



PREVENTING TYPE 2 DIABETES

A guide to refer your patients with prediabetes
to an evidence-based diabetes prevention program

Preventing diabetes: Making a difference by linking the clinic with the community.

In the average primary care practice, it's likely that one-third of patients over age 18, and half over age 65, have prediabetes.

Use this guide to help your patients delay or prevent the onset of type 2 diabetes

Prediabetes is a health condition characterized by blood glucose levels that are higher than normal, but not high enough to be diagnosed as diabetes. Prediabetes increases the risk for type 2 diabetes, heart disease and stroke.

Prediabetes is treatable, but only about 10 percent of people who have it are aware that they do. Left untreated up to one-third of people with prediabetes will progress to diabetes within five years.

During that window of time your patients can benefit from a proven lifestyle change intervention that is part of the [National Diabetes Prevention Program](#) (National DPP) led by the Centers for Disease Control and Prevention (CDC).

As part of the National DPP, the American Medical Association (AMA) and the CDC are collaborating to create tools and resources that care teams can use to identify patients with prediabetes, and refer eligible patients to in-person or online diabetes prevention programs.

Physicians and care teams from a diverse group of practices helped the AMA and the CDC create the tools in this guide, and have used them in their own practices to:

- o Screen and identify patients for prediabetes
- o Refer patients to diabetes prevention programs
- o Create feedback loops, linking the patient's progress in the diabetes prevention program back to the practice

Part of a national movement

To achieve CDC recognition as part of the National DPP, programs must provide evidence they are following a CDC-approved curriculum and achieving meaningful results with patients. These programs are based on research showing that a year-long, structured lifestyle change intervention reduced the incidence of diabetes by 58 percent among adults with prediabetes and by 71 percent in those aged 60 years or older.

These programs are successful in part because they require only moderate weight loss to achieve preventive health benefits. Weight loss of 5 to 7 percent of body weight—10 to 14 pounds for a person weighing 200 pounds—led to the results mentioned above.

The AMA and the CDC are promoting these diabetes prevention programs because they are one of the most effective ways to help physicians prevent or delay type 2 diabetes in high-risk patients.

Use this implementation guide and its tools to help identify and refer patients with prediabetes to a diabetes prevention program that is part of the CDC's National DPP.



Prevent Diabetes **STAT** | Screen / Test / Act Today™



Overview of guide tools

Resource	Purpose
Engage clinicians	
You can prevent type 2 diabetes Health care provider fact sheet	Provides a brief overview of the evidence-based diabetes prevention program and a rationale for engaging with the program, such as improved patient outcomes. Also assists clinicians in advocating to their colleagues and leaders about the value of incorporating diabetes prevention screening and referral into their practices.
Engage patients	
Diabetes Risk Assessments CDC and American Diabetes Association (ADA) questionnaires	Offers an educational opportunity for patients to learn about their risk for prediabetes, and help physicians and care teams identify their patients at great risk.
Promoting prediabetes awareness to your patients 8" x 11" poster)	Helps practices increase patient awareness of prediabetes to pave the way for conversations with patients about screening and referral.
Are you at risk for type 2 diabetes? Patient handout	For use by physician practices in patient waiting areas to increase patient awareness and pave the way for conversations with patients about screening and referral.
So you have prediabetes ... now what? Patient handout	For use by physician practices in the exam room after screening has revealed that a patient has prediabetes. Helps the patient leave the office visit with concrete information for later reference.
Sample "Patient letter/email and phone script"	Enables physician practices to conduct efficient follow-up and referral with patients who have been identified as having prediabetes, informing them of their prediabetes status and referral to an evidence-based diabetes prevention program.
Incorporate screening, testing and referral into practice	
M.A.P. to diabetes prevention for your practice One-page overview	Offers practices a one-page roadmap to applying the elements of the diabetes prevention screening and referral guide.
Patient flow process Infographic	Provides a high-level overview of how office staff can facilitate point-of-care identification.
Point-of-care prediabetes identification algorithm Infographic and narrative	With a graphic on one side, and narrative on other, the document offers practices an option to adapt/ incorporate a prediabetes screening and referral process into their workflow.
Retrospective prediabetes identification algorithm Infographic and narrative	With a graphic on one side, and narrative on other, the document offers practices an option to adapt/ incorporate an identification and referral process into their electronic health records and generate a registry of patients at risk for type 2 diabetes.
Sample patient referral form/table for calculating body mass index	Makes the referral process easier for practices, helps engage the patient (particularly if they sign the optional patient signature box) and prepares diabetes prevention program providers to engage with the patient as well.
Commonly used CPT and ICD codes Table	Enables physician practices to obtain reimbursement for prediabetes screening.
Connect your clinic with diabetes prevention programs	
Link to sample "Business Associate Agreement" on AMA's website	Provides link to template agreement some practices have used to share information with diabetes prevention program providers.

Additional information

AMA diabetes prevention initiative

preventdiabetesstat.org

Learn more about the AMA's commitment to preventing type 2 diabetes.

Centers for Disease Control and Prevention's National Diabetes Prevention Program

cdc.gov/diabetes/prevention

Visit this site for detailed information about the CDC's National Diabetes Prevention Program.

National Diabetes Education Program

ndep.nih.gov/am-i-at-risk/

Find educational resources about preventing diabetes for you and your patients.

How does a diabetes prevention program work?

Diabetes prevention programs that are part of the National DPP use lifestyle change interventions that target improving diet, increasing physical activity and achieving moderate weight loss.

The goal for each participant is to lose $\geq 5\%$ of body weight by:

- o Progressively reducing dietary intake of calories and fat through improved food choices
- o Gradually increasing moderate physical activity (e.g., brisk walking) to ≥ 150 minutes per week
- o Developing behavioral problem-solving and coping skills

Features include:

- o A year-long structured program (in-person group, online or distance learning) consisting of:
 - An initial six-month phase offering at least 16 sessions over 16–24 weeks
 - A second six-month phase offering at least one session a month (at least six sessions)
- o Facilitation by a trained lifestyle coach
- o Use of a CDC-approved curriculum
- o Regular opportunities for direct interaction between the lifestyle coach and participants
- o An emphasis on behavior modification, managing stress and peer support

Who is eligible for referral to a diabetes prevention program?

To be eligible for referral, patients must:

- o Be at least 18 years old **and**
- o Be overweight (Body Mass Index (BMI) $\geq 24^*$; ≥ 22 if Asian) **and**
- o Have a blood test result in the prediabetes range within the past year:
 - Hemoglobin A1C: 5.7–6.4% **or**
 - Fasting plasma glucose: 100–125 mg/dL **or**
 - Two-hour plasma glucose (after a 75 gm glucose load): 140–199 mg/dL **or**
- o Be previously diagnosed with gestational diabetes and
- o Have no previous diagnosis of diabetes

Physicians and other health care providers should also use their independent judgment when referring to a diabetes prevention program.

*These BMI levels reflect eligibility for the National DPP as noted in the [CDC Diabetes Prevention Recognition Program Standards and Operating Procedures](#). The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.



Prevent Diabetes **STAT** | Screen / Test / Act Today™



How can patients find a diabetes prevention program near them?

Diabetes prevention programs are available in varied locations such as local YMCAs, wellness centers, faith-based organizations and worksites—as well as in health care facilities. Online versions are also available. Visit cdc.gov/diabetes/prevention/recognition/registry.htm#program to find a program that is part of the CDC's National DPP recognition program.

Does health insurance cover patient participation in a diabetes prevention program?

A growing number of private health insurers offer coverage for patient participation in diabetes prevention programs. Several employers include coverage as part of workplace wellness programs. Costs for a full year of program participation are approximately \$400–\$500. Some program providers offer monthly payment plans and discounts based on ability to pay. The AMA and the CDC continue to advocate for public and private insurance coverage of the diabetes prevention program.

How do I code for prediabetes screening?

Depending on the type of office visit, practices can use several CPT and ICD codes to bill for prediabetes screening and counseling. A list of commonly used [CPT and ICD codes](#) is included in this guide.

Feedback from diabetes prevention program to referring clinicians

Most programs send reports of participant progress to referring clinicians after the eighth and 16th group sessions. In addition, participants in the program complete periodic self-evaluations that referring clinicians can request directly from patients.

Sending patient information to a diabetes prevention program provider

Business Associate Agreement

Under the U.S. Health Insurance Portability and Accountability Act of 1996 (HIPAA), a HIPAA Business Associate Agreement (BAA) is a contract that protects personal health information in accordance with HIPAA guidelines. Some physician practices may want to explore whether a BAA is needed to exchange information with a diabetes prevention program. (Link to a [“Business Associates Agreement”](#) template on AMA's website.)

Engage clinicians



You can prevent type 2 diabetes

Test your patients for prediabetes and refer those at risk to an evidence-based diabetes prevention program

You likely know which of your patients is at high risk for type 2 diabetes. Until now you may not have had a resource to help them stop the progression from prediabetes to diabetes. Now, you do.

The American Medical Association and the Centers for Disease Control and Prevention (CDC) have created a toolkit that can help physician practices screen and refer patients to evidence-based diabetes prevention programs without adding a burden to your practice. Visit **preventdiabetesstat.org** to learn more.

- o Progression from prediabetes to diabetes can take as little as five years.
- o During that window of time, your patients can benefit from a proven intervention that is part of the CDC's National Diabetes Prevention Program (National DPP).
- o Counsel your patients that prediabetes is a potentially reversible condition, and one that you can help them manage effectively by:
 - Screening and Identifying patients for prediabetes
 - Referring them to a program that is part of the CDC's National DPP

This program is evidence-based

- o The diabetes prevention program is a lifestyle intervention based on research funded by the National Institutes of Health that showed, among those with prediabetes, a 58 percent reduction in the number of new cases of diabetes overall, and a 71 percent reduction in new cases for those over age 60.
- o These results were achieved through reducing calories, increasing physical activity, and a weight loss of just 5 to 7 percent of body weight—10 to 14 pounds for a person weighing 200 pounds.*
- o Based on strong evidence of effectiveness in reducing new-onset diabetes, the Community Preventive Services Task Force (thecommunityguide.org) now recommends combined diet and physical activity promotion programs like the National DPP, for people at increased risk of type 2 diabetes.

Program overview

- o The program empowers patients with prediabetes to take charge of their health and well-being.
- o Participants meet in groups with a trained lifestyle coach for 16 weekly sessions and 6–8 monthly follow-up sessions.
- o These are NOT exercise classes. At these sessions patients learn ways to incorporate healthier eating and moderate physical activity, as well as problem-solving, stress-reduction and coping skills into their daily lives.

See next page to determine which of your patients is eligible for the diabetes prevention program.

In the average primary care practice it's likely one-third of patients over age 18, and half over age 65, have prediabetes.

* Visit **<http://diabetes.niddk.nih.gov/dm/pubs/preventionprogram>** to learn more about this research.



Locating a program

- o Programs are offered in varied locations such as local YMCAs, community centers, faith-based organizations, hospitals and worksites, and are also available online.
- o Find a program for your patients at **cdc.gov/diabetes/prevention**.

Eligibility for the diabetes prevention program

A. Inclusion criteria:

- Current age ≥ 18 years **and**
- Most recent BMI $\geq 24^*$ (≥ 22 if Asian) **and**
- A positive lab test result within previous 12 months:
 - o HbA1C 5.7–6.4% (LOINC code 4548-4) **or**
 - o FPG 100–125 mg/dL (LOINC code 1558-6) **or**
 - o OGTT 140–199 mg/dL (LOINC code 62856-0) **or**
- History of gestational diabetes (ICD-9: V12.21)

B. Exclusion criteria:

- Current diagnosis of diabetes (ICD-9: 250.xx) **or**
- Current Insulin use

Consider referring eligible patients:

- o At the time of an office visit, and/or
- o By generating a list of eligible patients from your electronic health record using a structured query

Physicians and other health care providers should also use their independent judgment when referring to a diabetes prevention program.

*These BMI levels reflect eligibility for the National DPP as noted in the CDC Diabetes Prevention Recognition Program Standards and Operating Procedures. The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.



Prevent Diabetes **STAT** | Screen / Test / Act Today™



The American Medical Association and the Centers for Disease Control are supporting physicians, care teams and patients to prevent diabetes.

**Engage
patients**

Patient risk assessment

ARE YOU AT RISK FOR

TYPE 2 DIABETES?



Diabetes Risk Test

1 How old are you?

- Less than 40 years (0 points)
- 40—49 years (1 point)
- 50—59 years (2 points)
- 60 years or older (3 points)

Write your score in the box.

2 Are you a man or a woman?

- Man (1 point) Woman (0 points)

3 If you are a woman, have you ever been diagnosed with gestational diabetes?

- Yes (1 point) No (0 points)

4 Do you have a mother, father, sister, or brother with diabetes?

- Yes (1 point) No (0 points)

5 Have you ever been diagnosed with high blood pressure?

- Yes (1 point) No (0 points)

6 Are you physically active?

- Yes (0 points) No (1 point)

7 What is your weight status? (see chart at right)

Height	Weight (lbs.)		
4' 10"	119-142	143-190	191+
4' 11"	124-147	148-197	198+
5' 0"	128-152	153-203	204+
5' 1"	132-157	158-210	211+
5' 2"	136-163	164-217	218+
5' 3"	141-168	169-224	225+
5' 4"	145-173	174-231	232+
5' 5"	150-179	180-239	240+
5' 6"	155-185	186-246	247+
5' 7"	159-190	191-254	255+
5' 8"	164-196	197-261	262+
5' 9"	169-202	203-269	270+
5' 10"	174-208	209-277	278+
5' 11"	179-214	215-285	286+
6' 0"	184-220	221-293	294+
6' 1"	189-226	227-301	302+
6' 2"	194-232	233-310	311+
6' 3"	200-239	240-318	319+
6' 4"	205-245	246-327	328+

(1 Point) (2 Points) (3 Points)

You weigh less than the amount in the left column (0 points)

If you scored 5 or higher:

You are at increased risk for having type 2 diabetes. However, only your doctor can tell for sure if you do have type 2 diabetes or prediabetes (a condition that precedes type 2 diabetes in which blood glucose levels are higher than normal). Talk to your doctor to see if additional testing is needed.

Add up your score.

Type 2 diabetes is more common in African Americans, Hispanics/Latinos, American Indians, and Asian Americans and Pacific Islanders.

For more information, visit us at www.diabetes.org or call 1-800-DIABETES



Visit us on Facebook
[Facebook.com/AmericanDiabetesAssociation](https://www.facebook.com/AmericanDiabetesAssociation)



Lower Your Risk

The good news is that you can manage your risk for type 2 diabetes. Small steps make a big difference and can help you live a longer, healthier life.

If you are at high risk, your first step is to see your doctor to see if additional testing is needed.

Visit diabetes.org or call 1-800-DIABETES for information, tips on getting started, and ideas for simple, small steps you can take to help lower your risk.

Adapted from Bang et al., Ann Intern Med 151:775-783, 2009.
Original algorithm was validated without gestational diabetes as part of the model.

CDC Prediabetes Screening Test



COULD YOU HAVE PREDIABETES?

Prediabetes means your blood glucose (sugar) is higher than normal, but not yet diabetes. Diabetes is a serious disease that can cause heart attack, stroke, blindness, kidney failure, or loss of feet or legs. Type 2 diabetes can be delayed or prevented in people with prediabetes through effective lifestyle programs. Take the first step. Find out your risk for prediabetes.

TAKE THE TEST—KNOW YOUR SCORE!

Answer these seven simple questions. For each "Yes" answer, add the number of points listed. All "No" answers are 0 points.

Yes	No
1	0
1	0
1	0
5	0
5	0
5	0
9	0

Are you a woman who has had a baby weighing more than 9 pounds at birth?

Do you have a sister or brother with diabetes?

Do you have a parent with diabetes?

Find your height on the chart. Do you weigh as much as or more than the weight listed for your height?

Are you younger than 65 years of age and get little or no exercise in a typical day?

Are you between 45 and 64 years of age?

Are you 65 years of age or older?

Add your score and check the back of this page to see what it means.

AT-RISK WEIGHT CHART

Height	Weight Pounds	Height	Weight Pounds
4'10"	129	5'7"	172
4'11"	133	5'8"	177
5'0"	138	5'9"	182
5'1"	143	5'10"	188
5'2"	147	5'11"	193
5'3"	152	6'0"	199
5'4"	157	6'1"	204
5'5"	162	6'2"	210
5'6"	167	6'3"	216
		6'4"	221

National Center for Chronic Disease Prevention and Health Promotion
Division of Diabetes Translation



IF YOUR SCORE IS 3 TO 8 POINTS

This means your risk is probably low for having prediabetes now. Keep your risk low. If you're overweight, lose weight. Be active most days, and don't use tobacco. Eat low-fat meals with fruits, vegetables, and whole-grain foods. If you have high cholesterol or high blood pressure, talk to your health care provider about your risk for type 2 diabetes.

IF YOUR SCORE IS 9 OR MORE POINTS

This means your risk is high for having prediabetes now. Please make an appointment with your health care provider soon.

HOW CAN I GET TESTED FOR PREDIABETES?

Individual or group health insurance: See your health care provider. If you don't have a provider, ask your insurance company about providers who take your insurance. Deductibles and copays may apply.

Medicaid: See your health care provider. If you don't have a provider, contact a state Medicaid office or contact your local health department.

Medicare: See your health care provider. Medicare will pay the cost of testing if the provider has a reason for testing. If you don't have a provider, contact your local health department.



www.cdc.gov/diabetes

86 MILLION AMERICAN ADULTS

have prediabetes

You could be one of them.

Having prediabetes means you are at increased risk for developing serious health problems such as type 2 diabetes, stroke and heart disease.

You could have prediabetes if you have:

- High cholesterol **or**
- High blood pressure **or**
- A parent, brother or sister with diabetes

Your risk goes up if you are also overweight, and/or over age 45.

If you have prediabetes, we can help!

Ask your doctor how you can stop diabetes before it starts.



Prevent Diabetes **STAT** | Screen / Test / Act Today™



The American Medical Association and the Centers for Disease Control are supporting physicians, care teams and patients to prevent diabetes.

Are you at risk for prediabetes?



1 in 3 U.S. adults has prediabetes. Most don't know it. Are you at risk?

You may have prediabetes and be at risk for type 2 diabetes if you:

- o Are 45 years of age or older
- o Are overweight
- o Have a family history of type 2 diabetes
- o Have high blood pressure
- o Are physically active fewer than three times per week
- o Ever had diabetes while pregnant (gestational diabetes) or gave birth to a baby that weighed more than 9 pounds

Prediabetes can lead to serious health problems

Having prediabetes means your blood glucose (sugar) level is higher than normal, but not high enough to be diagnosed as diabetes. But, nearly 90 percent of adults who have prediabetes don't know they have it.

If you have prediabetes and don't lose weight or increase your physical activity, you could develop type 2 diabetes within five years. Type 2 diabetes is a serious condition that can lead to health issues such as heart attack, stroke, blindness, kidney failure, or loss of toes, feet or legs.

What can you do?

- o Talk to your doctor about your risk of having prediabetes.

Here's the good news

If you have prediabetes, your doctor may refer you to a proven lifestyle change program that can help you prevent or delay getting type 2 diabetes.

The National Diabetes Prevention Program can help!

The National Diabetes Prevention Program (National DPP) uses a program that is proven to prevent or delay type 2 diabetes, and will help you lower your risk by improving your food choices and increasing physical activity.

How does it work? As part of a group in your community or online, you will work with a trained lifestyle coach to learn the skills you need to make lasting lifestyle changes. You will learn to eat healthy, add physical activity to your life, manage stress, stay motivated and solve problems that can get in the way of healthy changes.

Features

- o Trained coach to guide and encourage you
- o In-person or online
- o CDC-approved program
- o Support from others working on the same goals as you
- o Skills to help you lose weight, be more physically active and manage stress
- o Some insurance companies will cover

What participants are saying ...

"I love having a lifestyle coach. She has given us great information, helped me stay on track and stay positive!"
—Bruce

"I'm so excited because I went to the doctor last week and all of my numbers were down and I officially no longer have prediabetes."

—Vivien

Now is the time to take charge of your health and make a change! Ask your doctor or nurse.

So you have prediabetes ... now what?



Prediabetes means your blood glucose (sugar) level is higher than normal, but not high enough to be diagnosed as diabetes. This condition raises your risk of type 2 diabetes, stroke and heart disease.

What can you do about it?

The good news is that there's a program that can help you.

The National Diabetes Prevention Program, led by the Centers for Disease Control and Prevention (CDC), uses a method proven to prevent or delay type 2 diabetes.

By improving food choices and increasing physical activity, your goal will be to lose 5 to 7 percent of your body weight—that is 10 to 14 pounds for a person weighing 200 pounds.

These lifestyle changes can cut your risk of developing type 2 diabetes by more than half.

How does the program work?

As part of a group, you will work with a trained diabetes prevention coach and other participants to learn the skills you need to make lasting lifestyle changes. You will learn to eat healthy, add physical activity to your life, manage stress, stay motivated and solve problems that can get in the way of healthy changes.

The program lasts one year, with 16 sessions taking place about once a week and six to eight more sessions meeting once a month. By going through the program with others who have prediabetes you can celebrate each other's successes and work together to overcome challenges.

Some insurance plans will cover the cost of the program. Check with your insurance provider to see if it is covered. Also, some places that provide the program will adjust the fee you pay based on your income.

Why should you act now?

Without weight loss and moderate physical activity, many people with prediabetes will develop type 2 diabetes within five years. Type 2 diabetes is a serious condition that can lead to health issues such as heart attack, stroke, blindness, kidney failure, or loss of toes, feet or legs. **NOW is the time to take charge of your health and make a change.**

Features of the program:

- o A trained coach to guide and encourage you
- o A CDC-approved program
- o Group support
- o Skills to help you lose weight, be more physically active and manage stress

What participants are saying ...

"I love having a lifestyle coach. She has given us great information, helped me stay on track and stay positive!"

—Bruce

"I'm so excited because I went to the doctor last week and all of my numbers were down and I officially no longer have prediabetes."

—Vivien

Sign up today for a program near you!

To find a program in our area that is part of the National Diabetes Prevention Program, visit cdc.gov/diabetes/prevention.



Letter template

Use/adapt these templates to conduct efficient follow-up and referral with patients who have been identified as having prediabetes

<<YOUR LETTERHEAD>>

<<ADDRESS>>

<<PHONE NUMBER>>

<<DATE>>

<<PATIENT NAME>>

<<PATIENT ADDRESS>>

Dr. Mr./Mrs. <<PATIENT LAST NAME>>,

Thank you for being a patient of the <<PRACTICE NAME HERE>>. We are writing to tell you about a service to help make your health better.

Based on our review of your medical chart, you have a condition known as prediabetes. This means your blood sugar is higher than normal, which increases your risk of developing serious health problems including type 2 diabetes, as well as heart disease and stroke.

We have some good news. Our office wants you to know that you may be eligible for a diabetes prevention program run by our partners, <<NAME OF PROGRAM PROVIDER>>. This program is proven to reduce your risk of developing diabetes and other health problems.

We have sent a referral to <<NAME OF PROGRAM PROVIDER>> and someone will call you to discuss the program, answer any questions you may have and, if you are interested, enroll you in the program.

Please feel free to give <<NAME OF PROGRAM PROVIDER>> a call at <<PHONE NUMBER>>.

–OR–

We have sent a referral to <<NAME OF PROGRAM PROVIDER>> and we urge you to call <<PHONE NUMBER>> to learn more about the program and enroll.

We hope you will take advantage of this program, which can help prevent you from developing serious health problems.

Sincerely,

Dr. <<PHYSICIAN LAST NAME>>



Sample “Talking points” for phone outreach

- o Hello <<PATIENT NAME>>.
- o I am calling from <<PRACTICE NAME HERE>>.
- o I'm calling to tell you about a program we'd like you to consider, to help you prevent some serious health problems.
- o Based on our review of your medical chart, you have a condition known as prediabetes. This means your blood sugar is higher than normal, which makes you more likely to develop serious health problems including type 2 diabetes, stroke and heart disease.
- o We have some good news, too.
- o You may be eligible for a diabetes prevention program run by our partners, <<NAME OF PROGRAM PROVIDER>>.
 - Their program is based on research proven to reduce your risk of developing diabetes and other health problems.

Option A

- o We have sent a referral to <<NAME OF PROGRAM PROVIDER >> and someone will call you to discuss the program, answer any questions you may have and, if you are interested, enroll you in the program.
- o Please feel free to give <<NAME OF PROGRAM PROVIDER>> a call at <<PHONE NUMBER>>.
- o Do you have any questions for me?
- o Thank you for your time and be well.

Option B

- o We have sent a referral to <<NAME OF PROGRAM PROVIDER>> and we urge you to call <<PHONE NUMBER>> to learn more about the program and enroll.
- o We hope you will take advantage of this program, which can help prevent you from developing serious health problems.
- o Do you have any questions for me?
- o Thank you for your time and be well.

**Incorporate
screening, testing
and referral into
practice**

M.A.P. (Measure, Act, Partner)

THE M.A.P. (Measure, Act, Partner) to prevent type 2 diabetes—physicians and care teams can use this document to determine roles and responsibilities for identifying adult patients with prediabetes and referring to community-based diabetes prevention programs. “Point-of-Care” and “Retrospective” methods may be used together or alone.

Choose and check what works best for your practice

Step 1: Measure	When	Who	How (draw from AMA-CDC tools)
Point-of-care method o Assess risk for prediabetes during routine office visit o Test and evaluate blood glucose level based on risk status	o At the front desk o During vital signs	o Receptionist o Medical assistant o Nurse o Physician o Other _____	o Provide “Are you at risk for prediabetes?” patient education handout in waiting area o Use/adapt “Patient flow process” tool o Use CDC or ADA risk assessment questionnaire at check-in o Display 8 x 11” patient-facing poster promoting prediabetes awareness to your patients o Use/adapt “Point-of-care algorithm”
Retrospective method o Query EHR to identify patients with BMI ≥24* and blood glucose level in the prediabetes range	o Every 6–12 months	o Health IT staff o Other _____	o Use/adapt “Retrospective algorithm”
Step 2: Act			
Point-of-care method o Counsel patient re: prediabetes and treatment options during office visit o Refer patient to diabetes prevention program o Share patient contact info with program provider**	o During the visit	o Medical assistant o Nurse o Physician o Other _____	o Advise patient using “So you have prediabetes ... now what?” handout o Use/adapt “Health care practitioner referral form” o Refer to “Commonly used CPT and ICD codes”
Retrospective method o Inform patient of prediabetes status via mail, email or phone call o Make patient aware of referral and info sharing with program provider o Refer patient to diabetes prevention program o Share patient contact info with program provider**	o Contact patient soon after EHR query	o Health IT staff o Medical assistant (for phone calls) o Other _____	o Use/adapt “Patient letter/phone call” template o Use/adapt “Health care practitioner referral form” for making individual referrals o Use/adapt “ Business Associate Agreement ” template on AMA's website if needed
Step 3: Partner			
With diabetes prevention programs o Engage and communicate with your local diabetes prevention program o Establish process to receive feedback from program about your patients’ participation	o Establish contact before making 1st referral	o Medical assistant o Nurse o Physician o Other _____	Use/adapt “ Business Associate Agreement ” template on AMA's website if needed Refer to “Commonly used CPT and ICD codes”
With patients o Explore motivating factors important to the patient o At follow-up visit, order/review blood tests to determine impact of program and reinforce continued program participation o Discuss program feedback with patient and integrate into care plan	o During office visit o Other _____	o Office manager o Other _____	o Advise patient using “So you have prediabetes ... now what?” handout and provide CDC physical activity fact sheet www.cdc.gov/physicalactivity

*These BMI levels reflect eligibility for the National DPP as noted in the [CDC Diabetes Prevention Recognition Program Standards and Operating Procedures](#). The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥23 for Asian Americans and ≥25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

Following the M.A.P. for Preventing Type 2 Diabetes can help your practice achieve [Patient Centered Medical Home](#) (PCMH) recognition, as well as [Meaningful Use](#) of your electronic medical record. (Supports PCMH recognition via Standard 4: Self-Care Support, B. Provide Referrals to Community Resources (3 points), *NCQA Facilitating PCMH Recognition, 2011.*)

* * To share patient contact information with a diabetes prevention program, you may need a Business Associate Agreement (BAA).

The American Medical Association and the Centers for Disease Control and Prevention have created a tool kit that can help physician practices screen and refer patients to evidence-based diabetes prevention programs. Visit preventdiabetesstat.org to learn more. Physicians and other health care providers should also use their independent judgment when referring to a diabetes prevention program.

Sample patient flow process

MEASURE

CHECK-IN

- o If age ≥ 18 and patient does not have diabetes, provide CDC Prediabetes Screening Test or ADA Diabetes Risk Test
- o Patient completes test and returns it
- o Insert completed test in paper chart or note risk score in EMR



ROOMING/VITALS

- o Calculate BMI (using table) and review diabetes risk score
- o If elevated risk score or history of GDM, flag for possible referral



ACT

EXAM/CONSULT

- o Follow "Point-of-care prediabetes identification algorithm"
- o Determine if patient has prediabetes and BMI $\geq 24^*$ (≥ 22 for Asians) or a history of GDM
- o Advise re: diet/exercise and determine willingness to participate in a diabetes prevention program
- o If patient agrees to participate, proceed with referral



PARTNER

REFERRAL

- o Complete and submit referral form



FOLLOW UP

- o Contact patient and troubleshoot issues with enrollment or participation

*These BMI levels reflect eligibility for the National DPP as noted in the [CDC Diabetes Prevention Recognition Program Standards and Operating Procedures](#). The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

Point-of-care prediabetes identification

MEASURE

If patient is age ≥ 18 and does not have diabetes, provide self-screening test (CDC Prediabetes Screening Test or ADA Diabetes Risk Test)
If self-screening test reveals risk, proceed to next step

Review medical record to determine if BMI $\geq 24^*$ (≥ 22 if Asian) or history of GDM**

YES

NO

If no: Patient does not currently meet program eligibility requirements

Determine if a HbA1C, FPG or OGTT was performed in the past 12 months

YES

NO

Order one of the tests below:

- o Hemoglobin A1C (HbA1C)
- o Fasting plasma glucose (FPG)
- o Oral glucose tolerance test (OGTT)

RESULTS

Diagnostic test	Normal	Prediabetes	Diabetes
HbA1C(%)	< 5.7	5.7–6.4	≥ 6.5
Fasting plasma glucose (mg/dL)	< 100	100–125	≥ 126
Oral glucose tolerance test (mg/dL)	<140	140–199	≥ 200

ACT

Encourage patient to maintain a healthy lifestyle.

Continue with exam/consult. Retest within three years of last negative test.

Refer to diabetes prevention program, provide brochure.

Consider retesting annually to check for diabetes onset.

Confirm diagnosis; retest if necessary.

Counsel patient re: diagnosis.

Initiate therapy.

PARTNER

Communicate with your local diabetes prevention program.

Contact patient and troubleshoot issues with enrollment or participation. At the next visit, ask patient about progress and encourage continued participation in the program.

Adapted from: New York State Department of Health. New York State Diabetes Prevention Program (NYS DDP) prediabetes identification and intervention algorithm. New York: NY Department of Health; 2012.

* These BMI levels reflect eligibility for the National DPP as noted in the [CDC Diabetes Prevention Recognition Program Standards and Operating Procedures](#). The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

** History of GDM = eligibility for diabetes prevention program

Referring patients to a diabetes prevention program

Method 1:

Point-of-care identification and referral

Download and display patient materials

Download and print the practice and patient resources included in this guide in advance of patient visits, so your office can have them available in the waiting room or during consult.

Measure

Step 1 – During checkin: If age ≥ 18 and patient does not have diabetes, give him/her the “[CDC Prediabetes Screening Test](#)” or American Diabetes Association “[Diabetes Risk Test](#)”. After patient completes the test and returns it, insert completed test in the paper chart or note risk score in the electronic medical record (EMR). Screening test can also be mailed to patient along with other pre-visit materials.

Step 2 – During rooming/vitals: Calculate the patient’s [body mass index](#). Most EMRs can calculate BMI automatically. Review the patient’s diabetes risk score and if elevated (≥ 5 on ADA test or ≥ 9 on CDC test), flag for possible referral.

Step 3 – During exam/consult: Follow the “Point-of-care prediabetes identification algorithm” to determine if patient has prediabetes.

If the blood test results **do not** indicate prediabetes:

Encourage the patient to maintain healthy lifestyle choices. Continue with exam/consult.

Act

A. If the patient screens positive for prediabetes and has BMI $< 24^*$ (< 22 if Asian):

- Introduce the topic of prediabetes by briefly explaining what it is and its relation to diabetes (use the handout “[So you have prediabetes ... now what?](#)”). Review the patient’s own risk factors.
- Emphasize the importance of prevention, including healthy eating, increased physical activity, and the elimination of risky drinking and tobacco use. (Visit the National Diabetes Education Program’s GAME PLAN to Prevent Type 2 Diabetes for additional patient resources.)

B. If the patient screens positive for prediabetes and has BMI ≥ 24 (≥ 22 if Asian):

- Follow the steps in “A” above, discuss the value of participating in a diabetes prevention program, and determine the patient’s willingness to let you refer him/her to a program.
- If the patient agrees, complete and send the [referral form](#) to a community-based or online diabetes prevention program, depending on patient preference.
- If patient declines, offer him/her a program handout and re-evaluate risk factors at next clinic visit.

Step 4 – Referral to diabetes prevention program: Most diabetes prevention programs are configured to receive referrals via conventional fax (over a phone line) or secure email. Complete the [referral form](#) and submit to a program as follows:

A. If using a paper referral form, send via fax (over a phone line) or scan and email

B. If the referral form is embedded in your EMR, either fax (over a phone line) or email using the EMR

- Some diabetes prevention programs can also receive an e-fax (over the Internet)

Physicians and other health care providers should also use their independent judgment when referring to a diabetes prevention program.

Partner

Step 5 – Follow-up with patient: Contact patient and troubleshoot issues with enrollment or participation. At the next visit, ask patient about progress and encourage continued participation in the program.

*These BMI levels reflect eligibility for the National DPP as noted in the [CDC Diabetes Prevention Recognition Program Standards and Operating Procedures](#). The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

Retrospective prediabetes identification

MEASURE

Query EMR or patient database every 6–12 months using the following criteria:

A. Inclusion criteria:

- Age ≥ 18 years **and**
- Most recent BMI $\geq 24^*$ (≥ 22 if Asian) **and**
- A positive lab test result within previous 12 months:
 - o HbA1C 5.7–6.4% (LOINC code 4548-4) **or**
 - o FPG 100–125 mg/dL (LOINC code 1558-6) **or**
 - o OGTT 140–199 mg/dL (LOINC code 62856-0) **or**
- History of gestational diabetes (ICD-9: V12.21)

B. Exclusion criteria:

- Current diagnosis of diabetes (ICD-9: 250.xx) **or**
- Current Insulin use



Generate a list of patient names with relevant information



ACT

Use the patient list to:

- A. Contact patients to inform of risk status, explain prediabetes, and share info on diabetes prevention programs, **and/or**
- B. Send patient info to diabetes prevention program provider
 - Program coordinator will contact patient directly, **and**
- C. Flag medical record for patient's next office visit



PARTNER

Discuss program participation at next visit

*These BMI levels reflect eligibility for the National DPP as noted in the [CDC Diabetes Prevention Recognition Program Standards and Operating Procedures](#). The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

Method 2:

Retrospective identification and referral

Step 1 – Query EMR or patient database

Measure

Query your EMR or patient database every 6–12 months using the following criteria:

A. Inclusion criteria:

- Age ≥ 18 years **and**
- BMI $\geq 24^*$ (≥ 22 if Asian) **and**
- A positive test result for prediabetes within the preceding 12 months:
 - o HbA1C 5.7–6.4% **or**
 - o Fasting plasma glucose 100–125 mg/dL **or**
 - o Oral glucose tolerance test 140–199 mg/dL **or**
- Clinically diagnosed gestational diabetes during a previous pregnancy

B. Exclusion criteria:

- Current diagnosis of diabetes **or**
- Current Insulin use

Generate a list of patient names and other information required to make referrals:

- Gender and birth date
- Email address
- Mailing address
- Phone number

Act

Step 2 – Referral to diabetes prevention program

- Contact patients via phone, email, [letter](#) or postcard to explain their prediabetes status and let them know about the diabetes prevention program.
- Send relevant patient information to your local (or online) diabetes prevention program coordinator and have him/her contact the patient directly (may require [Business Associate Agreement](#)).
- Flag patients' medical records for their next office visit.

Physicians and other health care providers should also use their independent judgment when referring to a diabetes prevention program.

Partner

During the next office visit, discuss diabetes prevention program participation:

- If the patient is participating, discuss program experience and encourage continued participation
- If the patient has declined to participate, stress the importance of lifestyle change and continue to encourage participation (use the handout "[So you have prediabetes ... now what?](#)")

*These BMI levels reflect eligibility for the National DPP as noted in the [CDC Diabetes Prevention Recognition Program Standards and Operating Procedures](#). The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

Health care practitioner referral form to a diabetes prevention program

Send to: Fax:

Email:

PATIENT INFORMATION		
First name	Address	
Last name		
Health insurance	City	
Gender <input type="checkbox"/> Male <input type="checkbox"/> Female	State	
Birth date (mm/dd/yy)	ZIP code	
Email	Phone	
By providing your information above, you authorize your health care practitioner to provide this information to a diabetes prevention program provider, who may in turn use this information to communicate with you regarding its diabetes prevention program.		
PRACTITIONER INFORMATION (COMPLETED BY HEALTH CARE PRACTITIONER)		
Physician/NP/PA	Address	
Practice contact	City	
Phone	State	
Fax	ZIP code	
SCREENING INFORMATION		
Body Mass Index (BMI)	Eligibility = $\geq 24^*$ (≥ 22 if Asian)	
Blood test (check one)	Eligible range	Test result (one only)
-- Hemoglobin A1C	5.7–6.4%	_____
-- Fasting Plasma Glucose	100–125 mg/dL	_____
-- 2-hour plasma glucose (75 gm OGTT)	140–199 mg/dL	_____
Date of blood test (mm/dd/yy):		
For Medicare requirements, I will maintain this signed original document in the patient's medical record.		
Date	Practitioner signature	
OPTIONAL	By signing this form, I authorize my physician to disclose my diabetes screening results to the (insert program/organization name here) for the purpose of determining my eligibility for the diabetes prevention program and conducting other activities as permitted by law.	
	I understand that I am not obligated to participate in this diabetes screening program and that this authorization is voluntary.	
OPTIONAL	I understand that I may revoke this authorization at any time by notifying my physician in writing.	
	Any revocation will not have an effect on actions taken before my physician received my written revocation.	
Date	Patient signature	

IMPORTANT WARNING: The documents accompanying this transmission contain confidential health information protected from unauthorized use or disclosure except as permitted by law. This information is intended only for the use of the individual or entity named above. The authorized recipient of this information is prohibited from disclosing this information to any other party unless permitted to do so by law or regulation. If you are not the intended recipient and have received this information in error, please notify the sender immediately for the return or destruction of these documents. Rev. 05/30/14

*These BMI levels reflect eligibility for the National DPP as noted in the [CDC Diabetes Prevention Recognition Program Standards and Operating Procedures](#). The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

Commonly Used CPT and ICD Codes

International Classification of Diseases (ICD)-9 and ICD-10 for prediabetes and diabetes screening			
ICD-10 code (effective 10-01-2015)	ICD-10 code description	ICD-9 code (effective through 9-30-2015)	ICD-9 code description
Z13.1	Encounter for screening for diabetes mellitus	V77.1	Diabetes screening
R73.09	Other abnormal glucose	790.29	Abnormal glucose
R73.01	Impaired fasting glucose	790.21	Impaired fasting glucose
R73.02	Impaired glucose tolerance (oral)	790.22	Impaired glucose tolerance (oral)
R73.9	Hyperglycemia, unspecified	790.29	Other abnormal glucose NOS
E66.01	Morbid obesity due to excess calories	278.01	Morbid Obesity
E66.09	Other obesity due to excess calories	278.00	Obesity (NOS)
E66.8	Other obesity	278.00	Obesity (NOS)
E66.9	Obesity, unspecified	278.00	Obesity (NOS)
E66.3	Overweight	278.02	Overweight
Z68.3x	Body mass indexes 30.0-39.9 (adult)	V85.30-V85.39	Body mass indexes 30.0-39.9 (adult)
Z68.4x	Body mass indexes ≥40.0 (adult)	V85.41-V85.45	Body mass indexes 30.0-39.9 (adult)

Current Procedural Terminology (CPT®) for diabetes screening tests			
CPT E/M codes for prevention-related office visits		CPT codes for office-based laboratory testing	
Preventive Visit New Patient Commercial/Medicaid	99381-99387	83036QW	Office-based Hemoglobin A1C testing
Preventive Visit Established Patient Commercial/Medicaid	99391-99397	82962	Office-based finger stick glucose testing
Annual Wellness Visit Initial Medicare	G0438		
Annual Wellness Visit Subsequent Medicare	G0439		

(Continued on next page)



Current Procedural Terminology (CPT®) for diabetes screening tests

CPT E/M codes for prevention-related office visits		CPT codes for office-based laboratory testing	
Individual Preventive Counseling* Commercial/Medicaid	99401 – Approx 15min 99402 – Approx 30min 99403 – Approx 45min 99404 – Approx 60min		
Face-to-Face Obesity	G0447 – 15 minutes		
Counseling for Obesity† Medicare			

These codes may be useful to report services/tests performed to screen for prediabetes and diabetes.

* Preventive codes 99381-99397 include counseling and cannot be combined with additional counseling codes. If significant risk factor reduction and/or behavior change counseling is provided during a problem-oriented encounter, additional preventive counseling may be billed. In this case, modifier 25 code may allow for payment for both services, although this may vary by payer. Reimbursement for this code is not guaranteed.

† Must be billed with an ICD code indicating a BMI of 30 or greater. Medicare does not allow billing for another service provided on the same day.



Preventing type 2 diabetes in at-risk patients

Help your patients find ways to prevent type 2 diabetes through education, screening and local referral programs.



AMA IN PARTNERSHIP WITH 

CME
CREDITS:
1.0

Namratha Kandula, MD, MPH
Director, Physician and Patient
Engagement, Improving Health
Outcomes, AMA

How will this module help me identify prediabetes and prevent the onset of diabetes?

- 1 Provide tools and resources on screening, testing and referral
- 2 Learn from practices that have successfully implemented prediabetes screening and education programs
- 3 Identify evidence-based prevention programs for patient referral
- 4 Get answers to commonly asked questions

Many physicians now spend less time delivering direct patient care. This is primarily due to increasing administrative responsibilities that are a result of regulatory pressures along with evolving payment and care delivery models. In the average primary care practice, up to one-third of patients age 18 and above – and up to half age 65 and above – could be at risk for prediabetes. Physicians and their care teams play an important role in diabetes prevention.

Preventing type 2 diabetes in at-risk patients

Release Date: June 2015

End Date: June 2019

Objectives

At the end of this activity, participants will be able to:

1. Define the medical condition of prediabetes and treatment options for prediabetes
2. Identify patients with prediabetes
3. Educate patients at-risk for type 2 diabetes
4. Determine roles and responsibilities regarding diabetes prevention and practice workflow
5. Refer patients with prediabetes to an evidence-based diabetes prevention program

Target Audience

This activity is designed to meet the educational needs of practicing physicians and their care teams.

Statement of Need

Eighty-six million adults in the United States have prediabetes, but 90 percent of them are undiagnosed.¹ Up to 30 percent of people with prediabetes will develop diabetes within five years.²⁻³ People with prediabetes also have an increased risk of heart disease and stroke.¹ Early and intensive lifestyle intervention can prevent or delay diabetes in at-risk patients²⁻¹⁷ and has also demonstrated secondary prevention of microvascular and macrovascular complications. Physicians and their care teams play an important role in diabetes prevention. This diabetes prevention module presents strategies to help physicians as well as practice staff educate patients about their risk for developing diabetes and refer at-risk patients to an evidence-based diabetes prevention program. This module also addresses the need for helping physicians determine roles and responsibilities and practice flow for diabetes prevention in a clinical setting.

Statement of Competency

This activity is designed to address the following ABMS/ACGME competencies: practice-based learning and improvement, interpersonal and communications skills, professionalism, systems-based practice, interdisciplinary teamwork, quality improvement and informatics.

Planning Committee

Rita LePard – CME Program Committee, AMA

Ellie Rajceovich, MPA – Practice Development Advisor, Professional Satisfaction and Practice Sustainability, AMA

Sam Reynolds, MBA – Director, Professional Satisfaction and Practice Sustainability, AMA

Christine Sinsky, MD – Vice President, Professional Satisfaction, American Medical Association and Internist, Medical Associates Clinic and Health Plans, Dubuque, IA

Krystal White, MBA – Program Administrator, Professional Satisfaction and Practice Sustainability, AMA

Author(s)

Namratha Kandula, MD, MPH – Director, Physician and Patient Engagement, Improving Health Outcomes, AMA

Faculty

Shahid A. Choudhry, PhD – Senior Program Manager, Physician and Patient Engagement, Improving Health Outcomes, AMA

Omar Hasan, MBBS, MPH – Vice President, Improving Health Outcomes, AMA

Christopher Holliday, PhD, MPH – Director, Population Health, Improving Health Outcomes, AMA

Namratha Kandula, MD, MPH – Director, Physician and Patient Engagement, Improving Health Outcomes, AMA

Mavis Prall, MSJ, MS – Director, Information and Engagement, Improving Health Outcomes, AMA

Vanessa Salcedo, MPH – Research Associate, Population Health, Improving Health Outcomes, AMA

Janet Williams, MA – Senior Program Manager, Population Health, Improving Health Outcomes, AMA

Matthew K. Wynia, MD, MPH – Director, Physician and Patient Engagement, Improving Health Outcomes, AMA

About the Professional Satisfaction, Practice Sustainability Group

The AMA Professional Satisfaction and Practice Sustainability group has been tasked with developing and promoting innovative strategies that create sustainable practices. Leveraging findings from the 2013 AMA/RAND Health study, “Factors affecting physician professional satisfaction and their implications for patient care, health systems and health policy,” and other research sources, the group developed a series of practice transformation strategies. Each has the potential to reduce or eliminate inefficiency in broader office-based physician practices and improve health outcomes, increase operational productivity and reduce health care costs.

About the Improving Health Outcomes Area

The AMA’s Improving Health Outcomes area is tackling two of the nation’s most prevalent issues: cardiovascular disease and type 2 diabetes. Beginning with a focus on risk factors for these conditions, the AMA is helping physicians and care teams to control high blood pressure and prevent diabetes—two disease burdens that cost the U.S. health care system more than 500 billion dollars annually. With work already underway to engage organized medicine, the private/public sector, the federal government and local communities, the AMA is adding its resources and skill in orchestrating effective collaborative efforts to help improve the health of the nation.

Disclosure Statement

The content of this activity does not relate to any product of a commercial interest as defined by the ACGME; therefore, neither the planners nor the faculty have relevant financial relationships to disclose.

Accreditation Statement

The American Medical Association is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

Credit Designation Statement

The American Medical Association designates this enduring material for a maximum of 1.0 *AMA PRA Category 1 Credit™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Claiming Your CME Credit

To claim *AMA PRA Category 1 Credit™*, you must 1) view the module content in its entirety; 2) successfully complete the quiz answering 4 out of 5 questions correctly and 3) complete the evaluation.

Media Types

This activity is available to learners through Internet and Print.

References

Centers for Disease Control and Prevention. *National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States, 2014*. Atlanta, GA; 2014. <http://www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf>

Knowler WC, Barrett-Connor E, Fowler SE, et al; Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*. 2002;346:393-403.

Tuomilehto J, Lindstrom J, Eriksson J, et al; Finnish Diabetes Prevention Study Group. Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *N Engl J Med*. 2001;344:1343-50.

Holman RR, Paul SK, Bethel MA, Matthews DR, Neil HAW. 10-year follow-up of intensive glucose control in type 2 diabetes. *N Engl J Med*. 2008;359:1577-89. doi:10.1056/NEJMoa0806470.

Nathan DM, Cleary PA, Backlund JY, et al; Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) Study Research Group. Intensive diabetes treatment and cardiovascular disease in patients with type 1 diabetes. *N Engl J Med*. 2005;353(25):2643-53.

The Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med*. 1993;329(14):977-86.

UK Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). *Lancet*. 1998;352(9131):837-53.

Herman WH, Hoerger TJ, Brandle M, et al; Diabetes Prevention Program Research Group. The cost-effectiveness of lifestyle modification or metformin in preventing type 2 diabetes in adults with impaired glucose tolerance. *Ann Intern Med*. 2005;142:323-32.

Ratner R, Goldberg R, Haffner S, et al.; Diabetes Prevention Program Research Group. Impact of intensive lifestyle and metformin therapy on cardiovascular disease risk factors in the Diabetes Prevention Program. *Diabetes Care*. 2005;28:888-94.

Jiang L, Manson SM, Beals J, et al; Special Diabetes Program for Indians Diabetes Prevention Demonstration Project. Translating the Diabetes Prevention Program into American Indian and Alaska Native communities:

results from the Special Diabetes Program for Indians Diabetes Prevention demonstration project. *Diabetes Care*. 2013;36(7):2027-34. doi: 10.2337/dc12-1250.

Gerstein HC, Santaguida P, Raina P, et al. Annual incidence and relative risk of diabetes in people with various categories of dysglycemia: a systematic overview and meta-analysis of prospective studies. *Diabetes Res Clin Pract*. 2007;78(3):305-12.

Ackermann RT, Finch EA, Brizendine E, Zhou H, Marrero DG. Translating the Diabetes Prevention Program into the community. The DEPLOY Pilot Study. *Am J Prev Med*. 2008;35(4):357-63.

Knowler WC, Fowler SE, Hamman RF, et al; Diabetes Prevention Program Research Group. 10-year follow-up of diabetes incidence and weight loss in the Diabetes Prevention Program Outcomes Study. *Lancet*. 2009;374(9702):1677-86.

Whittemore R. A systematic review of the translational research on the Diabetes Prevention Program. *Transl Behav Med*. 2011;1(3):480-91. doi:10.1007/s13142-011-0062-y.

Johnson M, Jones R, Freeman C, et al. Can diabetes prevention programmes be translated effectively into real-world settings and still deliver improved outcomes? A synthesis of evidence. *Diabet Med*. 2013;30(1):3-15.

Ma J, Yank V, Xiao L, et al. Translating the Diabetes Prevention Program lifestyle intervention for weight loss into primary care: a randomized trial. *JAMA Intern Med*. 2013;173(2):113-21.

Albright AL, Gregg EW. Preventing type 2 diabetes in communities across the U.S.: the National Diabetes Prevention Program. *Am J Prev Med*. 2013;44(4 Suppl 4):S346-51.

PCMH recognition via Standard 4: Self-Care Support, B. Provide Referrals to Community Resources (3 points), *NCQA Facilitating PCMH Recognition*, 2011.

American Medical Association. *PREVENTING TYPE 2 DIABETES: A guide to refer patients to the YMCA's Diabetes Prevention Program*. Chicago, IL: Improving Health Outcomes, American Medical Association; 2014.

Diabetes Prevention Program Research Group. Long-term safety, tolerability, and weight loss associated with metformin in the Diabetes Prevention Program Outcomes Study. *Diabetes Care*. 2012;35:731-7.

Lilly M, Godwin M. Treating prediabetes with metformin. *Can Fam Physician*. 2009;55:363-9.

American Diabetes Association. Prevention or delay of type 2 diabetes. In: Standards of Medical Care in Diabetes. *Diabetes Care*. 2015;38(Suppl. 1):S31-S32. doi: 10.2337/dc15-S008.



Introduction

What is prediabetes?

Prediabetes is a condition in which blood glucose or hemoglobin A1C (HbA1C) levels are higher than normal but not high enough to be classified as diabetes.¹ In the average primary care practice, up to one-third of patients age 18 and above—and up to half age 65 and above—could have prediabetes.¹



86 million
AMERICAN ADULTS
HAVE PREDIABETES



9 OUT OF 10 PEOPLE WITH PREDIABETES
DON'T KNOW THEY HAVE IT

Eighty-six million adults in the United States have prediabetes, but 90 percent of them don't know they have it!¹ Up to 30 percent of people with prediabetes will develop diabetes within five years.²⁻³ Importantly, people with prediabetes also have an increased risk of heart disease and stroke.¹

What can be done to stop progression to diabetes?

Early and intensive lifestyle intervention can prevent or delay diabetes in at-risk patients²⁻¹⁷ and has also demonstrated secondary prevention of microvascular and macrovascular complications.

Physicians and their care teams play an important role in diabetes prevention. This diabetes prevention module presents strategies to help physicians and practice staff educate patients about their risk for developing diabetes and refer at-risk patients to an evidence-based diabetes prevention program. This one-page document – [M.A.P. \(Measure, Act, Partner\)](#) – can help you and your team determine roles and responsibilities regarding diabetes prevention and your practice workflow.

DOWNLOAD [M.A.P. \(Measure, Act, Partner\)](#)

Five steps to help patients prevent diabetes

1. Create awareness
2. Identify patients with prediabetes
3. Educate at-risk patients
4. Refer patients to an evidence-based diabetes prevention program
5. Follow-up on weight loss progress

1

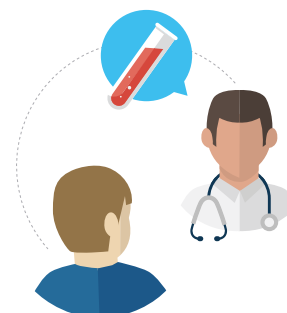
Create awareness

Among patients: Hang educational posters and distribute informational handouts, such as “Are you at risk for prediabetes?” in exam rooms or in waiting areas.

DOWNLOAD [Are you at risk for prediabetes?](#)

Among clinicians: Use this handout to raise awareness among colleagues and clinicians about the evidence-based diabetes prevention program and why it makes sense to screen and refer.

DOWNLOAD [You can prevent type 2 diabetes](#)



2

Identify patients with prediabetes

The most common blood tests used to identify people with prediabetes include a fasting plasma glucose or hemoglobin A1C (HbA1C).

DOWNLOAD [ICD and CPT codes for prediabetes and diabetes screening](#)

DIAGNOSTIC TEST ²	NORMAL	PREDIABETES	DIABETES
HbA1C (%)	< 5.7	5.7-6.4	≥ 6.5
Fasting plasma glucose (mg/dL)	< 100	100-125	≥ 126
	Encourage patient to maintain a healthy lifestyle.	Refer to diabetes prevention program, provide brochure.	Confirm diagnosis; retest if necessary.
	Continue with exam/consult. Retest within three years of last negative test.	Consider retesting annually to check for diabetes onset.	Counsel patient re: diagnosis. Initiate therapy.

Reprinted with permission from the American Medical Association.¹⁹

You can prospectively identify patients with prediabetes by having patients complete a [diabetes risk assessment](#) before their visit and by arranging for pre-visit lab testing before a planned care appointment ([see pre-visit planning module](#)). This will allow face-to-face engagement with the patient about the results at the visit.

You can also retrospectively identify patients by setting up a query in your electronic health record (EHR). Use the one-page infographic – Retrospective prediabetes identification – to set up a prediabetes registry using your EHR. Your patients with a BMI ≥ 24 kg/m² (≥ 22 for Asians) and blood glucose or HbA1C levels in the prediabetes range qualify for an evidence-based diabetes prevention program. (Read on to learn more about referring patients to this program.)*

* These BMI levels reflect eligibility for the National DPP as noted in the CDC Diabetes Prevention Recognition Program Standards and Operating Procedures. The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

DOWNLOAD [Retrospective prediabetes identification](#)

Q&A

What are the features of a diabetes prevention program?

Diabetes prevention programs emphasize behavior modification, managing stress and peer support. Some of the components are:

- A structured program of at least 16 sessions in the first six months, followed by monthly sessions for the next six months
- Facilitation by a trained lifestyle coach
- **Use of an evidence-based curriculum**

What is the evidence behind the diabetes prevention program?

The diabetes prevention program is a lifestyle intervention based on research funded by the National Institutes of Health that showed, among those with prediabetes, a 58 percent reduction in the number of new cases of diabetes overall, and a 71 percent reduction in new cases for those over age 60.² Researchers published the findings of the Diabetes Prevention Program (DPP) study in the February 7, 2002, issue of the *New England Journal of Medicine*. Additional studies²⁻¹⁷ have since been published showing the efficacy of the DPP.

Are diabetes prevention programs covered by insurance?

Currently, there is limited insurance coverage for diabetes prevention programs. However, coverage for diabetes prevention programs continues to grow. To determine if your patient has coverage for a diabetes prevention program, ask the patient to contact his or her insurance carrier.

Does metformin prevent diabetes in at-risk adults?

Pharmacological agents, such as metformin, α-glucosidase inhibitors, orlistat, and thiazolidinediones, have each been shown to decrease incident diabetes to various degrees. Metformin has the strongest evidence base and demonstrated long-term safety for diabetes prevention.²⁰ Although metformin is less effective than lifestyle modification for diabetes prevention, the DPP study^{2,21} found that metformin can reduce the risk of developing diabetes by 31 percent over three years. Lifestyle modification with diet and exercise is approximately twice as effective as metformin for preventing diabetes, especially in older patients. Metformin was shown to be most effective in preventing or delaying the development of type 2 diabetes in younger, heavier people with prediabetes. Metformin was also effective for lowering the risk of diabetes in women who have had gestational diabetes. Clinical guidelines recommend that metformin can be considered for diabetes prevention in people younger than 60 years who are at very high risk for progressing to diabetes, such as women with a history of gestational diabetes or obese individuals.²²

3

Educate patients at risk for diabetes

Focus your education on four key messages:

- Prediabetes is a serious condition: It raises your risk of heart attack and stroke and poses a very high risk of eventually progressing to full-blown diabetes
- Prediabetes is treatable: The good news is that most patients with prediabetes can avoid or delay developing diabetes by losing weight, becoming more active and eating more healthfully

**LOSING
5-7%**



**OF YOUR BODY WEIGHT
IS THE GOAL FOR
DIABETES PREVENTION***

That is 10-14 pounds for a person who weighs 200 pounds.

Increasing physical activity, eating healthier foods and losing weight are the key steps.

- Evidence-based diabetes prevention programs are available. These programs help people with prediabetes accomplish these healthy changes, lose weight and avoid developing diabetes

Q&A

How much does it cost to participate in the diabetes prevention program?

While costs may vary, the average cost per participant is approximately \$400 to \$500 for the yearlong program. These costs can be covered in a variety of ways. Some program providers offer monthly payment plans and discounts based on ability to pay. A growing number of private health insurers also offer coverage for patient participation in diabetes prevention programs. Ask patients to contact their insurance provider to determine coverage.

How can I explain prediabetes to patients so they understand?

You might consider saying: “Your blood sugar is higher than normal, but not at a level of diabetes. We call this prediabetes. Prediabetes is serious because it increases your risk of getting type 2 diabetes. Prediabetes can also double your chances of suffering from heart disease or a stroke. The good news is that prediabetes is reversible. There are things you can do now to prevent prediabetes from progressing to diabetes. Studies show that you can cut your chance of developing diabetes in half by losing XX pounds (5-7 percent of body weight), eating healthier and exercising regularly.”

Use a patient handout, such as “So you have prediabetes...now what?” to help you reinforce these messages.

DOWNLOAD [So you have prediabetes...now what?](#)

What if my patient does not have access to a diabetes prevention program?

While few alternatives have been shown to be as effective, if a patient with prediabetes does not have access to an evidence-based diabetes prevention program, an alternative is to refer the patient for both nutrition and physical activity counseling. Both of these services will generally be covered by insurance for patients with obesity and prediabetes.

“

To have the diabetes prevention program available is something bigger that you can give them that's clinically proven, and available nationwide, that is just unbelievable.

”



Steven Reed, MD
Park Nicollet Primary Care Physician
who refers patients to the diabetes prevention program in his community

4

Refer patients to an evidence-based diabetes prevention program

If the patient is interested and ready to make healthy lifestyle changes, then refer him or her to an **in-person, virtual or online diabetes prevention program**.

Locate diabetes prevention programs in your community by:

- A** Calling 1-800-DIABETES
- B** Using the **CDC's registry** to find in-person, virtual or online diabetes prevention programs that are part of the CDC's National Diabetes Prevention Program
- C** Locating a **YMCA diabetes prevention program**

The YMCA is the largest U.S. provider of in-person diabetes prevention programs. The YMCA uses the CDC model for diabetes prevention and has been found to be as effective as the original diabetes prevention program when tested in clinical trials.

The AMA and CDC, along with physicians and care teams at multiple physician practices in communities within four states, have developed a step-by-step toolkit on how to screen, test and refer high-risk patients to diabetes prevention programs in their communities. The toolkit includes multiple resources that practices can adapt to best meet their needs. **Prevent Diabetes STAT: Screen, Test, Act - Today™**.

DOWNLOAD [Access the toolkit](#)

Q&A

How can I get a diabetes prevention program in my community?

Physicians and members of their care teams can advocate for community organizations or their own health system to offer the diabetes prevention program. You may want to speak with the director of your local YMCA, hospital, state health department or other interested community organization about the need to address prediabetes locally and encourage them to offer in-person, virtual or online diabetes prevention programs. It's important that they follow the CDC's evidence-based curriculum, and become a **CDC-recognized** provider.

“

We don't have all that time to spend with them in classes and teach them about their eating habits and counting calories and sugar, so they actually go spend time with a person in a group session and they can get all that from them.

”



Yolanda Freeman
Fana Medical Group Practice Manager

“

I believe that physicians, nurse practitioners and physician assistants really need to send their patients so that they can get the benefit of this program. This program works. We saw it in our patients.

”



Miguel Fana, MD
Fana Medical Group

5

Follow-up on weight loss progress

Plan a three- or six-month follow-up with patients to assess their progress towards their weight loss goals and to address barriers to weight loss and a healthy lifestyle.

Q&A

How can I get feedback on my patient from a diabetes prevention program?

Most programs send reports of participant progress to referring clinicians after the eighth and 16th group sessions. In addition, participants in the program complete periodic self-evaluations that referring clinicians can request directly from patients. You can also contact the diabetes prevention program in the area and request to receive information about your patients' participation.



AMA Pearls

Prevention is a team sport

Diabetes prevention is a team sport. This one-page document – [M.A.P. \(Measure, Act, Partner\)](#) – can help you and your team determine roles and responsibilities regarding diabetes prevention and your practice workflow.

Using the EHR to identify patients with prediabetes

You can use blood values you already have recorded in your EHR to identify patients with prediabetes. Use this one-page infographic—[Retrospective prediabetes identification](#)—to set up a prediabetes registry using your EHR.

Receive performance improvement (PI-CME) credits

[Click here](#) to participate in a PI-CME activity on prediabetes screening and treatment for a maximum of 20 *AMA PRA Category 1 Credits™*.

Conclusion

Integrate new diabetes prevention strategies, tools and resources into your practice workflow. Screen and test patients for prediabetes, and refer them to a diabetes prevention program that's part of the CDC's National Diabetes Prevention Program. The learnings in this module can help you create links between your clinic and evidence-based community resources to reduce chronic illness and improve outcomes for your patients.

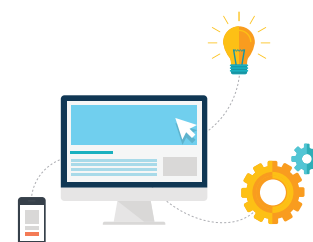




To demonstrate completion of this module and claim *AMA PRA Category 1 Credits™*, please visit:
www.stepsforward.org/PreventingDiabetes

Get implementation support

The AMA is committed to helping you implement the solutions presented in this module. If you would like to learn about available resources for implementing the strategies presented in this module, please call us at (800) 987-1106 or [click here](mailto:StepsForward@ama-assn.org) to send a message to StepsForward@ama-assn.org



References

- Centers for Disease Control and Prevention. *National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States*, 2014. Atlanta, GA; 2014. <http://www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf>
- Knowler WC, Barrett-Connor E, Fowler SE, et al; Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*. 2002;346:393-403.
- Tuomilehto J, Lindstrom J, Eriksson J, et al; Finnish Diabetes Prevention Study Group. Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *N Engl J Med*. 2001; 344:1343-50.
- Holman RR, Paul SK, Bethel MA, Matthews DR, Neil HAW. 10-year follow-up of intensive glucose control in type 2 diabetes. *N Engl J Med*. 2008;359:1577-89. doi:10.1056/NEJMoa0806470.
- Nathan DM, Cleary PA, Backlund JY, et al; Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) Study Research Group. Intensive diabetes treatment and cardiovascular disease in patients with type 1 diabetes. *N Engl J Med*. 2005;353(25):2643-53.
- The Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med*. 1993;329(14):977-86.
- UK Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). *Lancet*. 1998;352(9131):837-53.
- Herman WH, Hoerger TJ, Brandle M, et al; Diabetes Prevention Program Research Group. The cost-effectiveness of lifestyle modification or metformin in preventing type 2 diabetes in adults with impaired glucose tolerance. *Ann Intern Med*. 2005;142:323-32.
- Ratner R, Goldberg R, Haffner S, et al.; Diabetes Prevention Program Research Group. Impact of intensive lifestyle and metformin therapy on cardiovascular disease risk factors in the Diabetes Prevention Program. *Diabetes Care*. 2005;28:888-94.
- Jiang L, Manson SM, Beals J, et al; Special Diabetes Program for Indians Diabetes Prevention Demonstration Project. Translating the Diabetes Prevention Program into American Indian and Alaska Native communities: results from the Special Diabetes Program for Indians Diabetes Prevention demonstration project. *Diabetes Care*. 2013;36(7):2027-34. doi: 10.2337/dc12-1250.
- Gerstein HC, Santaguida P, Raina P, et al. Annual incidence and relative risk of diabetes in people with various categories of dysglycemia: a systematic overview and meta-analysis of prospective studies. *Diabetes Res Clin Pract*. 2007;78(3):305-12.
- Ackermann RT, Finch EA, Brizendine E, Zhou H, Marrero DG. Translating the Diabetes Prevention Program into the community. The DEPLOY Pilot Study. *Am J Prev Med*. 2008;35(4):357-63.
- Knowler WC, Fowler SE, Hamman RF, et al; Diabetes Prevention Program Research Group. 10-year follow-up of diabetes incidence and weight loss in the Diabetes Prevention Program Outcomes Study. *Lancet*. 2009;374(9702):1677-86.

14. Whittemore R. A systematic review of the translational research on the Diabetes Prevention Program. *Transl Behav Med.* 2011;1(3):480-91. doi:10.1007/s13142-011-0062-y.
15. Johnson M, Jones R, Freeman C, et al. Can diabetes prevention programmes be translated effectively into real-world settings and still deliver improved outcomes? A synthesis of evidence. *Diabet Med.* 2013;30(1):3-15.
16. Ma J, Yank V, Xiao L, et al. Translating the Diabetes Prevention Program lifestyle intervention for weight loss into primary care: a randomized trial. *JAMA Intern Med.* 2013;173(2):113-21.
17. Albright AL, Gregg EW. Preventing type 2 diabetes in communities across the U.S.: the National Diabetes Prevention Program. *Am J Prev Med.* 2013;44(4 Suppl 4):S346-51.
18. PCMH recognition via Standard 4: Self-Care Support, B. Provide Referrals to Community Resources (3 points), *NCQA Facilitating PCMH Recognition*, 2011.
19. American Medical Association. PREVENTING TYPE 2 DIABETES: *A guide to refer patients to the YMCA's Diabetes Prevention Program*. Chicago, IL: Improving Health Outcomes, American Medical Association; 2014.
20. Diabetes Prevention Program Research Group. Long-term safety, tolerability, and weight loss associated with metformin in the Diabetes Prevention Program Outcomes Study. *Diabetes Care.* 2012;35:731-7.
21. Lilly M, Godwin M. Treating prediabetes with metformin. *Can Fam Physician.* 2009;55:363-9.
22. American Diabetes Association. Prevention or delay of type 2 diabetes. In: *Standards of Medical Care in Diabetes.* *Diabetes Care.* 2015;38(Suppl. 1):S31-S32. doi: 10.2337/dc15-S008"

Are you at risk for prediabetes?



1 in 3 U.S. adults has prediabetes. Most don't know it. Are you at risk?

You may have prediabetes and be at risk for type 2 diabetes if you:

- Are 45 years of age or older
- Are overweight
- Have a family history of type 2 diabetes
- Have high blood pressure
- Are physically active fewer than three times per week
- Ever had diabetes while pregnant (gestational diabetes) or gave birth to a baby that weighed more than 9 pounds

Prediabetes can lead to serious health problems

Having prediabetes means your blood glucose (sugar) level is higher than normal, but not high enough to be diagnosed as diabetes. But, nearly 90 percent of adults who have prediabetes don't know they have it.

If you have prediabetes and don't lose weight or increase your physical activity, you could develop type 2 diabetes within five years. Type 2 diabetes is a serious condition that can lead to health issues such as heart attack, stroke, blindness, kidney failure, or loss of toes, feet or legs.

What can you do?

- Talk to your doctor about your risk of having prediabetes.

Here's the good news

If you have prediabetes, your doctor may refer you to a proven lifestyle change program that can help you prevent or delay getting type 2 diabetes.

The National Diabetes Prevention Program can help!

The National Diabetes Prevention Program (National DPP) uses a program that is proven to prevent or delay type 2 diabetes, and will help you lower your risk by improving your food choices and increasing physical activity.

How does it work? As part of a group in your community or online, you will work with a trained lifestyle coach to learn the skills you need to make lasting lifestyle changes. You will learn to eat healthy, add physical activity to your life, manage stress, stay motivated and solve problems that can get in the way of healthy changes.

Features

- Trained coach to guide and encourage you
- In-person or online
- CDC-approved program
- Support from others working on the same goals as you
- Skills to help you lose weight, be more physically active and manage stress
- Some insurance companies will cover

What participants are saying ...

"I love having a lifestyle coach. She has given us great information, helped me stay on track and stay positive!"
—Bruce

"I'm so excited because I went to the doctor last week and all of my numbers were down and I officially no longer have prediabetes."

—Vivien

Now is the time to take charge of your health and make a change! Ask your doctor or nurse.

Point-of-care prediabetes identification

MEASURE

If the patient is age 40-70 (USPSTF criteria), is obese or overweight, and does not have diabetes, proceed to the blood test.

If the patient is age >18 and does not have diabetes, nor meet the criteria above, provide self-screening test, and if self-screening test reveals high risk, proceed to next step.



Review medical record to determine if BMI $\geq 24^*$ (≥ 22 if Asian) or history of GDM**

NO



If no: Patient does not currently meet program eligibility requirements

YES



Determine if a HbA1C, FPG or OGTT was performed in the past 12 months

NO



Order one of the tests below:

- Hemoglobin A1C (HbA1C)
- Fasting plasma glucose (FPG)
- Oral glucose tolerance test (OGTT)

YES



RESULTS



Diagnostic test	Normal	Prediabetes	Diabetes
HbA1C(%)	< 5.7	5.7–6.4	≥ 6.5
Fasting plasma glucose (mg/dL)	< 100	100–125	≥ 126
Oral glucose tolerance test (mg/dL)	<140	140–199	≥ 200

ACT

Encourage patient to maintain a healthy lifestyle.

Continue with exam/consult. Retest within three years of last negative test.

Refer to diabetes prevention program, provide brochure.

Consider retesting annually to check for diabetes onset.

Confirm diagnosis; retest if necessary.

Counsel patient re: diagnosis.
Initiate therapy.

PARTNER

Communicate with your local diabetes prevention program.

Contact patient and troubleshoot issues with enrollment or participation. At the next visit, ask patient about progress and encourage continued participation in the program.

Adapted from: New York State Department of Health. New York State Diabetes Prevention Program (NYS DDP) prediabetes identification and intervention algorithm. New York: NY Department of Health; 2012.

* These BMI levels reflect eligibility for the National DPP as noted in the CDC Diabetes Prevention Recognition Program Standards and Operating Procedures. The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

** History of GDM = eligibility for diabetes prevention program.



Letter template

Use/adapt these templates to conduct efficient follow-up and referral with patients who have been identified as having prediabetes

<<YOUR LETTERHEAD>>

<<ADDRESS>>

<<PHONE NUMBER>>

<<DATE>>

<<PATIENT NAME>>

<<PATIENT ADDRESS>>

Dr. Mr./Mrs. <<PATIENT LAST NAME>>,

Thank you for being a patient of the <<PRACTICE NAME HERE>>. We are writing to tell you about a service to help make your health better.

Based on our review of your medical chart, you have a condition known as prediabetes. This means your blood sugar is higher than normal, which increases your risk of developing serious health problems including type 2 diabetes, as well as heart disease and stroke.

We have some good news. Our office wants you to know that you may be eligible for a diabetes prevention program run by our partners, <<NAME OF PROGRAM PROVIDER>>. This program is proven to reduce your risk of developing diabetes and other health problems.

We have sent a referral to <<NAME OF PROGRAM PROVIDER>> and someone will call you to discuss the program, answer any questions you may have and, if you are interested, enroll you in the program.

Please feel free to give <<NAME OF PROGRAM PROVIDER>> a call at <<PHONE NUMBER>>.

–OR–

We have sent a referral to <<NAME OF PROGRAM PROVIDER>> and we urge you to call <<PHONE NUMBER>> to learn more about the program and enroll.

We hope you will take advantage of this program, which can help prevent you from developing serious health problems.

Sincerely,

Dr. <<PHYSICIAN LAST NAME>>



Sample “Talking points” for phone outreach

- Hello <<PATIENT NAME>>.
- I am calling from <<PRACTICE NAME HERE>>.
- I’m calling to tell you about a program we’d like you to consider, to help you prevent some serious health problems.
- Based on our review of your medical chart, you have a condition known as prediabetes. This means your blood sugar is higher than normal, which makes you more likely to develop serious health problems including type 2 diabetes, stroke and heart disease.
- We have some good news, too.
- You may be eligible for a diabetes prevention program run by our partners, <<NAME OF PROGRAM PROVIDER>>.
 - Their program is based on research proven to reduce your risk of developing diabetes and other health problems.

Option A

- We have sent a referral to <<NAME OF PROGRAM PROVIDER >> and someone will call you to discuss the program, answer any questions you may have and, if you are interested, enroll you in the program.
- Please feel free to give <<NAME OF PROGRAM PROVIDER>> a call at <<PHONE NUMBER>>.
- Do you have any questions for me?
- Thank you for your time and be well.

Option B

- We have sent a referral to <<NAME OF PROGRAM PROVIDER>> and we urge you to call <<PHONE NUMBER>> to learn more about the program and enroll.
- We hope you will take advantage of this program, which can help prevent you from developing serious health problems.
- Do you have any questions for me?
- Thank you for your time and be well.

M.A.P. (Measure, Act, Partner)

THE M.A.P. (Measure, Act, Partner) to prevent type 2 diabetes—physicians and care teams can use this document to determine roles and responsibilities for identifying adult patients with prediabetes and referring to community-based diabetes prevention programs. “Point-of-Care” and “Retrospective” methods may be used together or alone.

Choose and check what works best for your practice

Step 1: Measure	When	Who	How (draw from AMA-CDC tools)
Point-of-care method <ul style="list-style-type: none"> Assess risk for prediabetes during routine office visit Test and evaluate blood glucose level based on risk status 	<ul style="list-style-type: none"> During vital signs 	<ul style="list-style-type: none"> Medical assistant Nurse Physician Other _____ 	<ul style="list-style-type: none"> Provide “Are you at risk for prediabetes?” patient education handout in waiting area Use/adapt “Patient flow process” tool Use CDC or ADA risk assessment questionnaire at check-in Display 8 x 11” patient-facing poster promoting prediabetes awareness to your patients Use/adapt “Point-of-care algorithm”
Retrospective method <ul style="list-style-type: none"> Query EHR to identify patients with BMI ≥ 24; ≥ 22 if Asian* and blood glucose level in the prediabetes range 	<ul style="list-style-type: none"> Every 6–12 months 	<ul style="list-style-type: none"> Health IT staff Other _____ 	<ul style="list-style-type: none"> Use/adapt “Retrospective algorithm”
Step 2: Act			
Point-of-care method <ul style="list-style-type: none"> Counsel patient re: prediabetes and treatment options during office visit Refer patient to diabetes prevention program Share patient contact info with program provider** 	<ul style="list-style-type: none"> During the visit 	<ul style="list-style-type: none"> Medical assistant Nurse Physician Other _____ 	<ul style="list-style-type: none"> Advise patient using “So you have prediabetes ... now what?” handout Use/adapt “Health care practitioner referral form” Refer to “Commonly used CPT and ICD codes”
Retrospective method <ul style="list-style-type: none"> Inform patient of prediabetes status via mail, email or phone call Make patient aware of referral and info sharing with program provider Refer patient to diabetes prevention program Share patient contact info with program provider** 	<ul style="list-style-type: none"> Contact patient soon after EHR query 	<ul style="list-style-type: none"> Health IT staff Medical assistant (for phone calls) Other _____ 	<ul style="list-style-type: none"> Use/adapt “Patient letter/phone call” template Use/adapt “Health care practitioner referral form” for making individual referrals Use/adapt “Business Associate Agreement” template on AMA’s website if needed
Step 3: Partner			
With diabetes prevention programs <ul style="list-style-type: none"> Engage and communicate with your local diabetes prevention program Establish process to receive feedback from program about your patients’ participation 	<ul style="list-style-type: none"> Establish contact before making 1st referral 	<ul style="list-style-type: none"> Office manager Other _____ 	Use/adapt “Business Associate Agreement” template on AMA’s website if needed Refer to “Commonly used CPT and ICD codes”
With patients <ul style="list-style-type: none"> Explore motivating factors important to the patient At follow-up visit, order/review blood tests to determine impact of program and reinforce continued program participation Discuss program feedback with patient and integrate into care plan 	<ul style="list-style-type: none"> During office visit Other _____ 	<ul style="list-style-type: none"> Medical assistant Nurse Physician Other _____ 	<ul style="list-style-type: none"> Advise patient using “So you have prediabetes ... now what?” handout and provide CDC physical activity fact sheet www.cdc.gov/physicalactivity

*These BMI levels reflect eligibility for the National DPP as noted in the CDC Diabetes Prevention Recognition Program Standards and Operating Procedures.

The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

**To share patient contact information with a diabetes prevention program, you may need a Business Associate Agreement (BAA).

Patient risk assessment

DO YOU HAVE PREDIABETES?

Prediabetes Risk Test

1 How old are you?

Less than 40 years (0 points)
40—49 years (1 point)
50—59 years (2 points)
60 years or older (3 points)

Write your score
in the box.



2 Are you a man or a woman?

Man (1 point) Woman (0 points)

3 If you are a woman, have you ever been diagnosed with gestational diabetes?

Yes (1 point) No (0 points)

4 Do you have a mother, father, sister, or brother with diabetes?

Yes (1 point) No (0 points)

5 Have you ever been diagnosed with high blood pressure?

Yes (1 point) No (0 points)

6 Are you physically active?

Yes (0 points) No (1 point)

7 What is your weight status?
(see chart at right)

Height	Weight (lbs.)		
4' 10"	119-142	143-190	191+
4' 11"	124-147	148-197	198+
5' 0"	128-152	153-203	204+
5' 1"	132-157	158-210	211+
5' 2"	136-163	164-217	218+
5' 3"	141-168	169-224	225+
5' 4"	145-173	174-231	232+
5' 5"	150-179	180-239	240+
5' 6"	155-185	186-246	247+
5' 7"	159-190	191-254	255+
5' 8"	164-196	197-261	262+
5' 9"	169-202	203-269	270+
5' 10"	174-208	209-277	278+
5' 11"	179-214	215-285	286+
6' 0"	184-220	221-293	294+
6' 1"	189-226	227-301	302+
6' 2"	194-232	233-310	311+
6' 3"	200-239	240-318	319+
6' 4"	205-245	246-327	328+
	(1 Point)	(2 Points)	(3 Points)
	You weigh less than the amount in the left column (0 points)		

Adapted from Bang et al., Ann Intern Med
151:775-783, 2009.
Original algorithm was validated without
gestational diabetes as part of the model.

If you scored 5 or higher:

You're likely to have prediabetes and are at high risk for type 2 diabetes. However, only your doctor can tell for sure if you do have type 2 diabetes or prediabetes (a condition that precedes type 2 diabetes in which blood glucose levels are higher than normal). Talk to your doctor to see if additional testing is needed.

Type 2 diabetes is more common in African Americans, Hispanic/Latinos, American Indians, Asian Americans and Pacific Islanders.

Higher body weights increase diabetes risk for everyone. Asian Americans are at increased diabetes risk at lower body weights than the rest of the general public (about 15 pounds lower).

Add up
your score.



LOWER YOUR RISK

Here's the good news: it is possible with small steps to reverse prediabetes - and these measures can help you live a longer and healthier life.

If you are at high risk, the best thing to do is contact your doctor to see if additional testing is needed.

Visit DoIHavePrediabetes.org for more information on how to make small lifestyle changes to help lower your risk.

For more information, visit us at

DoIHavePrediabetes.org



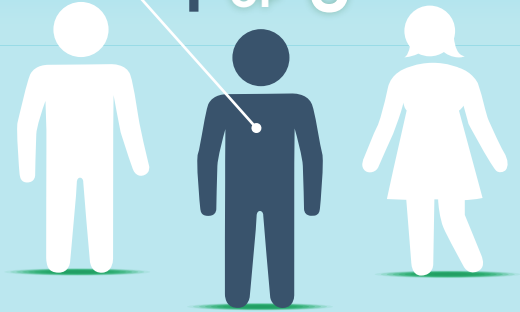
PREDIABETES

COULD IT
BE YOU?

84.1
MILLION

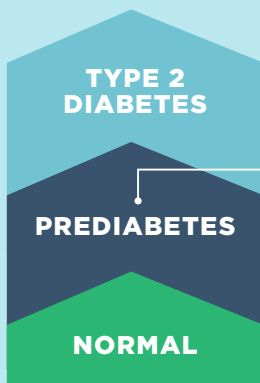
84.1 million
American adults —
more than
1 out of 3 — have
prediabetes

1 OUT OF 3



9 OUT OF 10

people with prediabetes
don't know they have it



Prediabetes is
when your blood
sugar level is higher
than normal but not
high enough yet to
be diagnosed as
type 2 diabetes

Prediabetes increases your risk of:



TYPE 2
DIABETES



HEART
DISEASE



STROKE



If you have
prediabetes,
losing weight by:



EATING
HEALTHY



BEING
MORE
ACTIVE

can cut your risk of
getting type 2 diabetes in

HALF



Ignore prediabetes and type 2 diabetes risk goes up — and so does risk for serious health complications:



BLINDNESS



**KIDNEY
FAILURE**



**HEART
DISEASE**



STROKE



**LOSS OF TOES,
FEET, OR LEGS**

YOU CAN PREVENT TYPE 2 DIABETES

FIND OUT IF YOU HAVE PREDIABETES —

See your doctor to get your blood sugar tested



- ✓ eat healthy
- ✓ be more active
- ✓ lose weight

JOIN A CDC- RECOGNIZED

diabetes
prevention
program



LEARN MORE FROM CDC AND TAKE THE **PREDIABETES RISK QUIZ** AT
www.cdc.gov/diabetes/basics/prediabetes.html

REFERENCES

Centers for Disease Control and Prevention. National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States, 2017. Atlanta, GA: U.S. Department of Health and Human Services; 2017.

Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2015 on CDC WONDER Online Database, released December, 2016. Data are from the Multiple Cause of Death Files, 1999-2015, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/ucd-icd10.html> on April 4, 2017.

CDC's Division of Diabetes Translation works toward a world free of the devastation of diabetes.



Why participate in a diabetes prevention program?

What is prediabetes?

A condition in which blood glucose or hemoglobin A1C (HbA1C) levels are higher than normal but not high enough yet to be diagnosed as type 2 diabetes.

1 of 3 ADULTS IN THE U.S. HAS PREDIABETES



The good news is that there's a program that can help you.

The National Diabetes Prevention Program, led by the Centers for Disease Control and Prevention (CDC), uses a method proven to prevent or delay type 2 diabetes.

Why act now?

You are at higher risk of developing type 2 diabetes in the future.

Compared to people without diabetes, those with diabetes are:

100%
more likely to develop
hypertension

80%
more likely to be
hospitalized for
heart attack

50%
more likely to be
hospitalized for
a stroke

70%
more likely to die from
heart disease or stroke

What is a lifestyle change program?



Increased physical activity
150 minutes/week



Healthy eating



**Stress management
& behavior modifications**

**First
6 months**
weekly curriculum

**Next
6 months**
meet once/twice
a month for
maintenance

**Achieve
minimum
5% of body
weight loss**

**Reduce
chance
of getting
diabetes
by 58%**

Referral Rx – Lifestyle change program

Name _____

Date (DD/MM/YYYY) _____

Date of birth (DD/MM/YYYY) _____

I recommend that you participate in the Diabetes Prevention Program based on the following criteria:

☐ BMI= _____ (≥ 24, if Asian ≥ 22*)

and

☐ A1c: 5.7–6.4%

☐ Fasting plasma glucose: 100-125mg/dL

☐ Oral tolerance levels: 140-199mg/dL

or

☐ History of gestational diabetes

Print name of medical professional _____

Signature _____

Care team contact info _____

I recommend that you enroll in the Diabetes Prevention Program offered by: _____



*These BMI levels reflect eligibility for the National DPP as noted in the CDC Diabetes Prevention Recognition Program Standards and Operating Procedures. The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥23 for Asian Americans and ≥25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

Prevent Diabetes **STAT** | Screen / Test / Act Today™

Retrospective prediabetes identification

MEASURE

Query EMR or patient database every 6–12 months using the following criteria:

A. Inclusion criteria:

- Age ≥ 18 years **and**
- Most recent BMI ≥ 24 (≥ 22 if Asian)* **and**
- A positive lab test result within previous 12 months:
 - HbA1C 5.7–6.4% (LOINC code 4548-4) **or**
 - FPG 100–125 mg/dL (LOINC code 1558-6) **or**
 - OGTT 140–199 mg/dL (LOINC code 62856-0) **or**
- History of gestational diabetes (ICD-9: V12.21; ICD-10: Z86.32)

B. Exclusion criteria:

- Current diagnosis of diabetes (ICD-9: 250.xx; ICD-10: E10.x, E11.x, E13.x and O24.x) **or**
- Current Insulin use

Generate a list of patient names with relevant information

ACT

Use the patient list to:

- A. Contact patients to inform of risk status, explain prediabetes, and share info on diabetes prevention programs, **and/or**
- B. Send patient info to diabetes prevention program provider
- Program coordinator will contact patient directly, **and**
- C. Flag medical record for patient's next office visit

PARTNER

Discuss program participation at next visit

* These BMI levels reflect eligibility for the National DPP as noted in the CDC Diabetes Prevention Recognition Program Standards and Operating Procedures. The American Diabetes Association (ADA) encourages screening for diabetes at a BMI of ≥ 23 for Asian Americans and ≥ 25 for non-Asian Americans, and some programs may use the ADA screening criteria for program eligibility. Please check with your diabetes prevention program provider for their specific BMI eligibility requirements.

Codes: When screening for prediabetes and diabetes

International Classification of Diseases (ICD)-9 and ICD-10 for prediabetes and diabetes screening			
ICD-10 code (effective 10-01-2015)	ICD-10 code description	ICD-9 code (effective through 9-30-2015)	ICD-9 code description
Z13.1	Encounter for screening for diabetes mellitus	V77.1	Diabetes screening
R73.09	Other abnormal glucose	790.29	Abnormal glucose
R73.01	Impaired fasting glucose	790.21	Impaired fasting glucose
R73.02	Impaired glucose tolerance (oral)	790.22	Impaired glucose tolerance (oral)
R73.9	Hyperglycemia, unspecified	790.29	Other abnormal glucose NOS
E66.01	Morbid obesity due to excess calories	278.01	Morbid Obesity
E66.09	Other obesity due to excess calories	278.00	Obesity (NOS)
E66.8	Other obesity	278.00	Obesity (NOS)
E66.9	Obesity, unspecified	278.00	Obesity (NOS)
E66.3	Overweight	278.02	Overweight
Z68.3x	Body mass indexes 30.0-39.9 (adult)	V85.30-V85.39	Body mass indexes 30.0-39.9 (adult)
Z68.4x	Body mass indexes ≥40.0 (adult)	V85.41-V85.45	Body mass indexes 30.0-39.9 (adult)

Current Procedural Terminology (CPT®) for diabetes screening tests			
CPT E/M codes for prevention-related office visits		CPT codes for office-based laboratory testing	
Preventive Visit New Patient Commercial/Medicaid	99381-99387	83036QW	Office-based Hemoglobin A1C testing
Preventive Visit Established Patient Commercial/Medicaid	99391-99397	82962	Office-based finger stick glucose testing
Annual Wellness Visit Initial Medicare	G0438		
Annual Wellness Visit Subsequent Medicare	G0439		

(Continued on next page)



Current Procedural Terminology (CPT®) for diabetes screening tests

CPT E/M codes for prevention-related office visits		CPT codes for office-based laboratory testing	
Individual Preventive Counseling* Commercial/Medicaid	99401 – Approx 15min 99402 – Approx 30min 99403 – Approx 45min 99404 – Approx 60min		
Face-to-Face Obesity	G0447 – 15 minutes		
Counseling for Obesity† Medicare			

These codes may be useful to report services/tests performed to screen for prediabetes and diabetes.

* Preventive codes 99381-99397 include counseling and cannot be combined with additional counseling codes. If significant risk factor reduction and/or behavior change counseling is provided during a problem-oriented encounter, additional preventive counseling may be billed. In this case, modifier 25 code may allow for payment for both services, although this may vary by payer. Reimbursement for this code is not guaranteed.

† Must be billed with an ICD code indicating a BMI of 30 or greater. Medicare does not allow billing for another service provided on the same day.





What is the evidence base for the prevention of diabetes through lifestyle change interventions?

Over the last 15 years, a number of scientific studies have evaluated the design and effectiveness of lifestyle change interventions for delaying or preventing the onset of type 2 diabetes among overweight or obese adults who have blood glucose levels in the prediabetes range. A few representative studies are summarized below.

The original NIH-funded Diabetes Prevention Program study

Funded by the National Institutes of Health (NIH), a multi-center randomized controlled clinical trial of 3,234 overweight adults with prediabetes proved that a structured intensive behavioral counseling intervention that lowered body weight by 7 percent through a low-fat diet and increased physical activity reduced the risk of progression to diabetes by 58 percent over three years compared with placebo. Among adults 60 years and older, the risk reduction was even greater at 71 percent. This translates to one case of diabetes prevented for every seven adults receiving the lifestyle change intervention.

Knowler WC, Barrett-Connor E, Fowler SE, et al. Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*. 2002;346(6):393-403.

The intervention delivered in a real-world primary care setting

In a randomized controlled trial conducted in a primary care clinic, two adapted diabetes prevention program lifestyle interventions—a coach-led group intervention and self-directed DVD intervention—were compared with usual care and found that both interventions achieved weight loss similar to the original NIH-funded study. The adapted curriculum was delivered jointly by certified dietitians and fitness instructors to the coach-led group at clinic sites, whereas both groups received secure email reminders about self-monitoring via the clinic's electronic health record.

Ma J, Yank V, Xiao L, et al. Translating the Diabetes Prevention Program lifestyle intervention for weight loss into primary care: a randomized trial. *JAMA Intern Med*. 2013;173(2):113-121.

The intervention delivered in the community

The Diabetes Education and Prevention with a Lifestyle Intervention Offered at the YMCA (DEPLOY) study—a matched-pair, group-randomized pilot intervention—compared group-based diabetes prevention program behavioral counseling delivered by trained YMCA staff to brief counseling alone and found that a scaled-down, low-cost version of the program delivered in a community setting could achieve weight loss comparable to the original NIH-funded study.

Ackermann RT, Finch EA, Brizendine E, Zhou H, Marrero DG. Translating the Diabetes Prevention Program into the community. The DEPLOY Pilot Study. *Am J Prev Med*. 2008;35(4):357-363.

The intervention delivered via an online social network

In a before-after comparison of subjects recruited online to participate in a diabetes prevention program-based group lifestyle intervention that integrated online social networking, online health coaching and a wireless scale and pedometer, participants achieved outcomes that met the Centers for Disease Control and Prevention (CDC) Diabetes Prevention Recognition Program standards and compared favorably to other program translations.

Sepah SC, Jiang L, Peters AL. Translating the Diabetes Prevention Program into an online social network: validation against CDC standards. *Diabetes Educ*. 2014;40(4):435-443.

Fifteen-year outcomes of the original NIH-funded Diabetes Prevention Program study

A 15-year follow-up of 2,776 participants from the original NIH-funded research study revealed that diabetes incidence in the 15 years since study randomization was reduced by 27 percent in the lifestyle group compared with placebo. Among women, those participating in the intensive lifestyle intervention had a 21 percent lower prevalence of microvascular complications compared with placebo. Participants who did not develop diabetes had a 28 percent lower prevalence of microvascular complications compared to those who did develop diabetes.

Diabetes Prevention Program Research Group. Long-term effects of lifestyle intervention or metformin on diabetes development and microvascular complications over 15-year follow-up: the Diabetes Prevention Program Outcomes Study. *Lancet Diabetes Endocrinol.* 2015;3:866-875.

Systematic review of translational studies based on the original NIH-funded study

A systematic review of 17 translational studies based on the original NIH-funded research study found that group-based interventions yielded significant weight loss—with the expectation of concomitant reductions in the risk of type 2 diabetes—with the resulting benefits increasing proportionately with sustained weight loss over time. A review of behavioral strategies used in these studies revealed that interventions comprising modified versions of most of the core modules of the original NIH-funded research study were most effective in producing the desired behavioral changes.

Johnson M, Jones R, Freeman C, et al. Can diabetes prevention programmes be translated effectively into real-world settings and still deliver improved outcomes? A synthesis of evidence. *Diabet Med.* 2013;30(1):3-15.

Primary predictor of reduced diabetes incidence

An investigation into the relative contributions of changes in weight, diet and physical activity on the risk of developing type 2 diabetes among participants in the lifestyle intervention group from the original NIH-funded Diabetes Prevention Program study found that weight loss was the primary predictor of reduced diabetes incidence.

Hamman RF, Wing RR, Edelstein SL, et al. Effect of weight loss with lifestyle intervention on risk of diabetes. *Diabetes Care.* 2006;29(9):2102–2107.

Impact of the diabetes prevention program lifestyle intervention on hypertension and hyperlipidemia

An assessment of the impact of the lifestyle intervention on hypertension and hyperlipidemia revealed that hypertension control improved significantly, triglycerides decreased significantly and HDL cholesterol increased significantly in the lifestyle intervention group compared with placebo, resulting in a greater than 25 percent reduction in medication use for hypertension and hyperlipidemia.

Ratner R, Goldberg R, Haffner S, et al. Impact of intensive lifestyle and metformin therapy on cardiovascular disease risk factors in the diabetes prevention program. *Diabetes Care.* 2005;28(4):888- 894.

Cost-effectiveness of the diabetes prevention program intervention

A systematic review of studies examining the cost-effectiveness of diet and physical activity promotion programs concluded that these programs are cost-effective when delivered to persons at increased risk for type 2 diabetes. Three studies reported cost savings and group-based programs (modeled after the original Diabetes Prevention Program Research Study) were found to be highly cost-effective at a median cost of \$1,819 per quality-adjusted life year gained, when examined from a health system perspective. (Cost-effectiveness analyses in the United States commonly use a figure of \$50,000 per quality-adjusted life year gained as a threshold for assessing the cost-effectiveness of an intervention, meaning anything below \$50,000 is cost-effective.)

Li R, Zhang P, Chattopadhyay S, et al. Economic evaluation of combined diet and physical activity promotion programs to prevent type 2 diabetes among persons at increased risk: a systematic review for the community preventive services task force. *Ann Intern Med.* 2015;163:452-460.

So you have prediabetes ... now what?



Prediabetes means your blood glucose (sugar) level is higher than normal, but not high enough to be diagnosed as diabetes. This condition raises your risk of type 2 diabetes, stroke and heart disease.

What can you do about it?

The good news is that there's a program that can help you.

The National Diabetes Prevention Program, led by the Centers for Disease Control and Prevention (CDC), uses a method proven to prevent or delay type 2 diabetes.

By improving food choices and increasing physical activity, your goal will be to lose a minimum 5 percent weight loss—that is 10 pounds for a person weighing 200 pounds.

These lifestyle changes can cut your risk of developing type 2 diabetes by more than half.

How does the program work?

As part of a group, you will work with a trained diabetes prevention coach and other participants to learn the skills you need to make lasting lifestyle changes. You will learn to eat healthy, add physical activity to your life, manage stress, stay motivated and solve problems that can get in the way of healthy changes.

The program lasts one year, with 16 sessions taking place about once a week and six to eight more sessions meeting once a month. By going through the program with others who have prediabetes you can celebrate each other's successes and work together to overcome challenges.

Some insurance plans will cover the cost of the program. Check with your insurance provider to see if it is covered. Also, some places that provide the program will adjust the fee you pay based on your income.

Why should you act now?

Without weight loss and moderate physical activity, many people with prediabetes will develop type 2 diabetes within five years. Type 2 diabetes is a serious condition that can lead to health issues such as heart attack, stroke, blindness, kidney failure, or loss of toes, feet or legs. **NOW is the time to take charge of your health and make a change.**

Features of the program:

- A trained coach to guide and encourage you
- A CDC-approved program
- Group support
- Skills to help you lose weight, be more physically active and manage stress

What participants are saying ...

"I love having a lifestyle coach. She has given us great information, helped me stay on track and stay positive!"

—Bruce

"I'm so excited because I went to the doctor last week and all of my numbers were down and I officially no longer have prediabetes."

—Vivien

Sign up today for a program near you!

To find a program in our area that is part of the National Diabetes Prevention Program, visit cdc.gov/diabetes/prevention.

A SNAPSHOT

DIABETES IN THE UNITED STATES

DIABETES

30.3
MILLION

30.3 million
people have
diabetes



That's about 1 out of every 10 people



1 OUT
OF **4**

don't know
they have
diabetes

PREDIABETES

84.1
MILLION



84.1 million people —
more than 1 out of 3 adults —
have prediabetes



9 OUT
OF **10** don't know they
have prediabetes



If you have
prediabetes,
losing weight by:



**EATING
HEALTHY**



**& BEING
MORE
ACTIVE**

can cut your risk of
getting type 2 diabetes in
HALF



COST



\$245
BILLION

Total medical costs and lost
work and wages for people
with diagnosed diabetes

Risk of death
for adults with
diabetes is



50%
HIGHER



than for
adults without
diabetes

Medical costs
for people with
diabetes are
**more than
twice as high**

\$



\$

as for people
without diabetes

2X

People who have diabetes are at higher risk
of serious health complications:



BLINDNESS



**KIDNEY
FAILURE**



**HEART
DISEASE**



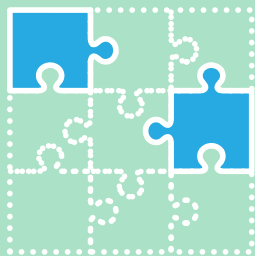
STROKE



**LOSS OF
TOES, FEET,
OR LEGS**

TYPES OF DIABETES

TYPE 1



BODY DOESN'T MAKE ENOUGH INSULIN

- Can develop at any age
- No known way to prevent it

Nearly **18,000 youth** diagnosed each year in 2011 and 2012

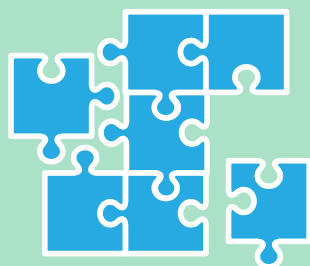


In adults, type 1 diabetes accounts for approximately

5%

of all diagnosed cases of diabetes

TYPE 2



BODY CAN'T USE INSULIN PROPERLY

- Can develop at any age
- Most cases can be prevented

In adults, type 2 diabetes accounts for approximately

95%

of all diagnosed cases of diabetes



More than **5,000 youth** diagnosed each year in 2011 and 2012

RISK FACTORS FOR TYPE 2 DIABETES:

1.5
MILLION

People
18 years
and older
diagnosed
in 2015



BEING
OVERWEIGHT



HAVING
A FAMILY
HISTORY



BEING
PHYSICALLY
INACTIVE



BEING
45 AND
OLDER

WHAT CAN YOU DO?

You can **prevent** or **delay** type 2 diabetes



LOSE
WEIGHT
IF NEEDED



EAT
HEALTHY



BE MORE
ACTIVE

LEARN MORE AT www.cdc.gov/diabetes/prevention
OR SPEAK TO YOUR DOCTOR

You can **manage** diabetes



WORK WITH A
HEALTH
PROFESSIONAL



EAT
HEALTHY



STAY
ACTIVE

LEARN MORE AT www.cdc.gov/diabetes/ndep
OR SPEAK TO YOUR DOCTOR

REFERENCES

Centers for Disease Control and Prevention. National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States, 2017. Atlanta, GA: U.S. Department of Health and Human Services; 2017.

American Diabetes Association. Economic Costs of Diabetes in the U.S. in 2012. Diabetes Care. 2013;36(4):1033-1046.

Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2015 on CDC WONDER Online Database, released December, 2016. Data are from the Multiple Cause of Death Files, 1999-2015, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/ucd-icd10.html> on April 4, 2017.

Mayer-Davis EJ, Lawrence JM, Dabelea D, Divers J, Isom S, Dolan L, et al. Incidence Trends of Type 1 and Type 2 Diabetes among Youths, 2002-2012. N Engl J Med. 2017;376:1419-29.

CDC's Division of Diabetes Translation works toward a world free of the devastation of diabetes.





Diabetes 2017 Report Card



**Centers for Disease
Control and Prevention**
National Center for Chronic
Disease Prevention and
Health Promotion

For More Information

Division of Diabetes Translation
National Center for Chronic Disease Prevention and Health Promotion
Centers for Disease Control and Prevention
4770 Buford Hwy, Mailstop F-75
Atlanta, GA 30341-3717

1-800-CDC-INFO (232-4636); TTY: 1-888-232-6348

[Contact CDC-INFO](#)

This publication is available at
www.cdc.gov/diabetes/library/reports/congress.html

Suggested Citation

Centers for Disease Control and Prevention. *Diabetes Report Card 2017*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2018.

Website addresses of nonfederal organizations are provided solely as a service to readers. Provision of an address does not constitute an endorsement of this organization by CDC or the federal government, and none should be inferred. CDC is not responsible for the content of other organizations' Web pages.



Background

The *Diabetes Report Card* has been published by the Centers for Disease Control and Prevention (CDC) every 2 years since 2012 to provide current information on the status of diabetes and its complications in the United States. It includes information and data on diabetes, preventive care practices, health outcomes, and risk factors such as race, ethnicity, socioeconomic position, and prediabetes.

The *Diabetes Report Card* also includes trend analysis for the nation and, to the extent possible, state progress in meeting established national goals and objectives for improving diabetes care and reducing health care costs and the rate of new cases. Public health professionals, state health departments, and communities can use these data to focus their diabetes prevention and control efforts on areas of greatest need.^{1,2}

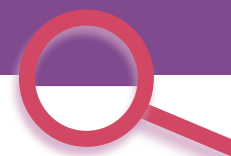
Diabetes Overview

Diabetes is a group of diseases characterized by high blood sugar. When a person has diabetes, the body either does not make enough insulin (type 1) or is unable to properly use insulin (type 2). When the body does not have enough insulin or cannot use it properly, blood sugar builds up in the blood.

People with diabetes can develop high blood pressure and high cholesterol and triglycerides (lipids). High blood sugar, particularly when combined with high blood pressure and lipids, can lead to heart disease, stroke, blindness, kidney failure, amputations of the legs and feet, and even early death. Diabetes is the seventh leading cause of death in the United States.

What's New?

- The rate of new cases of diabetes among US adults has gone down.
- The rate of new cases of diabetes among children and adolescents has gone up.
- The first national prediabetes awareness campaign was launched.
- New diabetes resources have been developed to help employers, health insurers, and states.



Diabetes Incidence and Prevalence

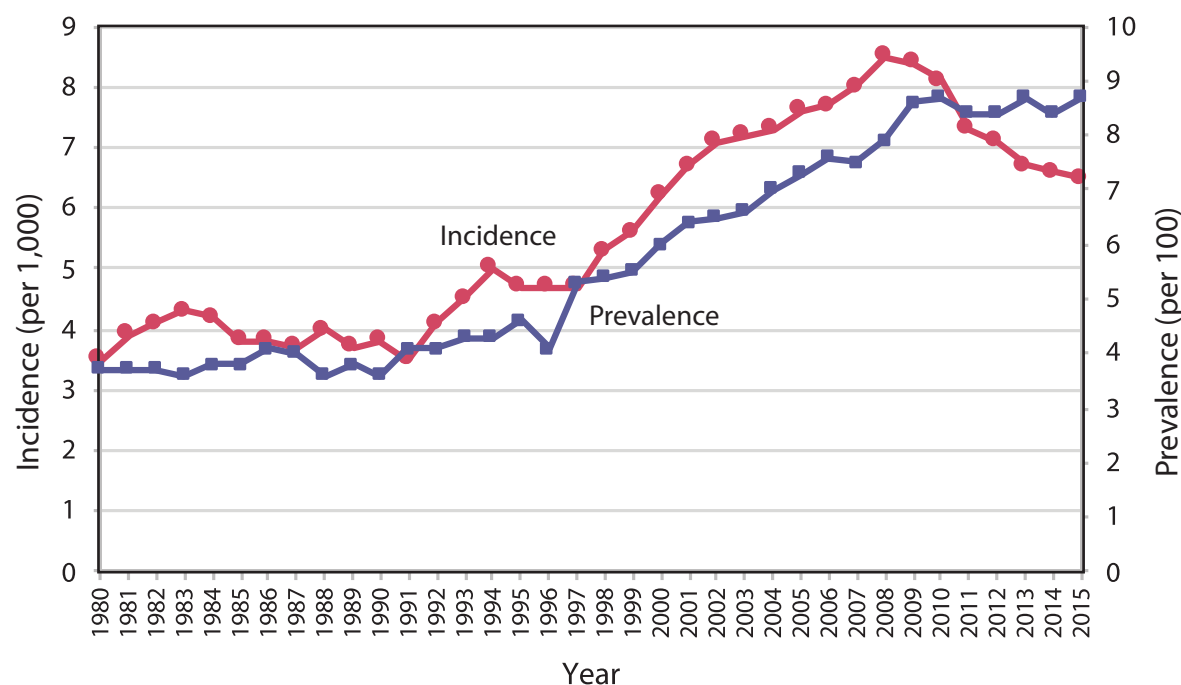
Diabetes incidence—which is the rate of new cases of diagnosed diabetes—among adults in the United States went down in 2015 and has gone down each year since 2008 (Figure 1). About 1.4 million new cases of diabetes were diagnosed among adults aged 18 to 79 in 2015.

Diabetes prevalence—which is the total number of existing cases, including new cases—among adults continues to go up (Figure 1). About 30.3 million people, or 9.4% of the US population, had diabetes in 2015. This total included 30.2 million adults aged 18 or older, or 12.2% of all US adults. About 7.2 million of these adults had diabetes but were not aware that they had the disease or did not report that they had it.³ Although the prevalence of adults with diagnosed diabetes went up sharply during the 1990s, it appears to have been stabilizing since 2009 (Figure 1).

The increase in the number of adults with diabetes in the United States may be due in part to people with the disease living longer because of improvements in self-management practices and health care services. As of 2016, more than 4,100 diabetes self-management education and support (DSMES) programs were offered across the United States.

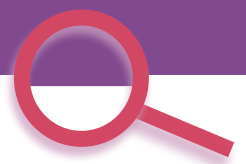
DSMES programs are intended to improve preventive practices among people with diabetes.⁴ About 1.1 million people with diabetes participated in DSMES programs recognized by the American Diabetes Association (ADA) or accredited by the American Association of Diabetes Educators (AADE) in 2016.

Figure 1. Trends in Incidence and Prevalence of Diagnosed Diabetes Among Adults Aged 18 or Older, United States, 1980–2015



Note: Rates are age-adjusted to the 2000 US standard population.

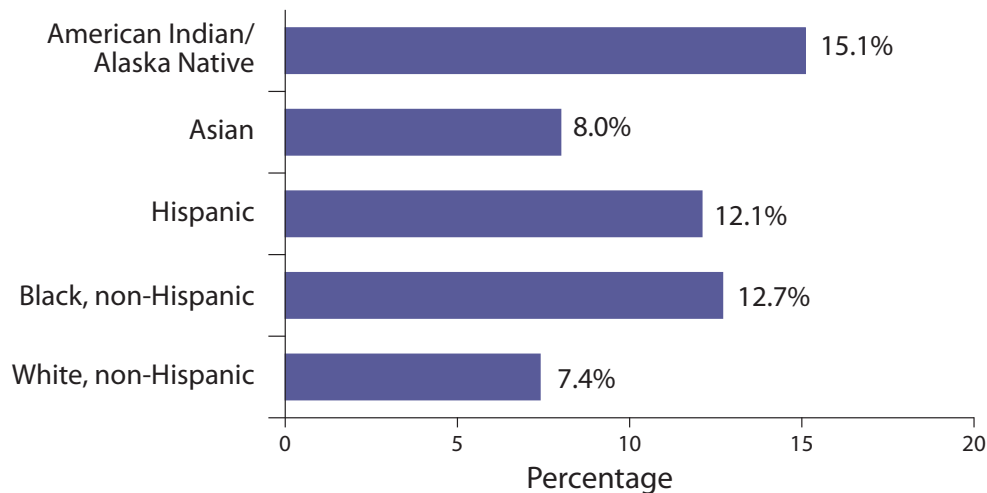
Data sources: Centers for Disease Control and Prevention, United States Diabetes Surveillance System and National Health Interview Survey.



Race, Ethnicity, and Education

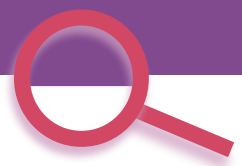
Members of some racial and ethnic minority groups are more likely to have diagnosed diabetes than non-Hispanic whites. Among adults, American Indians/Alaska Natives had the highest age-adjusted rates of diagnosed diabetes among all racial and ethnic groups examined (Figure 2).³

Figure 2. Percentage of US Adults Aged 18 or Older With Diagnosed Diabetes, by Racial and Ethnic Group, 2013–2015



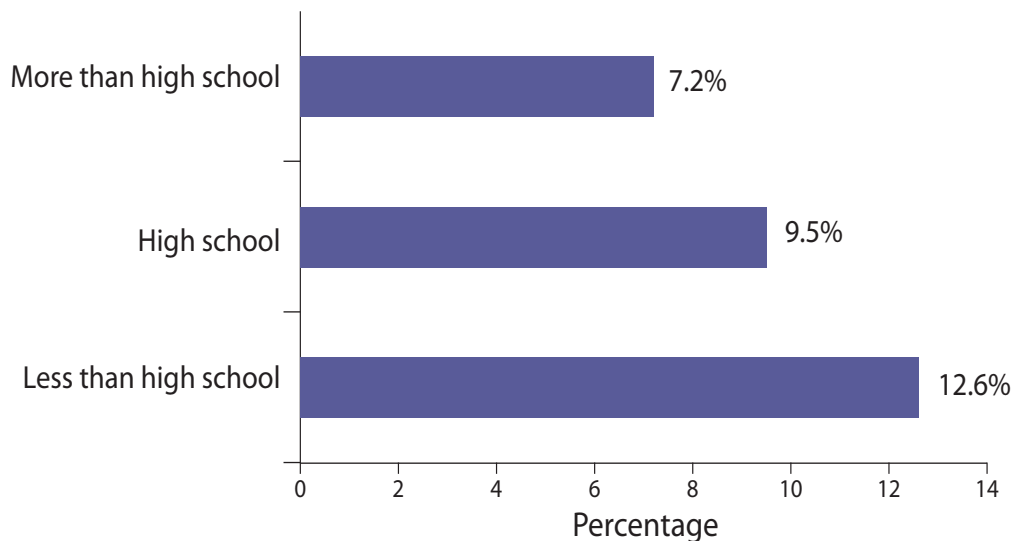
Notes: Percentages are age-adjusted to the 2000 US standard population. Figure adapted from the *National Diabetes Statistics Report, 2017*. Data sources: 2013–2015 National Health Interview Survey and 2015 Indian Health Service National Data Warehouse (American Indian/Alaska Native data).





A higher percentage of adults with less than a high school education had diagnosed diabetes compared to adults with a high school education or more than a high school education (Figure 3).³

Figure 3. Percentage of US Adults Aged 18 or Older With Diagnosed Diabetes, by Education Level, 2013–2015



Notes: Percentages are age-adjusted to the 2000 US standard population. Figure adapted from the *National Diabetes Statistics Report, 2017*. Data source: 2013–2015 National Health Interview Survey.

A person's socioeconomic position is defined by his or her education and income level. Differences in diabetes prevalence were seen in the overall US population and within racial and ethnic groups according to socioeconomic position. For example, the prevalence of diabetes increased among non-Hispanic whites with less education and lower incomes and among Hispanics with less education.⁵ In addition, an association was found between lower education levels and less use of preventive care practices, such as annual foot and eye exams and regular monitoring of blood sugar levels.⁶

Research suggests that the effectiveness of interventions designed to help people reduce their risk of type 2 diabetes and manage or prevent complications can vary by socioeconomic position.⁵ Healthy People 2020, the nation's agenda for improving the health of all Americans, and recent studies have identified socioeconomic position as an important factor to consider when evaluating the effectiveness of interventions.^{5,7}

Geographic Distribution of Diagnosed Diabetes in Adults

CDC's Division of Diabetes Translation works with state and local health departments, tribes, territories, health care providers, caregivers, and community organizations to identify people with diabetes and diabetes-related complications and help them manage and improve their health. Table 1 shows the percentage of US adults, by state, who reported that they have ever been told by a health care provider that they have diabetes. Estimates range from 6.4% in Colorado to 13.6% in Mississippi.



Table 1 Note: Percentages are age-adjusted to the 2000 US standard population. Data sources: Centers for Disease Control and Prevention, United States Diabetes Surveillance System and National Health Interview Survey.

Table 1. Percentage of US Adults Aged 18 or Older With Diagnosed Diabetes, by State, 2015

State	Percentage
All States (Median)	9.1
Alabama	12.0
Alaska	7.8
Arizona	9.1
Arkansas	11.2
California	9.6
Colorado	6.4
Connecticut	8.1
Delaware	9.9
District of Columbia	9.3
Florida	9.3
Georgia	10.7
Hawaii	7.8
Idaho	7.3
Illinois	9.1
Indiana	10.5
Iowa	7.7
Kansas	8.9
Kentucky	12.1
Louisiana	11.8
Maine	8.2
Maryland	9.4
Massachusetts	8.0
Michigan	9.5
Minnesota	6.9
Mississippi	13.6
Missouri	10.2
Montana	6.7
Nebraska	8.0
Nevada	9.0
New Hampshire	6.8
New Jersey	7.9
New Mexico	10.5
New York	8.9
North Carolina	9.6
North Dakota	8.1
Ohio	9.5
Oklahoma	10.7
Oregon	9.6
Pennsylvania	8.8
Rhode Island	7.9
South Carolina	10.5
South Dakota	8.4
Tennessee	11.4
Texas	11.2
Utah	7.5
Vermont	7.1
Virginia	9.6
Washington	7.7
West Virginia	12.5
Wisconsin	7.4
Wyoming	7.6

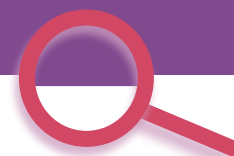
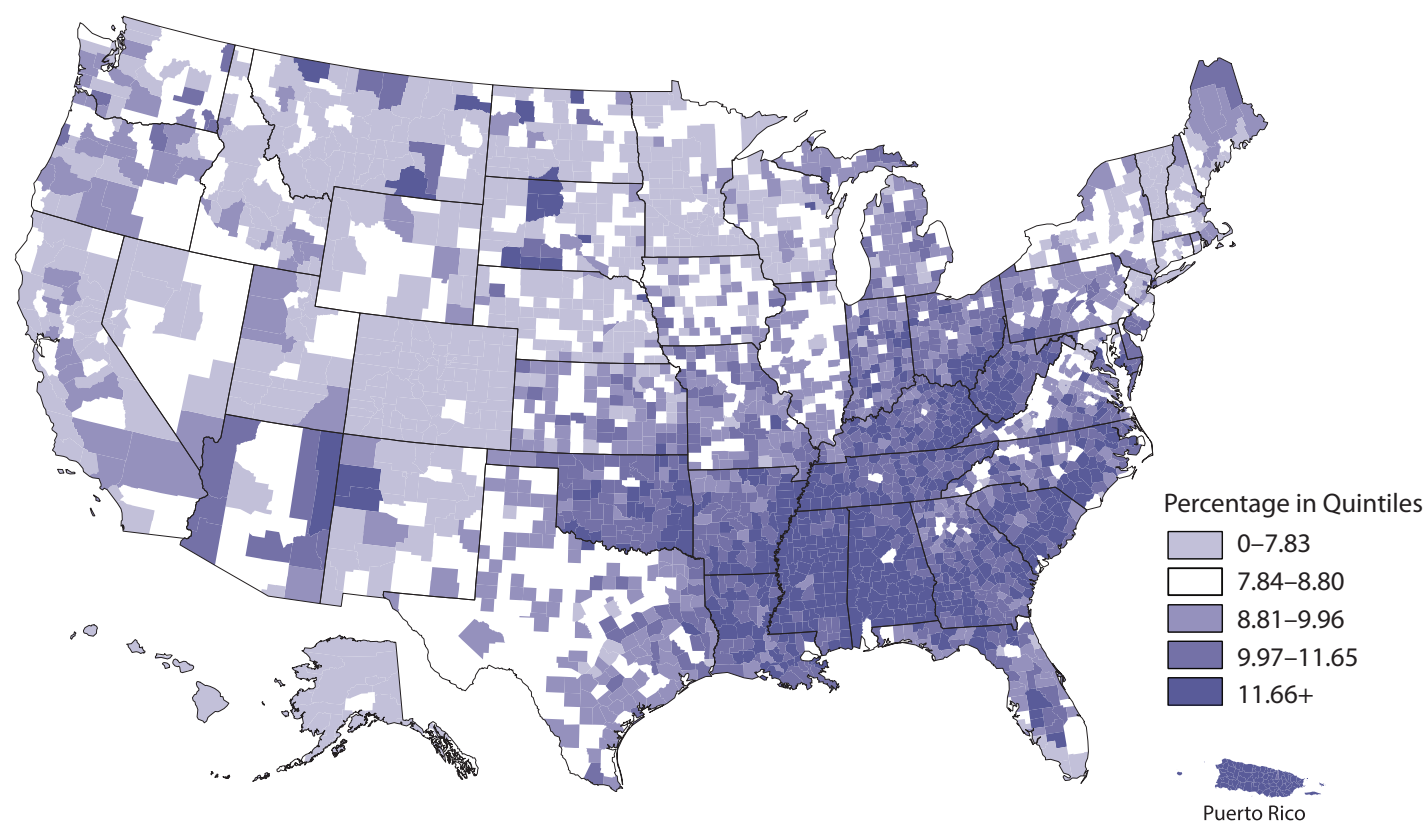


Figure 4 shows the geographic distribution of diagnosed diabetes in adults across US counties in 2013. Percentages are generally higher in the Southeast. Southern and Appalachian portions of the United States have the highest prevalence. County-level data can help researchers and public health officials identify and work to reduce gaps in diabetes

care. Although ADA-recognized or AADE-accredited DSMES programs are offered in 56% of counties across the United States, 62% of rural counties do not have a DSMES program. DSMES programs can help people with diabetes improve their health and reduce their risk of complications.⁴

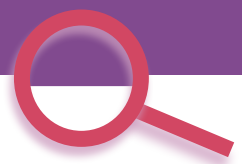
Figure 4. County-Level Distribution of Diagnosed Diabetes Among US Adults Aged 20 or Older, 2013



Note: Percentages are age-adjusted to the 2000 US standard population.

Data source: United States Diabetes Surveillance System.

See current data at www.cdc.gov/diabetes/data/countydata/countydataindicators.html.

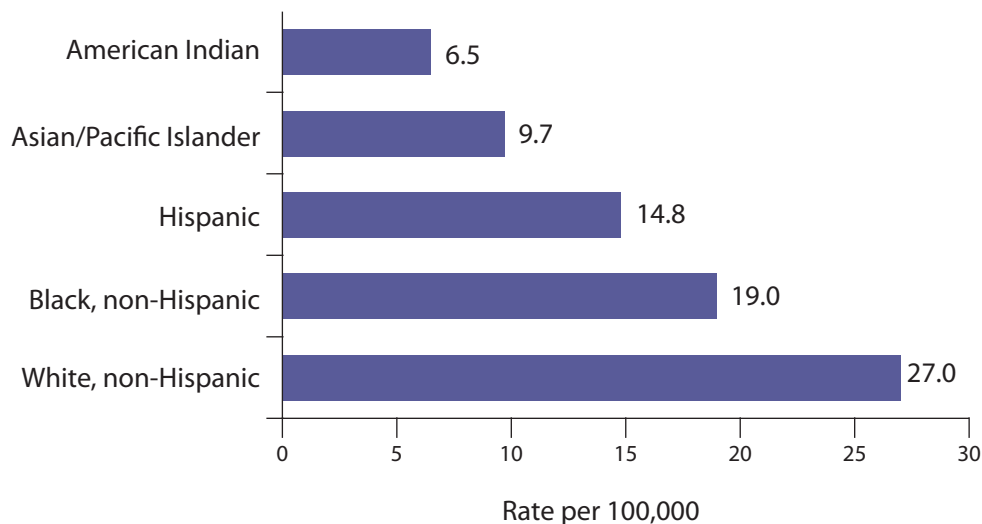


Of the estimated 23 million people with diagnosed diabetes in 2015, about 193,000 were children and adolescents younger than age 20.³ The increasing frequency of both type 1 and type 2 diabetes in young people is a growing clinical and public health concern. Since 2000, CDC and the National Institutes of Health have funded the [SEARCH for Diabetes in Youth Study](#). This multicenter study is designed to learn more about type 1 and type 2 diabetes among children and young adults in the United States.

Early findings from the SEARCH study indicated that the prevalence of both type 1 and type 2 diabetes

increased among young people during 2001–2009.⁸ Later findings indicated that incidence also went up during 2002–2012. The annual relative increase for type 1 diabetes was 1.8%, while the increase for type 2 diabetes was 4.8%. About 17,900 children and adolescents younger than age 20 were newly diagnosed with type 1 diabetes during 2011–2012, with the highest rate of new cases among non-Hispanic whites (Figure 5). About 5,300 young people aged 10 to 19 years were newly diagnosed with type 2 diabetes during 2011–2012, and those who were members of racial or ethnic minority groups had the highest rates of new cases (Figure 6).⁹

Figure 5. Incidence of Type 1 Diabetes Among US Children and Adolescents Aged 0 to 19 Years, by Race/Ethnicity, 2011–2012



Note: American Indian youth who participated in the SEARCH study are not representative of all American Indian youth in the United States. Thus, these rates cannot be generalized to all American Indian youth nationwide.
Data source: SEARCH for Diabetes in Youth Study.



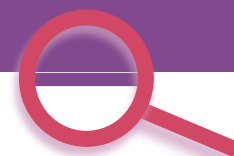
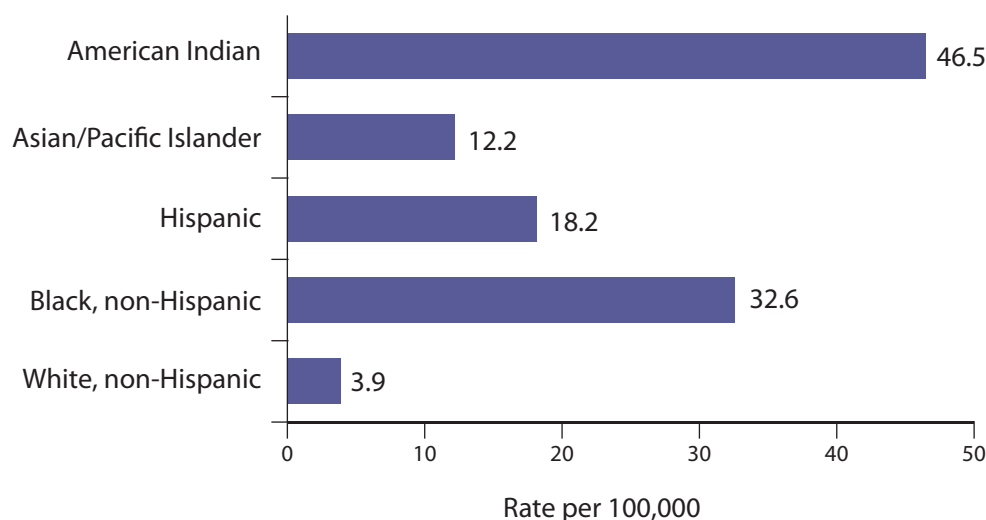


Figure 6. Incidence of Type 2 Diabetes Among US Children and Adolescents Aged 10 to 19 Years, by Race/Ethnicity, 2011–2012

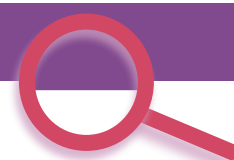


Note: American Indian youth who participated in the SEARCH study are not representative of all American Indian youth in the United States. Thus, these rates cannot be generalized to all American Indian youth nationwide.
Data source: SEARCH for Diabetes in Youth Study.

The SEARCH study also found that deaths from diabetes among all US children and adolescents aged 1 to 19 years went down, from 265 during 2000–2002 to 228 during 2012–2014. Although diabetes deaths among children and adolescents went down over time, the death rate among non-Hispanic black children and adolescents was about twice as high compared to

non-Hispanic white children and adolescents during 2012–2014. Additional research to identify health care factors and behaviors that contribute to diabetes deaths among children and adolescents may help public health officials understand the reasons for differences by race or ethnicity so they can focus their future prevention efforts more effectively.¹⁰

PREVENTIVE CARE PRACTICES



Diabetes-related complications can be serious, costly, and deadly. They include heart disease, stroke, kidney damage (chronic kidney disease and kidney failure), blindness, and amputations of the legs and feet. Diabetes-related complications are more likely and more severe among people whose diabetes is not well managed and those who have had diabetes longer.

People with diabetes can better manage their condition and improve their health by following preventive care practices. These practices include receiving annual foot and eye exams and attending

diabetes self-management classes. Table 2 presents estimates of the percentage of US adults aged 18 or older with diagnosed diabetes who reported receiving recommended preventive care practices by state.

Healthy People 2020 monitors progress toward increasing the percentage of people with diagnosed diabetes who follow preventive care practices. Table 3 shows the Healthy People 2020 target percentages for each practice and the all-states median percentages for each practice during 2011–2015.

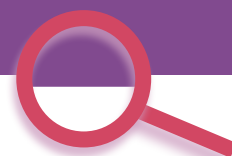


Table 2. Percentage of US Adults Aged 18 or Older With Diagnosed Diabetes Who Reported Receiving Recommended Preventive Care Practices, by State, 2015

State	Two or more A1c Tests in the Last Year	Foot Exam by Health Professional in the Last Year	Ever Attended Diabetes Self-Management Class	Dilated Eye Exam in the Last Year	Daily Self-Monitoring of Blood Glucose
Alabama ^a	69.6	69.7	53.4	60.6	69.2
Alaska ^b	62.2	76.1	59.0	57.4	68.3
Arizona	66.8	66.0	49.9	61.5	64.1
Arkansas ^a	53.3	61.4	50.6	57.9	67.4
California	63.9	62.9	64.5	59.7	42.7
Colorado	63.2	67.9	54.4	61.1	55.6
Connecticut	74.8	72.8	47.7	64.6	61.1
Delaware	72.2	78.6	48.5	63.4	59.4
District of Columbia	71.5	79.1	53.0	66.1	72.0
Florida	74.4	52.4	45.2	62.1	62.2
Georgia	63.5	65.2	52.9	65.6	61.3
Hawaii	73.4	74.4	58.4	68.6	51.7
Idaho ^c	NA ^c	NA	NA	NA	NA
Illinois	67.9	74.2	61.4	61.5	70.2
Indiana	73.1	70.6	59.2	49.8	64.2
Iowa	78.7	79.3	65.2	64.1	65.9
Kansas	71.4	69.6	59.8	64.6	58.7
Kentucky	74.5	69.3	50.0	61.2	64.5
Louisiana	64.8	62.5	46.1	56.5	56.7
Maine ^b	77.3	80.8	59.3	60.6	60.7
Maryland	75.4	75.7	59.0	61.9	65.9
Massachusetts ^a	73.4	72.0	45.8	76.7	70.1
Michigan	65.7	71.6	60.0	62.9	64.3
Minnesota	75.4	81.4	69.1	74.4	64.8
Mississippi ^b	65.1	62.1	45.0	58.9	59.7
Missouri ^a	66.1	57.1	65.9	60.7	61.8
Montana ^b	72.8	82.7	63.1	56.1	41.6
Nebraska	69.1	66.0	59.5	61.9	59.5
Nevada	69.6	74.1	74.0	65.3	75.9
New Hampshire	80.0	86.4	60.2	66.6	58.4
New Jersey	65.8	61.1	42.7	58.0	60.0
New Mexico	73.6	75.9	48.1	61.2	65.5
New York	77.3	71.5	34.8	67.0	56.1
North Carolina	80.5	77.6	62.5	61.6	73.4
North Dakota ^b	66.1	82.7	66.8	58.0	65.5
Ohio ^b	68.1	68.6	63.9	60.0	64.1
Oklahoma	65.0	66.0	51.1	55.1	72.9
Oregon ^a	67.1	73.2	56.1	54.9	57.7
Pennsylvania	73.3	81.0	50.5	69.0	63.7
Rhode Island	80.3	76.8	56.8	60.7	70.9
South Carolina	69.2	63.9	54.1	56.5	62.1
South Dakota ^b	76.8	68.0	62.9	67.9	53.0
Tennessee	67.2	60.0	48.8	52.6	65.2
Texas	59.7	62.9	59.3	59.2	57.5

Table 2 continued on next page

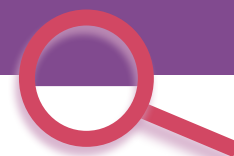


Table 2, continued

State	Two or more A1c Tests in the Last Year	Foot Exam by Health Professional in the Last Year	Ever Attended Diabetes Self-Management Class	Dilated Eye Exam in the Last Year	Daily Self-Monitoring of Blood Glucose
Utah	69.8	71.2	60.4	57.9	60.4
Vermont	71.6	72.8	45.7	66.7	67.5
Virginia	69.4	72.7	53.7	64.9	52.9
Washington	71.4	74.2	63.1	58.7	63.0
West Virginia ^b	77.9	70.1	54.6	54.8	71.1
Wisconsin	72.1	71.6	66.9	71.6	64.8
Wyoming	69.5	60.3	52.4	61.0	65.3

Note: Percentages are age-adjusted to the 2000 US standard population.

Data source: Centers for Disease Control and Prevention, United States Diabetes Surveillance System and National Health Interview Survey.

^a Data for 5 states are from 2013 because 2014 and 2015 data were not available.

^b Data for 8 states are from 2014 because 2015 data were not available.

^c Data for Idaho were not available for 2013, 2014, or 2015.

Table 3. Healthy People 2020 Targets and All-States Median Percentages of US Adults Aged 18 or Older With Diagnosed Diabetes Who Reported Receiving Recommended Preventive Care Practices, 2011–2015

Year	Two or more A1c Tests in the Last Year	Foot Exam by Health Professional in the Last Year	Ever Attended Diabetes Self-Management Class	Dilated Eye Exam in the Last Year	Daily Self-Monitoring of Blood Glucose
Healthy People 2020 Target	71.1	74.8	62.5	58.7	70.4
2011	68.8	70.8	56.3	60.1	64.2
2012	69.1	69.1	55.3	59.7	63.5
2013	67.3	69.2	55.8	59.5	64.1
2014	68.0	68.0	55.3	58.8	63.5
2015	71.4	71.6	54.4	61.6	63.0

Notes: Percentages are age-adjusted to the 2000 US standard population. Percentages in bold meet or exceed the Healthy People 2020 target.

Data sources: Centers for Disease Control and Prevention, United States Diabetes Surveillance System and National Health Interview Survey.

The only recommended practice that consistently met or exceeded the Healthy People 2020 target was the dilated eye exam. In 2015, the goal of having two or more A1c tests in the last year was also met. The all-states median percentage for ever attending a diabetes self-management class was the lowest among all of the preventive care practices. DSMEs programs can increase the use of preventive care services, help improve quality of life for people with diabetes, and reduce health care costs by lowering the risk of complications.¹¹ However, barriers such as not having insurance coverage and living in a rural area can make it hard for some people to participate. To address gaps in diabetes preventive care, more research may help find new ways to overcome the challenges that prevent people from accessing DSMEs programs.⁴

Additional national and state data are available in the [United States Diabetes Surveillance System](#). This interactive web application allows users to view data in the form of customized maps, charts, and tables on desktop and mobile devices. The [Healthy People 2020 Diabetes](#) website provides additional diabetes-specific objectives and recommended practices.

In addition to the number of people who already have diabetes, CDC estimates that 84.1 million US adults aged 18 years or older had prediabetes in 2015. With prediabetes, blood sugar levels are higher than normal but not high enough for a diabetes diagnosis. Prediabetes can increase a person's risk of type 2 diabetes, heart disease, and stroke. Although an estimated 33.9% of US adults had prediabetes in 2015, only 11.6% were aware of it.³ Table 4 shows the percentage of US adults, by state, who said they have ever been told by a health care professional that they have prediabetes.



Table 4. Percentage of US Adults Who Have Ever Been Told by a Health Care Professional That They Have Prediabetes, by State, 2015

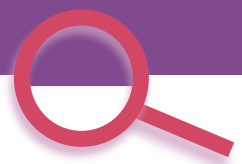
State	Percentage
All-States Median^a	7.0
Alabama	6.1
Alaska	6.6
Arizona ^b	7.6
Arkansas ^c	5.4
California ^b	8.2
Colorado ^b	6.3
Connecticut ^b	6.1
Delaware ^b	6.9
District of Columbia	9.2
Florida	7.3
Georgia	6.8
Hawaii ^b	14.0
Idaho ^b	7.8
Illinois ^b	5.8
Indiana ^b	6.4
Iowa ^b	6.6
Kansas ^b	5.5
Kentucky	6.7
Louisiana	7.1
Maine	6.9
Maryland ^b	8.4
Massachusetts ^b	5.7
Michigan ^b	6.8
Minnesota ^b	6.2
Mississippi ^b	6.1
Missouri ^b	6.9
Montana ^c	5.8
Nebraska ^b	5.4
Nevada ^b	7.4
New Hampshire ^c	5.5
New Jersey ^b	7.4
New Mexico	7.1
New York	6.8
North Carolina	7.2
North Dakota ^b	6.1
Ohio	6.1
Oklahoma	7.1
Oregon ^b	8.0
Pennsylvania ^b	6.0
Rhode Island ^b	5.7
South Carolina	7.1
South Dakota	5.5
Tennessee	7.3
Texas	6.4
Utah ^c	5.7
Vermont ^b	4.8
Virginia	6.9
Washington	7.0
West Virginia	7.6
Wisconsin ^b	6.4
Wyoming ^b	5.5

Table 4 Note: Percentages are age-adjusted to the 2000 US standard population.

^a State median calculated with 2015 data only.

^b Data from 27 states are from 2014 because 2015 data were not available.

^c Data from 4 states are from 2013 because 2014 and 2015 data were not available.



CDC works to prevent or delay type 2 diabetes by expanding the reach of the National Diabetes Prevention Program (National DPP). This evidence-based intervention teaches participants how to make healthy lifestyle changes that can reduce their risk of developing type 2 diabetes. Since the National DPP was established in 2010, over 1,500 organizations have joined the CDC Diabetes Prevention Recognition Program to deliver the National DPP. More than 100,000 people at high risk of developing type 2 diabetes have participated in lifestyle change programs across the United States.

As of 2016, over 3 million state employees in 11 states have health insurance coverage for the National DPP. About 65 private insurance companies provide some form of coverage for the program. In 2016, the National DPP became the first preventive service program to become

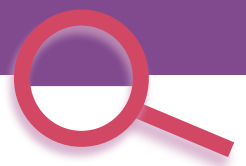


eligible for Medicare payment. About 22 million US adults with prediabetes aged 65 or older could directly benefit from the new Medicare Diabetes Prevention Program, which will take effect in 2018.

In 2016, CDC, the American Diabetes Association, and the American Medical Association partnered with the Ad Council to develop the first national prediabetes awareness campaign. This campaign was designed to help people understand their risk of prediabetes and take steps to prevent or delay the onset of type 2 diabetes.

Public service announcements in English and Spanish encourage people to visit the DoIHavePrediabetes.org website to find out their prediabetes risk. The website features a short quiz, lifestyle tips, and links to CDC-recognized National DPP programs across the country. More than 1 million people have completed the prediabetes risk test.





CDC and its partners have developed several tools to help employers, insurers, health care providers, and states assess the effect of diabetes on their communities and populations of interest. These tools can be used to calculate the economic costs of the disease, evaluate the benefits of implementing the National DPP, and review existing policies related to education and management of diabetes.

Diabetes Prevention Impact Toolkit

CDC developed the [Diabetes Prevention Impact Toolkit](#) to help employers, insurers, providers, and state health departments estimate the health and economic effects of offering the National DPP lifestyle change program to populations at risk of developing type 2 diabetes.¹²

Health Insurance Coverage Laws for Diabetes Self-Management Education and Training

The interactive [Health Insurance Coverage Laws for Diabetes Self-Management and Training](#) website summarizes information about US public and private

insurance policies that require diabetes self-management education and training (DSME/T) for patients with diabetes. The website includes fact sheets about each state's insurance coverage for DSME/T.¹³

Diabetes State Burden Toolkit

The [Diabetes State Burden Toolkit](#) provides state estimates of diabetes burden (prevalence, incidence, and related conditions), economic costs, and deaths. It also presents data about diabetes-related complications; healthy life years lost; and costs related to medical care, absence from work, and lost household productivity.¹⁴

National Diabetes Prevention Program Coverage Toolkit

The [National Diabetes Prevention Program Coverage Toolkit](#) was developed to support Medicaid, Medicare Advantage, and commercial health plans that are considering covering or implementing the National DPP lifestyle change program.¹⁵

The estimates in this report were calculated by staff from CDC's Division of Diabetes Translation and are available in more detail in CDC's [National Diabetes Statistics Report, 2017](#) and from the United States Diabetes Surveillance System. Diabetes data are from the US Census Bureau, the Indian Health Service's National Patient Information Reporting System, and various surveys and data collection systems. These systems include the Behavioral Risk Factor Surveillance System (BRFSS), the National Health Interview Survey, the National Hospital Discharge Survey, and the National Vital Statistics System. To make meaningful comparisons between states and over time, we used the

2000 US standard population to age-adjust our estimated rates. Age adjustment is a statistical process applied to rates of diseases, injuries, and health outcomes. It allows comparisons between communities with different age structures because it proportions rates to a standard age structure. Three-year moving averages are sometimes used to improve the precision of estimates. State estimates in this report card are based on BRFSS data. Because of the limitations of self-reported data in surveys, these estimates may underreport the rates of diagnosed diabetes and prediabetes in the US population.

- Centers for Disease Control and Prevention. Division of Diabetes Translation website. Reports to Congress. <https://www.cdc.gov/diabetes/library/reports/congress.html>. Accessed September 20, 2017.
- Patient Protection and Affordable Care Act of 2009. Pub. L No. 111-148, Title X, Sec 10407, 42 USC 247b-9a.
- Centers for Disease Control and Prevention. [National Diabetes Statistics Report, 2017](#). Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2017.
- Rutledge SA, Masalovich S, Blacher RJ, Saunders MM. [Diabetes self-management education programs in nonmetropolitan counties — United States, 2016](#). *MMWR Surveill Summ*. 2017;66(10):1–6.
- Beckles GL, Chou C. [Disparities in the prevalence of diagnosed diabetes — United States, 1999–2002 and 2011–2014](#). *MMWR Morb Mortal Wkly Rep*. 2016;65(45):1265–1269.
- Luo H, Beckles GL, Zhang X, Sotnikov S, Thompson T, Bardenheier B. [The relationship between county-level contextual characteristics and use of diabetes care services](#). *J Public Health Manag Pract*. 2014;20(4):401–410.
- US Department of Health and Human Services. Healthy People 2020 website. Social Determinants of Health. <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>. Accessed September 1, 2017.
- Dabelea D, Mayer-Davis EJ, Saydah S, et al. [Prevalence of type 1 and type 2 diabetes among children and adolescents from 2001 to 2009](#). *JAMA*. 2014;311(17):1778–1786.
- Mayer-Davis EJ, Lawrence JM, Dabelea D, et al. [Incidence trends in type 1 and type 2 among youths, 2002–2012](#). *N Engl J Med*. 2017;376:1419–1429.
- Saydah S, Imperatore G, Cheng Y, Geiss LS, Albright A. [Disparities in diabetes deaths among children and adolescents — United States, 2000–2014](#). *MMWR Morb Mortal Wkly Rep*. 2017;66(19):502–505.
- Powers MA, Bardsley J, Cypress M, et al. [Diabetes self-management education and support in type 2 diabetes: a joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics](#). *J Acad Nutr Diet*. 2015;115(8):1323–1334.
- Centers for Disease Control and Prevention. Diabetes Prevention Impact Toolkit website. <https://nccd.cdc.gov/Toolkit/DiabetesImpact>. Accessed May 25, 2017.
- The Policy Surveillance Program and ChangeLab Solutions. Health Insurance Coverage Laws for Diabetes Self-Management Education and Training website. <http://lawatlas.org/datasets/diabetes-self-management-education-laws>. Accessed May 25, 2017.
- Centers for Disease Control and Prevention. Diabetes State Burden Toolkit website. <https://nccd.cdc.gov/Toolkit/DiabetesBurden>. Accessed May 25, 2017.
- National Association of Chronic Disease Directors. National Diabetes Prevention Program Coverage Toolkit website. <http://www.nationaldppcoveragetoolkit.org/>. Accessed July 13, 2017.



Best Practices for Cardiovascular Disease Prevention Programs

A Guide to Effective Health Care System
Interventions and Community Programs
Linked to Clinical Services



Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention
and Health Promotion
Division for Heart Disease and Stroke Prevention

Acknowledgments

This guide was developed by the Division for Heart Disease and Stroke Prevention (DHDSP) in the Centers for Disease Control and Prevention (CDC).

DHDSP also gratefully acknowledges the contributions provided by the following external reviewers:

American Heart Association

Jill Ceitlin, MPH*

Laurie Whitsel, PhD*

Association of State and Territorial Health Officials

Elizabeth Romero, MS

Feinberg School of Medicine, Northwestern University

Darwin Labarthe, MD, MPH, PhD*

Georgia State University, School of Public Health

Terry Pechacek, PhD

Maine Cardiovascular Health Program

Holly Richards, MPH

Minnesota Department of Health

Stanton B. Shanedling, PhD, MPH

National Association of Chronic Disease Directors

Kathleen Foell, MS*

MaryCatherine Jones, MPH

Miriam Patanian, MPH*

National Association of Community Health Centers

Margaret Meador, MPH

National Association of County and City Health Officials

Erica Haller-Stevenson, MPH

Nevada Division of Public and Behavioral Health

Victoria Kolar, EMT-P

Oklahoma State Department of Health

Joyce Lopez, RN, MS, BSN*

Jon Lowry, MPH

* Denotes participation as an independent peer reviewer in CDC's Influential Scientific Information review process.

Suggested Citation

Centers for Disease Control and Prevention. *Best Practices for Cardiovascular Disease Prevention Programs: A Guide to Effective Health Care System Interventions and Community Programs Linked to Clinical Services*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2017.

Website addresses of nonfederal organizations are provided solely as a service to our readers. Provision of an address does not constitute an endorsement by the Centers for Disease Control and Prevention (CDC) or the federal government, and none should be inferred. CDC is not responsible for the content of other organizations' web pages.

Contents

Executive Summary	4
Introduction	6
Background	7
Domains of Chronic Disease Prevention and Health Promotion	7
Domain 1: Epidemiology and Surveillance	7
Domain 2: Environmental Approaches	7
Domain 3: Health Care System Interventions	7
Domain 4: Community Programs Linked to Clinical Services	7
Focus of the <i>Best Practices Guide for CVD Prevention</i>	8
Health Care System Interventions (Domain 3)	8
Community Programs Linked to Clinical Services (Domain 4)	8
Intended Audience	8
Guide Development	9
Best Practices Framework	9
Other Guiding Frameworks	9
Interpreting the Results: Best Practice Strategy Template	10
Limitations of This Guide	14
Domain 3: Effective Strategies in Health Care System Interventions	16
Promoting Team-Based Care to Improve Hypertension Control	18
Pharmacy: Collaborative Practice Agreements to Enable Collaborative Drug Therapy Management	23
Self-Measured Blood Pressure Monitoring with Clinical Support	28
Self-Management Support and Education	33
Reducing Out-of-Pocket Costs for Medications	38
Implementing Clinical Decision Support Systems	43
Domain 4: Effective Strategies in Community Programs Linked to Clinical Services	48
Integrating Community Health Workers on Clinical Care Teams and in the Community	50
Community Pharmacists and Medication Therapy Management	55
Appendix	60
Appendix A. Summary of Effective CVD Prevention Strategies	61
Appendix B. Rapid Synthesis and Translation Process	62
Appendix C. Understanding the Continuum of Evidence of Effectiveness Tool	64
Appendix D. Glossary	70

Executive Summary

Heart disease is the leading cause of death in men and women in the United States. Together, heart disease, stroke, and other vascular diseases claim over 800,000 lives each year.^{1,2} An estimated one in every seven US dollars spent on health care goes toward cardiovascular disease (CVD), totaling over \$300 billion in annual health care costs and lost productivity from premature death each year.^{3,4} Several modifiable risk factors for CVD are well known, including hypertension, hyperlipidemia, smoking, being overweight, being inactive, and eating an unhealthy diet. Although treatments for hypertension and hyperlipidemia are very effective and relatively inexpensive, most people with these conditions do not have them under control.

Although individuals can take steps to reduce their own risks of CVD, public health approaches have the potential to reduce risks among entire populations. Changes to policies, practices, and health systems that are designed to lower uncontrolled high blood pressure and cholesterol levels among populations can significantly improve access to health care, quality of care, and patient adherence to treatments.

The Centers for Disease Control and Prevention's Division for Heart Disease and Stroke Prevention (DHDSP) is guided by its mission to provide public health leadership to improve cardiovascular health for all, reduce the burden of CVD, and eliminate disparities associated with heart disease and stroke.

DHDSP supports all 50 states and the District of Columbia to work toward achieving this mission, which aligns with the National Center for Chronic Disease Prevention and Health Promotion's (NCCDPHP's) approach to preventing chronic disease through four key domains^{5,6}:

- **Domain 1:** Epidemiology and Surveillance.
- **Domain 2:** Environmental Approaches.
- **Domain 3:** Health Care System Interventions.
- **Domain 4:** Community Programs Linked to Clinical Services.

Because resources are limited and the need to prevent CVD is widespread, decision makers and public health professionals must choose strategies that are effective and sustainable.

Because resources are limited and the need to prevent CVD is widespread, decision makers and public health professionals must choose strategies that are effective and sustainable. The four domains provide a framework for these efforts, and scientific evidence can help guide decisions about which strategies to adopt. In this publication, *Best Practices for Cardiovascular Disease Prevention Programs: A Guide to Effective Health Care System Interventions and Community Programs Linked to Clinical Services* (hereafter called the *Best Practices Guide for CVD Prevention*), we describe and summarize scientific evidence behind effective strategies for lowering high blood pressure and cholesterol levels that can be implemented in health care systems (Domain 3) and that involve community programs linked to clinical services (Domain 4). Following the best practices framework put forth by a CDC work group⁷ and using a translation tool called the Continuum of Evidence of Effectiveness,^{8,9} we have reviewed, identified, and summarized the evidence behind strategies that can be considered best practices for controlling hypertension and hyperlipidemia.

The target audience for this publication includes state and local health departments, decision makers, public health professionals, and other stakeholders interested in using proven strategies to improve cardiovascular health. This publication is not intended as comprehensive guidance, but rather a high-level, supportive resource. Our intention is to present brief, easy-to-follow evidence summaries for effective blood pressure and cholesterol control strategies and to highlight available resources and tools useful for implementing these strategies.

Highlighted strategies include the following:

- Using a team-based care model.
- Elevating pharmacy involvement in patient care.
- Including community health workers on clinical care teams.
- Activating patient involvement through self-management.
- Using clinical decision support systems.
- Reducing out-of-pocket costs for medications.

These strategies were identified through the recommendations of end users, grantees, evaluators, content subject matter experts, and program specialists, and they are based on the priorities of DHDSP. Each of the selected strategies was vetted by a DHDSP work group, and evidence was reviewed by people with expertise in research methods, program delivery, and the proposed strategies. To be included in the *Best Practices Guide for CVD Prevention*, strategies had to be supported by multiple high-quality research studies that demonstrated evidence of effectiveness in controlling blood pressure or cholesterol levels. In this publication, we describe the strength of evidence behind each strategy and the reported outcomes related to CVD prevention. We also highlight the public health and economic impacts of each strategy, including whether it improves health or reduces health disparities.

In addition, we highlight important issues related to the implementation of each strategy, including settings in which the strategies have been implemented, resources available to support implementation, and policy and law-related considerations. Brief synopses, called Stories from the Field, highlight specific locations where the strategies have been successfully implemented.

This publication also provides several appendices with additional information. [Appendix A](#) provides a summary of the evidence of effectiveness for each strategy. [Appendix B](#) explains the Rapid Synthesis and Translation Process, which was one of the methods used to develop this publication. [Appendix C](#) provides details about the Continuum of Evidence of Effectiveness, which is an interactive, online tool that was used to assess and rate the strength of evidence for each strategy. [Appendix D](#) is a glossary of important terms used in this publication.

References

1. Xu J, Murphy SL, Kochanek KD, Arias E. Mortality in the United States, 2015. *NCHS Data Brief*. 2016;267.
2. Centers for Disease Control and Prevention. Underlying Cause of Death 1999–2015. CDC WONDER Online Database. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2016. <http://wonder.cdc.gov/ucd-icd10.html>. Accessed February 3, 2017.
3. Agency for Healthcare Research and Quality. Medical Expenditure Panel Survey website. Table 7: Total Expenses and Percent Distribution for Selected Conditions by Type of Service: United States, Average Annual 2012–2013. https://meps.ahrq.gov/mepsweb/data_stats/tables_compedia_hh_in-teractivejsp?SERVICE=MEPSPSocket0&PROGRAM=MEPSPGMTCSAS&File=H-C2Y2013&Table=C2Y2013%5FCNDX-P%5FC&_Debug. Accessed May 19, 2017.
4. Benjamin EJ, Blaha MJ, Chiuve SE, et al. Heart disease and stroke statistics—2017 update: a report from the American Heart Association. *Circulation*. 2017;135:e1–e458.
5. Centers for Disease Control and Prevention. *The Four Domains of Chronic Disease Prevention: Working Toward Healthy People in Healthy Communities*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2016.
6. Bauer UE, Briss PA, Goodman RA, Bowman BA. Prevention of chronic disease in the 21st century: elimination of the leading preventable causes of premature death and disability in the USA. *Lancet*. 2014;384(9937):45–52.
7. Spencer LM, Schooley MW, Anderson LA, et al. Seeking best practices: a conceptual framework for planning and improving evidence-based practices. *Prev Chronic Dis*. 2013;10:130186. doi: <http://dx.doi.org/10.5888/pcd10.130186>.
8. Thigpen S, Puddy RW, Singer HH, Hall DM. Moving knowledge into action: developing the Rapid Synthesis and Translation Process within the Interactive Systems Framework. *Am J Community Psychol*. 2012;50(3–4):285–294.
9. Puddy RW, Wilkins N. *Understanding Evidence Part 1: Best Available Research Evidence. A Guide to the Continuum of Evidence of Effectiveness*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2011.

Introduction

Public health strategies to detect, prevent, and control chronic disease can be implemented at many levels, from individual behavioral interventions to environmental or cultural strategies affecting entire communities. Making changes to health system practices can eliminate barriers to quality care and improve the health of many people. Nowhere is the need for such approaches more apparent than in the efforts to prevent heart disease, the leading cause of death in men and women in the United States. Although treatments for hypertension and hyperlipidemia—two key risk factors for cardiovascular disease (CVD)—are very effective and relatively inexpensive, most people with these conditions do not have them under control. Research on strategies to lower blood pressure and cholesterol levels in health care settings offers insights about effective practices, but more work is needed to translate this evidence into action.

[The Best Practices Guide for CVD Prevention] highlights strategies that have been found to be effective for widespread control of hypertension and hyperlipidemia, but which are not yet being used widely as standard practice.

This publication, *Best Practices for Cardiovascular Disease Prevention Programs: A Guide to Effective Health Care System Interventions and Community Programs Linked to Clinical Services* (hereafter called the *Best Practices Guide for CVD Prevention*), is intended as a translation resource. It highlights strategies that have been found to be effective for widespread control of hypertension and hyperlipidemia, but which are not yet being used widely as standard practice.

Together, heart disease, stroke, and other vascular diseases claim over 800,000 lives in the United States each year and cost over \$300 billion in annual health care costs and lost productivity from premature death.¹⁻³ An estimated one in every seven US dollars spent on health care goes toward CVD.^{3,4} This costly and deadly disease is at the forefront of public health priorities at the Centers for Disease Control and Prevention (CDC), and health care practitioners at many levels are looking for solutions. Several modifiable risk factors for CVD are well known, including hypertension, hyperlipidemia, smoking, being overweight, being inactive, and eating an unhealthy diet.

Identifying effective ways to directly lower high blood pressure and cholesterol in the US population is a priority for the Centers for Disease Control and Prevention's (CDC's) Division for Heart Disease and Stroke Prevention (DHDSP). Other divisions in CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) prioritize other risk factors, such as smoking, diabetes, diet, and obesity. DHDSP supports all 50 states and the District of Columbia to work toward achieving DHDSP's mission to improve cardiovascular health for all, reduce the burden of CVD, and eliminate disparities associated with heart disease and stroke.

Background

Key Domains of Chronic Disease Prevention and Health Promotion

NCCDPHP takes a multifaceted approach to chronic disease detection, prevention, and control by focusing on four key domains: epidemiology and surveillance (Domain 1), environmental approaches (Domain 2), health care system interventions (Domain 3), and community programs linked to clinical services (Domain 4).⁵

Domain 1: Epidemiology and Surveillance

Epidemiology and surveillance involves the use of systems to regularly track and monitor current and emerging trends in chronic diseases and their related risk factors. Investing in this domain allows data to be collected to understand the incidence, prevalence, and risk factors of chronic diseases; identify effective approaches for detection, prevention, and control; and monitor and assess progress toward key program goals.^{5,6} Surveillance is essential for monitoring the detection, prevention, control, and treatment of CVD. CDC uses data from communities, health systems, and administrative systems to assess the burden of CVD. CDC tracks trends in cardiovascular risk factors and disease and shares findings with partners and collaborators working to apply public health strategies to improve cardiovascular health. Grantees of CDC-funded heart disease and stroke prevention programs collect surveillance data and use this information to guide, prioritize, and monitor program delivery.

Domain 2: Environmental Approaches

Environmental approaches involve the use of policy and structural changes to create environments where health is promoted and healthy choices are reinforced. Changes can be made to social and physical environments that make healthy behaviors easier and more convenient for individuals, while maintaining broad reach and sustaining health benefits for overall populations.^{5,6} CDC and its partners are working to make healthier environments a reality for those at greatest risk for CVD. Environmental strategies that can help reduce heart attacks and strokes include creating smoke-free environments and increasing access to healthier foods, including those with less sodium.

Domain 3: Health Care System Interventions

Health care system interventions are strategies used to improve the delivery and quality of care in clinical settings. Health system and quality improvement changes, such as using electronic health records (EHRs) and requiring reporting on blood pressure control, can encourage health care providers to better monitor and address key risk factors for CVD.^{5,6} Such strategies can result in earlier detection, improved disease management, and even prevention of the onset of CVD.

Domain 4: Community Programs Linked to Clinical Services

This domain—sometimes called community-clinical links—refers to strategies that connect community programs with health systems to improve chronic disease prevention, care, and management.⁵ Because this strategy relies on links between community and clinical settings, activities often overlap Domains 3 and 4. Community-clinical links aim to ensure that people with or at high risk for chronic diseases have access to quality community resources and support to prevent, delay, or manage chronic conditions once they occur. Strategies can include referrals by clinicians to community supports to improve chronic disease self-management or referrals by community programs to clinical services.^{5,6} These links can also involve community delivery and third-party payment for effective programs, which can reduce barriers and increase adherence to clinician recommendations.

Focus of the *Best Practices Guide for CVD Prevention*

The *Best Practices Guide for CVD Prevention* focuses specifically on strategies used in Domains 3 and 4, health care systems interventions (Domain 3) and community programs linked to clinical services (Domain 4). Improvements made in these areas can help create environments where people are better able to receive quality care, make healthier choices, and take control of their health. CDC funds state and local programs and key partner organizations to put health care system interventions and community-clinical links into action to prevent CVD. See [Appendix A](#) for a summary of effective strategies within these domains.

Health Care System Interventions (Domain 3)

Examples of health care system interventions include efforts to increase identification of undiagnosed hypertension, adopt clinical hypertension protocols, improve medication adherence, increase the use of health information technology to implement the ABCS (Aspirin when appropriate, Blood pressure control, Cholesterol management, and Smoking cessation), and make other quality improvements in health care practices.

Community Programs Linked to Clinical Services (Domain 4)

Examples of activities involving community-clinical links include health care systems collaborating with community groups that provide evidence-based lifestyle programs; using community health care extenders (i.e., non-MD health care professionals) to support self-managed blood pressure; and collaborating with chronic disease programs for effective program planning, implementation, and evaluation.

Intended Audience

The *Best Practices Guide for CVD Prevention* was developed for state and local health departments, decision makers, public health professionals, and other stakeholders with an interest in implementing effective strategies to improve cardiovascular health. To develop this publication, we searched for interventions and strategies that have been found to be effective for CVD prevention in multiple research and practice settings, but which are not yet widely used or considered standard practice. For each selected strategy, we provide brief summaries of the research evidence and links to information and resources on how to implement the strategy. The information presented here is not comprehensive, but instead provides a quick reference to selected strategies. The *Best Practices Guide for CVD Prevention* can be used as a resource by decision makers and stakeholders who wish to implement CVD prevention strategies that offer the best chances for successful outcomes in their communities and health care systems. In addition to the strategy summaries, this publication provides several appendices with additional information, including a glossary of important terms ([Appendix D](#)).

Guide Development

The strategies presented in this publication were identified and confirmed through an extensive review process, with input from subject matter experts (SMEs) and practice partners both within and external to CDC. Internally, strategies were reviewed and vetted by DHDSP senior leadership and staff in DHDSP’s Program Development and Services Branch, Epidemiology and Surveillance Branch, Applied Research and Evaluation Branch, Million Hearts® team, and Office of Policy, External Relations, and Communications. Externally, we worked with academics, partners, and program directors with expertise in chronic care delivery, CVD prevention and control, and public health program management.

In addition to the review process, the *Best Practices Guide for CVD Prevention* was conceptualized and developed using several theoretical models. The concept of identifying public health best practices for hypertension and cholesterol control was primarily guided by the best practices framework developed by a CDC work group.² This framework also guided how we selected strategies, reported their impact, and offered considerations for implementation.

Best Practices Framework

According to the best practices framework (Figure 1), strategies considered best practices should be evidence-based; have high-quality evidence to support them; and demonstrate a positive impact in terms of effectiveness, reach, feasibility, sustainability, and transferability.² Where a particular practice falls on the best practices continuum at any point in time is dependent on the evidence available at that point. Thus, being labeled a “best practice” is not a static designation, but one that can change as new evidence becomes available. Practices can be categorized as emerging, promising, leading, or best.

Other Guiding Frameworks

In addition to using the best practices framework to develop this publication, we also followed a process adapted from the Rapid Synthesis and Translation Process (RSTP).⁸ For more information on RSTP, see Appendix B. RSTP provides a structure for working with SMEs and practice partners to develop an evidence-based translation product. In addition, for each strategy, two evidence reviewers used an interactive, online tool called the Continuum of Evidence of Effectiveness to assess and rate the strength of evidence for each proposed best practice.⁹ For more information about this tool, see Appendix C.

Figure 1. A Conceptual Framework for Planning and Improving Evidence-Based Practices



Interpreting the Results: Best Practice Strategy Template

We used the information collected and assessed through the review process to identify effective strategies, or best practices, for controlling blood pressure or cholesterol levels. We then summarized the evidence to support each of these strategies into a standard template. The sample template presented on the following pages describes what information is provided for each strategy and how this information is organized.



A brief description of the strategy starts each section.

This box provides a short summary of the findings for the strategy.

An example of where the strategy has been implemented is provided here.

Here we provide summary ratings indicating the strength of research evidence behind the strategy.

The reviewers used the Continuum of Evidence of Effectiveness to assess the effectiveness of each strategy according to six dimensions. The interactive continuum tool summarized their ratings for each dimension and we have summarized those results in a table like the example shown here. See Appendix A for a summary of the ratings for all strategies.

The Health Disparity Impact section describes the evidence from the research literature and provides a rationale for the rating for health disparity impact. The rating indicates whether the strategy is effective among the populations with the most need or has the potential to reduce health disparities.

Evidence of Effectiveness

The evidence base for implementing team-based care in health care systems and practices is very strong. Solid evidence exists that this strategy achieves desired outcomes, with studies demonstrating internal and external validity. This strategy has also been independently replicated, which shows reliability of impact. Several randomized controlled trials, which are often considered the gold standard in research, have been conducted and show positive results from using multidisciplinary teams as a way to improve hypertension control. Various organizations, such as the American Medical Association and the Agency for Healthcare Research and Quality (AHRQ), have developed guidelines to help health care systems and practices implement this strategy as part of their policies and protocols.

Evidence of Impact

Health Impact

A systematic review by the Community Preventive Services Task Force concluded that team-based care can lead to significantly improved hypertension control, lowered systolic and diastolic blood pressure levels (overall median reduction was 5.4 mmHg and 1.8 mmHg, respectively), and improved patient adherence to hypertensive medication.³

The evidence base for implementing team-based care in health care systems and practices is very strong.

Health Disparity Impact

Team-based care has been found to be effective when used among diverse patient populations, including those with members of different racial and ethnic groups (e.g., whites, African Americans) and among patients with multiple health conditions.

Evidence also exists that this strategy is effective among low-income populations. Additional research is needed to examine effectiveness among populations that are primarily Hispanic and in communities with other minority populations.³

Economic Impact

Team-based care has proven to be cost-effective. The median total cost for providing team-based care for hypertension control was found to be \$355 per person per year. The median cost per quality-adjusted life year (QALY) gained over 20 years was either \$10,511 or \$15,137, depending on the QALY conversion method used.⁴ Both estimates were well below the commonly used and conservative cost-effectiveness threshold of \$50,000 per QALY.

Researchers modeled the health and economic impact of nationwide adoption of team-based care for hypertension over 10 years and estimated a net cost savings to Medicare of \$5.8 billion (2012 US dollars) over this period.⁵ This model also estimates an overall national savings of \$25.3 billion in averted disease costs, which offsets an estimated \$22.9 billion cost of using this intervention to the health care system. Costs for patient time over this period are estimated at \$15.8 billion, but are largely offset by an estimated \$11 billion in productivity gains.



The Continuum of Evidence of Effectiveness is designed to assess the quality of the research evidence available, but it cannot directly assess a strategy's potential for public health impact, which is an important component of a best practices designation. To assess this component, reviewers examined the research literature for evidence of a strategy's potential to improve health, reduce health disparities, and show economic sustainability. They assigned ratings for each of these categories. These ratings are provided in a table like the example shown here.

The Health Impact section describes the evidence from the research literature and provides a rationale for the rating for health impact. The rating indicates whether the strategy achieves one or more desired outcomes related to CVD prevention—such as lowered blood pressure, increased adherence to blood pressure medication, or decreased disease and death.

The Economic Impact section describes the evidence available on a variety of economic factors, including overall cost-effectiveness; cost savings to health systems, patients, or other payers; net benefit; and return on investment (ROI). The economic impact rating reflects the degree to which evidence exists that the strategy can have a positive economic impact. Cost figures shown in this section are examples of possible impact according to the best available evidence. All costs are adjusted to 2015 US dollars using the price index for personal consumption expenditures prepared by the Bureau of Economic Analysis in the US Department of Commerce.



Stories from the Field
Team-Based Care

Team-Based Care at WinMed Health Services

WinMed Health Services, an FQHC in Cincinnati, Ohio, is a 2014 Million Hearts® Hypertension Control Champion that successfully incorporated team-based care to help achieve hypertension control among its patients. To ensure a continuum of complete patient care, WinMed's care teams include physicians, pharmacists, and behavioral and dental professionals. WinMed focuses on increasing health care providers' expertise and skills, providing opportunities for patient education, ensuring that patient care is team-based, and using registry-based information systems. The WinMed care teams use electronic health records to increase proper communication between patients and the different providers. By improving community ties and patient education, encouraging greater patient engagement, and adding pharmacists and patient assistants to the health care team, WinMed achieved a 7% increase in hypertension control among its patients from 2013 to 2014.

For more information:
Website: www.winmedinc.org/index.htm

This section describes the strategy as it is being applied in a specific community, clinical, or health care setting. It provides contact information, results and clinical outcomes, and an assessment of factors that affect implementation and sustainability. This information can be useful to state and local health departments, decision makers, public health professionals, and related stakeholders.

This section provides information about the implementation of each strategy, including settings, implementation guidance, resources, and policy and law-related considerations.

Current, high-level considerations related to policy and laws relevant to implementing the strategy.

Available resources, such as guides, examples, and guidelines that support implementation of the strategy.

Settings in which the strategy was successfully implemented.

Current implementation guidance available to assist with implementation of the strategy.

Domain 3: Health Care System Interventions
Team-Based Care



Four Considerations for Implementation

- 1 Settings**
 Team-based care has been successfully implemented in multiple settings, including Federally Qualified Health Centers (FQHCs), patient-centered medical homes, and managed health care systems, in various locations throughout the United States.
- 2 Policy and Law Related Considerations**
 Scope-of-practice laws and organizational policies that allow nurses, physician assistants, pharmacists, and other health care providers to practice to the full extent of their licensure and training can facilitate team-based care.
- 3 Implementation Guidance**
 The American Medical Association and AHRQ have developed modules for implementing team-based care:
 - [American Medical Association's STEPSforward: Implementing Team-Based Care](#),⁶
 - [Agency for Healthcare Research and Quality's Practice Facilitation Handbook](#).⁷
- 4 Resources**
 Many federal initiatives and medical institutions support team-based care approaches. Examples include the following:
 - [Centers for Disease Control and Prevention's 618 Initiative](#).⁸
 - [National High Blood Pressure Educational Program, supported by the National Heart, Lung, and Blood Institute](#).⁹
 - [American Heart Association](#).¹⁰
 - [National Academy of Medicine](#).¹⁰

Limitations of This Guide

Although the *Best Practices Guide for CVD Prevention* is a useful resource on evidence-based strategies for preventing CVD, it has several limitations. First, it does not include every strategy found to be effective in CVD prevention. Other strategies may be used in practice that are not included here because of the approach we used to select and assess the evidence. This guide focuses on practices that are best characterized in the research literature and therefore most amenable to meaningful assessment by the methods we used. Second, this publication provides only a condensed version of the evidence available on each strategy. It is not a systematic review, like *The Guide to Community Preventive Services*, and thus could be missing potentially relevant information about strategy weaknesses and research limitations. References to longer and more detailed systematic reviews and meta-analyses are provided when available.

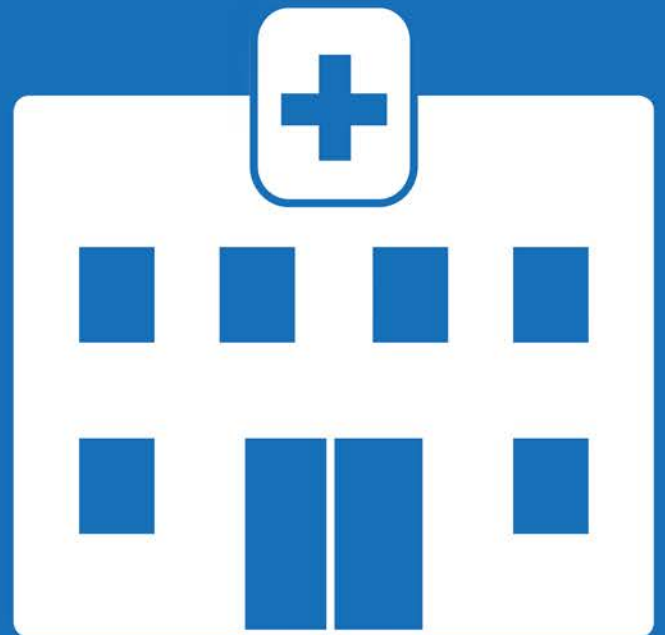
Third, our presentation of evidence is limited by the available literature. Consequently, if key data (for example, on economic factors) were not available at the time we reviewed the evidence, this information is missing. Fourth, information on the economic impact of the strategies is presented using a variety of methods, which limits the ability to make direct comparisons across practices. The numbers presented should be read only as examples of the best available evidence demonstrating positive economic impact. They should not be directly compared to examine the comparative efficiency of the different practices. Fifth, this initial version of the *Best Practices Guide for CVD Prevention* does not provide detailed information on strategy implementation or the estimated costs of implementation. Although we have provided links to available implementation resources when possible, providing complete implementation guidance for each strategy was beyond the scope of this publication. Such information may be included, to the extent possible, in future versions.

References

1. Xu J, Murphy SL, Kochanek KD, Arias E. Mortality in the United States, 2015. *NCHS Data Brief*. 2016;267.
2. Centers for Disease Control and Prevention. Underlying Cause of Death 1999-2015. CDC WONDER Online Database. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2016. <http://wonder.cdc.gov/ucd-icd10.html>. Accessed February 3, 2017.
3. Agency for Healthcare Research and Quality. Medical Expenditure Panel Survey website. Table 7: Total Expenses and Percent Distribution for Selected Conditions by Type of Service: United States, Average Annual 2012-2013. https://meps.ahrq.gov/mepsweb/data_stats/tables_compendia_hh_interactive.jsp?_SERVICE=MEPSSocket0&PROGRAM=MEPSPGM.TC.SAS&File=HC2Y2013&Table=HC2Y2013%5FCNDXP%5FC&_Debug. Accessed May 19, 2017.
4. Benjamin EJ, Blaha MJ, Chiuve SE, et al. Heart disease and stroke statistics—2017 update: a report from the American Heart Association. *Circulation*. 2017;135:e1–e458.
5. Centers for Disease Control and Prevention. *The Four Domains of Chronic Disease Prevention: Working Toward Healthy People in Healthy Communities*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2016.
6. Bauer UE, Briss PA, Goodman RA, Bowman BA. Prevention of chronic disease in the 21st century: elimination of the leading preventable causes of premature death and disability in the USA. *Lancet*. 2014;384(9937):45–52.
7. Spencer LM, Schooley MW, Anderson LA, et al. Seeking best practices: a conceptual framework for planning and improving evidence-based practices. *Prev Chronic Dis*. 2013;10:130186. doi: <http://dx.doi.org/10.5888/pcd10.130186>.
8. Thigpen S, Puddy RW, Singer HH, Hall DM. Moving knowledge into action: developing the Rapid Synthesis and Translation Process within the Interactive Systems Framework. *Am J Community Psychol*. 2012;50(3-4):285–294.
9. Puddy RW, Wilkins N. *Understanding Evidence Part 1: Best Available Research Evidence. A Guide to the Continuum of Evidence of Effectiveness*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2011.
10. US Department of Commerce. Bureau of Economic Analysis National Data website. Table 2.5.4. Price Indexes for Personal Consumption Expenditures by Function. https://bea.gov/iTable/index_nipa.cfm. Accessed June 11, 2017.

Domain 3:

Effective Strategies in Health Care System Interventions



Health care system interventions have the potential to improve the delivery and quality of care in clinical settings. Effective strategies in this domain can lead to earlier detection, improved disease management, and even prevention of the onset of CVD.



Promoting Team-Based Care to Improve Hypertension Control



Self-Management Support and Education



Pharmacy: Collaborative Practice Agreements to Enable Collaborative Drug Therapy Management



Reducing Out-of-Pocket Costs for Medications



Self-Measured Blood Pressure Monitoring with Clinical Support



Implementing Clinical Decision Support Systems



Promoting Team-Based Care to Improve High Blood Pressure Control

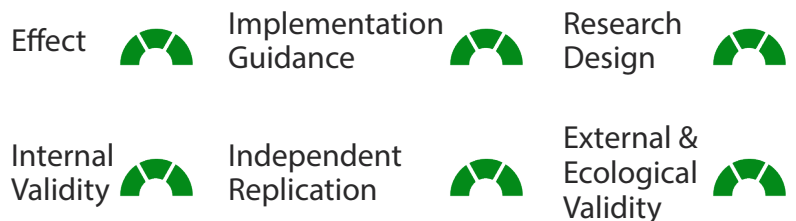
Team-based care is a strategy that can be implemented at the health system level to enhance patient care by having two or more health care providers working collaboratively with each patient. Within the context of cardiovascular disease (CVD) prevention, it often involves a multidisciplinary team working in collaboration to educate patients, identify risk factors for disease, prescribe and modify treatments, and maintain an ongoing dialog with patients about their health and care.^{1,2} These teams may include doctors, nurses, pharmacists, community paramedics, primary care providers, community health workers, and others (e.g., dietitians).




Summary

Team-based care, involving collaboration between doctors, nurses, pharmacists, paramedics, and others, is a cost-effective strategy for increasing medication adherence and lowering blood pressure among diverse populations and in various settings.

Stories From the Field:
WinMed Health Services
(Cincinnati, Ohio).

Evidence of Effectiveness



Legend: Well supported/Supported  Promising/Emerging  Unsupported/Harmful 

Evidence of Impact



Legend: Supported  Moderate  Insufficient 



Evidence of Effectiveness

The evidence base for implementing team-based care in health care systems and practices is very strong. Solid evidence exists that this strategy achieves desired outcomes, with studies demonstrating internal and external validity. This strategy has also been independently replicated, which shows reliability of impact. Several randomized controlled trials, which are often considered the gold standard in research, have been conducted and show positive results from using multidisciplinary teams as a way to improve hypertension control. Various organizations, such as the American Medical Association and the Agency for Healthcare Research and Quality (AHRQ), have developed guidelines to help health care systems and practices implement this strategy as part of their policies and protocols.

Evidence of Impact

Health Impact

A systematic review by the Community Preventive Services Task Force concluded that team-based care can lead to significantly improved hypertension control, lowered systolic and diastolic blood pressure levels (overall median reductions were 5.4 mmHg and 1.8 mmHg, respectively), and improved patient adherence to hypertensive medication.³

The evidence base for implementing team-based care in health care systems and practices is very strong.

Health Disparity Impact

Team-based care has been found to be effective when used among diverse patient populations, including those with members of different racial and ethnic groups (e.g., whites, African Americans) and among patients with multiple health conditions.

Evidence also exists that this strategy is effective among low-income populations. Additional research is needed to examine effectiveness among populations that are primarily Hispanic and in communities with other minority populations.³

Economic Impact

Team-based care has proven to be cost-effective. The median total cost for providing team-based care for hypertension control was found to be \$355 per person per year. The median cost per quality-adjusted life year (QALY) gained over 20 years was either \$10,511 or \$15,137, depending on the QALY conversion method used.⁴ Both estimates were well below the commonly used and conservative cost-effectiveness threshold of \$50,000 per QALY.

Researchers modeled the health and economic impact of nationwide adoption of team-based care for hypertension over 10 years and estimated a net cost savings to Medicare of \$5.8 billion (2012 US dollars) over this period.⁵ This model also estimates an overall national savings of \$25.3 billion in averted disease costs, which offsets an estimated \$22.9 billion cost of using this intervention to the health care system. Costs for patient time over this period are estimated at \$15.8 billion, but are largely offset by an estimated \$11 billion in productivity gains.



Stories from the Field

Team-Based Care



Team-Based Care at WinMed Health Services

WinMed Health Services, an FQHC in Cincinnati, Ohio, is a 2014 Million Hearts® Hypertension Control Champion that successfully incorporated team-based care to help achieve hypertension control among its patients. To ensure a continuum of complete patient care, WinMed's care teams include physicians, pharmacists, and behavioral and dental professionals. WinMed focuses on increasing health care providers' expertise and skills, providing opportunities for patient education, ensuring that patient care is team-based, and using registry-based information systems. The WinMed care teams use electronic health records to increase proper communication between patients and the different providers. By improving community ties and patient education, encouraging greater patient engagement, and adding pharmacists and patient assistants to the health care team, WinMed achieved a 7% increase in hypertension control among its patients from 2013 to 2014.

For more information:

Website: www.winmedinc.org/index.htm



Four Considerations for Implementation

1 Settings

Team-based care has been successfully implemented in multiple settings, including Federally Qualified Health Centers (FQHCs), patient-centered medical homes, and managed health care systems, in various locations throughout the United States.

2 Policy and Law-Related Considerations

Scope-of-practice laws and organizational policies that allow nurses, physician assistants, pharmacists, and other health care providers to practice to the full extent of their licensure and training can facilitate team-based care.

3 Implementation Guidance

The American Medical Association and AHRQ have developed modules for implementing team-based care:

- [American Medical Association's STEPSforward: Implementing Team-Based Care](#).⁶
- [Agency for Healthcare Research and Quality's Practice Facilitation Handbook](#).⁷

4 Resources

Many federal initiatives and medical institutions support team-based care approaches. Examples include the following:

- [Centers for Disease Control and Prevention's 6|18 Initiative](#).⁸
- [National High Blood Pressure Educational Program, supported by the National Heart, Lung, and Blood Institute](#).²
- [American Heart Association](#).⁹
- [National Academy of Medicine](#).¹⁰



References

1. Community Preventive Services Task Force. Cardiovascular Disease: Team-Based Care to Improve Blood Pressure Control. The Guide to Community Preventive Services website. <https://www.thecommunityguide.org/findings/cardiovascular-disease-team-based-care-improve-blood-pressure-control>. Accessed October 18, 2016.
2. Chobanian AV, Bakris GL, Black HR, et al. Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Hypertension*. 2003;42(6):1206–1252.
3. Proia KK, Thota AB, Njie GJ, et al. Team-based care and improved blood pressure control: a Community Guide systematic review. *Am J Prev Med*. 2014;47(1):86–99.
4. Jacob V, Chattopadhyay SK, Thota AB, et al. Economics of team-based care in controlling blood pressure: a Community Guide systematic review. *Am J Prev Med*. 2015;49(5):772–783.
5. Dehmer SP, Baker-Goering MM, Maciosek MV, et al. Modeled health and economic impact of team-based care for hypertension. *Am J Prev Med*. 2016;50(suppl 1):S34–S44.
6. Sinsky C, Rajcevic E. Implementing Team-Based Care website. <https://www.stepsforward.org/modules/team-based-care>. Accessed February 1, 2017.
7. Agency for Healthcare Research and Quality. Module 19. Implementing Care Teams. Practice Facilitation Handbook website. <https://www.ahrq.gov/professionals/prevention-chronic-care/improve/system/pfhandbook/mod19.html>. Accessed February 1, 2017.
8. Centers for Disease Control and Prevention. The 6|18 Initiative: Accelerating Evidence into Action website. <https://www.cdc.gov/sixteen/>. Accessed February 1, 2017.
9. Heidenreich PA, Trogdon JG, Khavjou OA, et al. Forecasting the future of cardiovascular disease in the United States: a policy statement from the American Heart Association. *Circulation*. 2011;123(8):933–944.
10. Institute of Medicine. *A Population-Based Policy and Systems Change Approach to Prevent and Control Hypertension*. Washington, DC: The National Academies Press; 2010.



Pharmacy: Collaborative Practice Agreements to Enable Collaborative Drug Therapy Management

Collaborative drug therapy management (CDTM), also known as coordinated drug therapy management, involves developing a collaborative practice agreement (CPA) between one or more health care providers and pharmacists. A CPA allows qualified pharmacists working within the context of a defined protocol to assume professional responsibility for performing patient assessments, counseling, and referrals; ordering laboratory tests; administering drugs; and selecting, initiating, monitoring, continuing, and adjusting drug regimens.¹ The use of CDTM through a CPA is a strategy that can be considered to straddle both Domains 3 (health care system interventions) and 4 (community-clinical links).

Summary

CDTM enabled by a CPA is a formal partnership between qualified pharmacists and prescribers to expand a pharmacist's scope of practice. CDTM is a cost-effective strategy for lowering blood pressure, blood sugar, and LDL cholesterol levels; improving treatment quality; and increasing medication adherence.

Stories From the Field:

El Rio Community Center (Pima County, Arizona).

Evidence of Effectiveness

Effect



Implementation Guidance



Research Design



Internal Validity






Independent Replication



External & Ecological Validity



Legend: Well supported/Supported  Promising/Emerging  Unsupported/Harmful 

Evidence of Impact

Health Impact



Health Disparity Impact



Economic Impact



Legend: Supported  Moderate  Insufficient 



Evidence of Effectiveness

Strong evidence exists that CDTM enabled by a CPA is effective. Solid evidence exists that this strategy achieves desired outcomes, with studies demonstrating internal and external validity. This strategy has also been independently replicated, and systematic reviews assessing the use of CDTM have confirmed reliability of impact. Implementation guidance on CPAs to enable CDTM was found to be lacking in comprehensiveness.

Evidence of Impact

Health Impact

CDTM, enabled by CPAs between pharmacists and other health care providers, has been shown effective in improving clinical and behavioral health indicators, including lowering blood pressure, HbA1c, and LDL cholesterol levels; improving treatment quality through pharmacist compliance with clinical guidelines; and increasing patient knowledge and adherence to medication regimens.²



Health Disparity Impact

The goals of reaching populations at risk and reducing health disparities have been taken into account in the development and implementation of CPAs, particularly by pharmacy organizations (e.g., the American Pharmacists Association), state medical and pharmacy boards, and state pharmacy organizations. However, no studies have directly examined the impact of CPAs between pharmacists and providers serving low-income populations. Because pharmacists often work directly with the public in community settings, they are often considered the public's most accessible health care providers. CPAs can authorize pharmacists to make changes to a patient's medication or dosage, which can reduce the number of visits a patient has to make and lower costs, while also making it easier for patients to adhere to their medications.

Economic Impact

Research suggests that clinical pharmacy services like CDTM can be cost-saving to the health care system, primarily through avoided hospitalizations and emergency room (ER) visits.³ For example, in 2006, Missouri's Pharmacy-Assisted CDTM program resulted in a 12% decrease in any-cause hospitalizations, a 25% reduction in ER visits, and a decrease in drug-related problems among beneficiaries after 1 year. This program was also found to have a 2.5 to 1 ROI to the state, with an estimated savings of \$518.10 per patient per month.³

Strong evidence exists that CDTM enabled by a CPA is effective.

Stories from the Field

Collaborative Practice Agreements



CPAs at El Rio Community Center

El Rio Community Health Center serves over 75,000 people in Pima County, Arizona. In 2011, 20% of El Rio's adult patients (8,954 of 44,952) had diagnosed hypertension, but only 67% of those diagnosed had the condition under control. Pharmacists at El Rio were encouraged to establish CPAs with the center's medical providers. These agreements enable pharmacists to work directly with patients to help them manage their hypertension and other chronic conditions, such as diabetes and hyperlipidemia. Within the scope of the CPA, pharmacists have the discretion to change patient medications. After CDTM was implemented, El Rio reported improved clinical outcomes (e.g., lower cholesterol and blood pressure levels), increased use of recommended screenings, and reduced ER visits. The El Rio case study highlights several important considerations for CDTM implementation. These considerations include instilling mission-driven values through training and orientation, accepting pharmacy student interns, and using broad strategies and networks to improve patient care and increase potential partnerships that may extend the use of CPAs.

For more information:
Phone: 520-670-3909
Website: www.elrio.org



Four Considerations for Implementation

1 Settings

Enabling CDTM through CPAs has been found to be effective in several clinical and community settings, including federally qualified health centers (FQHC), patient-centered medical homes, managed care health systems, community pharmacies, hospital pharmacies, and primary care clinics.

2 Policy and Law-Related Considerations

CPAs are typically authorized through state scope-of-practice laws that may or may not allow for their use within pharmacist scope-of-practice laws. Challenges associated with billing for services exist, even at the federal level.^{12,13} When a CPA is developed, the pharmacist and the prescriber work together to develop the terms of the CPA. They may use recommendations and model language available from various organizations.^{5,6,14}

3 Implementation Guidance

CDC has recently developed a CPA tool kit that provides implementation guidance:

- [Advancing Team-Based Care Through Collaborative Practice Agreements: A Resource and Implementation Guide for Adding Pharmacists to the Care Team.](#)⁴

Guidance from the state level comes from the following sources:

- [National Association of State Pharmacy Associations.](#)⁵
- [American Pharmacy Association.](#)⁶

4 Resources

Several guides and examples are available to educate and guide health care providers, decision makers, insurers, and pharmacists about how pharmacists and other health care providers can better serve patients through CPAs and CDTM. Examples include the following:

- [Collaborative Practice Agreements and Pharmacists' Patient Care Services: A Resource for Pharmacists.](#)⁷
- [A Resource for Nurses, Physician Assistants, and Other Providers.](#)⁸
- [A Resource for Government and Private Payers.](#)⁹
- [A Program Guide for Public Health: Partnering with Pharmacists.](#)¹⁰
- [Agency for Healthcare Research and Quality, Pharmacy Quality Alliance.](#)¹¹



References

1. Hammond RW, Schwartz AH, Campbell MJ, et al. Collaborative drug therapy management by pharmacists—2003. *Pharmacotherapy*. 2003;23:1210–1225.
2. Chisholm-Burns MA, Kim Lee J, Spivey CA, et al. US pharmacists' effect as team members on patient care: systematic review and meta-analyses. *Med Care*. 2010;48(10):923–933.
3. US Department of Health and Human Services. *Special Report to the Senate Appropriations Committee on Advancing Clinical Pharmacy Services in Programs Funded by the Health Resources and Services Administration and Its Safety-Net Partners*. Washington, DC: US Department of Health and Human Services; 2008.
4. Centers for Disease Control and Prevention. *Advancing Team-Based Care Through Collaborative Practice Agreements: A Resource and Implementation Guide for Adding Pharmacists to the Care Team*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2017.
5. Weaver K. *Pharmacist Collaborative Agreements: Key Elements for Legislative and Regulatory Authority*. Richmond, VA: The National Alliance of State Pharmacy Associations; 2015.
6. American Pharmacists Association. Collaborative Practice Agreements: NASPA Workgroup Releases Recommendations website. <https://www.pharmacist.com/collaborative-practice-agreements-naspa-workgroup-releases-recommendations>. Accessed February 14, 2017.
7. Centers for Disease Control and Prevention. *Collaborative Practice Agreements and Pharmacists' Patient Care Services: A Resource for Pharmacists*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.
8. Centers for Disease Control and Prevention. *Collaborative Practice Agreements and Pharmacists' Patient Care Services: A Resource for Doctors, Nurses, Physician Assistants, and Other Providers*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.
9. Centers for Disease Control and Prevention. *Collaborative Practice Agreements and Pharmacists' Patient Care Services: A Resource for Government and Private Payers*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.
10. Centers for Disease Control and Prevention. *A Program Guide for Public Health: Partnering with Pharmacists in the Prevention and Control of Chronic Diseases*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2012.
11. Agency for Healthcare Research and Quality. *New Models of Primary Care Workforce and Financing Case Example #3: Fairview Health Services*. Rockville, MD: Agency for Healthcare Research and Quality; 2016.
12. McBane S, Dopp A, Abe A, et al. ACCP white paper: collaborative drug therapy management and comprehensive medication management - 2015. *Pharmacotherapy*. 2015;35(4):e39–e50.
13. Centers for Disease Control and Prevention. *Select Features of State Pharmacist Collaborative Laws*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.
14. National Association of Boards of Pharmacy. Model State Pharmacy Act/ Rules website. <https://nabp.pharmacy/publications-reports/resource-documents/model-pharmacy-act-rules/>. Accessed May 18, 2017.



Self-Measured Blood Pressure Monitoring With Clinical Support

Self-measured blood pressure monitoring (SMBP) involves a patient's regular use of personal blood pressure monitoring devices to assess and record blood pressure across different points in time outside of a clinical or community or public setting, typically at home.^{1,2} When combined with clinical support (e.g., one-on-one counseling, web-based or telephonic support tools, education), SMBP can enhance the quality and accessibility of care for people with high blood pressure and improve blood pressure control.³

Summary

SMBP with clinical support involves training patients to regularly monitor and record their own blood pressure at home with a personal device and rely on clinical support as needed. SMBP is a cost-effective strategy for lowering blood pressure and increasing medication adherence.

Stories From the Field:

Millgrove Medical Center
(Norristown, Pennsylvania).

Evidence of Effectiveness

Effect



Implementation
Guidance



Research
Design



Internal
Validity



Independent
Replication



External &
Ecological
Validity



Legend: Well supported/
Supported Promising/
Emerging Unsupported/
Harmful

Evidence of Impact

Health
Impact



Health
Disparity
Impact



Economic
Impact



Legend: Supported Moderate Insufficient



Evidence of Effectiveness

The evidence base for implementing SMBP in health care systems and practices is very strong. Studies demonstrate internal and external validity, and there has been independent replication with positive results. Several studies show the positive effect of SMBP in improving blood pressure control. Comprehensive implementation guidance is available to facilitate the adoption of this strategy by health care systems and practices.

Evidence of Impact

Health Impact

SMBP has proven useful in reducing the risk of death and disability associated with hypertension.^{4,5} The research literature has shown that, when combined with additional clinical support, SMBP is effective in reducing hypertension, improving patient knowledge, improving the health system process, and enhancing medication adherence.² SMBP has also been associated with patient empowerment, autonomy, self-efficacy, and lifestyle modification.



Health Disparity Impact

Evidence is insufficient to show that SMBP affects health disparities. Some of this lack of evidence is related to minorities being underrepresented in comparative studies.² In current studies, some findings show that SMBP failed to improve blood pressure control for a largely minority, urban population of Hispanics and people without insurance, a population which is largely understudied.⁶ A statistically significant difference in systolic blood pressure was found for white participants who used SMBP, but not for African Americans or Hispanics. Studies note the potential negative effect of barriers to SMBP for low-income and minority groups. For example, while validated blood pressure monitors for home use are generally considered affordable, the lack of reimbursement for these devices and additional out-of-pocket costs can be barriers for low-income populations.

SMBP has proven useful in reducing the risk of death and disability with hypertension.

Economic Impact

Economic evidence from a review by the Community Preventive Services Task Force indicates that SMBP monitoring strategies are cost-effective when combined with additional clinical support or within a team-based care model.⁷ The median cost per quality-adjusted life year (QALY) gained over a 20-year period for SMBP with additional support was \$2,832 or \$4,046, depending on the QALY conversion method used.⁷ The median cost per QALY gained for SMBP as part of team-based care was \$7,585 or \$10,923.⁷ SMBP has been found to be cost-beneficial for insurers, with an estimated net savings associated with the use of home blood pressure monitors ranging from \$33 to \$168 per member in the first year and from \$420 to \$1,380 per member over 10 years.⁸ The return on investment (ROI) for the insurer ranges from \$0.85 to \$3.75 per \$1 invested in the first year and from \$7.50 to \$19.34 per \$1 invested over 10 years. Because of the clear financial and health benefits of SMBP, experts from the American Heart Association, American Society of Hypertension, and Preventive Cardiovascular Nurses Association recommend that payers cover the costs of home blood pressure monitors, patient training in SMBP techniques, and clinical support.³

Stories from the Field

Self-Measured Blood Pressure



SMBP at Millgrove Medical Center

The family practice of Dr. Nilesh V. Patel at Millgrove Medical Center in Norristown, Pennsylvania, serves 5,300 adult patients in eastern Pennsylvania and is a 2013 Million Hearts Hypertension Control Champion. The practice achieved successful outcomes using SMBP by training patients to monitor and record their blood pressure with a blood pressure cuff at home and then transferring these measurements to the patients' electronic health record (EHR). By using SMBP and EHRs and including pharmacists in a team-based care approach, the practice increased the blood pressure control rate for its patients from 83.4% to 94.9% in 1 year. This improvement translates to an additional 49 patients who are reaching their target blood pressure and significantly reducing their risk of cardiovascular disease.

For more information:

Website: www.millgrovemedical.com

Phone: 610-666-1400



Four Considerations for Implementation

1 Settings

SMBP efforts have been implemented in many clinical and community settings, including FQHCs, general practices, YMCAs, and Veterans Affairs medical centers.

2 Policy and Law-Related Considerations

Insurance coverage for SMBP is not universal, but varies by state and individual insurance plans. Coverage can vary by SMBP components (e.g., blood pressure measurement devices, clinical support, training). Traditional fee-for-service models often reimburse only for office-based visits and services. More information on coverage under Medicare and Medicaid can be found online and through Million Hearts resources.³ When not covered by insurance, health care flexible spending accounts have been recommended to cover the costs of home blood pressure monitors.

3 Implementation Guidance

Through the Million Hearts® initiative, CDC has created a series of translation guides on SMBP for public health practitioners and clinicians. The Million Hearts website also has an SMBP webpage, which has resources, evidence, tools, and information about effective SMBP practices. See these links for more information on implementation:

- [Self-Measured Blood Pressure Monitoring: Action Steps for Clinicians.](#)³
- [Self-Measured Blood Pressure Monitoring: Action Steps for Public Health Practitioners.](#)⁹
- [Self-Measured Blood Pressure Monitoring by Million Hearts.](#)¹⁰

4 Resources

Several federal agencies and initiatives provide resources related to the use of SMBP, including:

- [Community Preventive Services Task Force.](#)¹¹
- [US Preventive Services Task Force.](#)¹²
- [Centers for Disease Control and Prevention's 6|18 Initiative.](#)¹³



References

1. Shimbo D, Abdalla M, Falzon L, Townsend RR, Muntner P. Role of ambulatory and home blood pressure monitoring in clinical practice: a narrative review of blood pressure monitoring. *Ann Intern Med.* 2015;163(9):691–700.
2. Uhlig K, Patel K, Ip S, Kitsios GD, Balk EM. Self-measured blood pressure monitoring in the management of hypertension: a systematic review and meta-analysis. *Ann Intern Med.* 2013;159(3):185–194.
3. Centers for Disease Control and Prevention. *Self-Measured Blood Pressure Monitoring: Actions Steps for Clinicians.* Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2014.
4. Fletcher BR, Hinton L, Hartmann-Boyce J, Roberts NW, Bobrovitz N, McManus RJ. Self-monitoring blood pressure in hypertension, patient and provider perspectives: a systematic review and thematic synthesis. *Patient Educ Couns.* 2016;99(2):210–219.
5. Stergiou GS, Bliziotis IA. Home blood pressure monitoring in the diagnosis and treatment of hypertension: a systematic review. *Am J Hypertens.* 2010;24(2):123–134.
6. Yi SS, Tabaei BP, Angell SY, et al. Self-blood pressure monitoring in an urban, ethnically diverse population: a randomized clinical trial utilizing the electronic health record. *Circ Cardiovasc Qual Outcomes.* 2015;8(2):138–145.
7. Verugheze J, Chattopadhyay SK, Proia KK, et al. Economics of self-measured blood pressure monitoring: a community guide systematic review. *Am J Prev Med.* 2017;53(3):e105–e113.
8. Arrieta A, Woods J, Qiao N, Jay S. Cost-benefit analysis of home blood pressure monitoring in hypertension diagnosis and treatment: an insurer perspective. *Hypertension.* 2014;64:891–896.
9. Centers for Disease Control and Prevention. *Self-Measured Blood Pressure Monitoring: Actions Steps for Public Health Practitioners.* Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.
10. Million Hearts. Self-Measured Blood Pressure Monitoring website. <https://millionhearts.hhs.gov/tools-protocols/smbp.html>. Accessed April 17, 2017.
11. Community Preventive Services Task Force. The Guide to Community Preventive Services website. Cardiovascular Disease. https://www.thecommunityguide.org/topic/cardiovascular-disease?field_recommendation_tid=7476&items_per_page=All. Accessed February 14, 2017.
12. US Preventive Services Task Force. Final Recommendation Statement: High Blood Pressure in Adults: Screening website. <https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/high-blood-pressure-in-adults-screening>. Accessed February 14, 2017.
13. Centers for Disease Control and Prevention. The 6|18 Initiative: Accelerating Evidence into Action website. <https://www.cdc.gov/sixteen/>. Accessed February 1, 2017.



Self-Management Support and Education

Self-management involves focusing on an individual's role in managing chronic disease. This term is often associated with self-care and includes an array of activities needed to effectively manage one or more chronic conditions.¹ Self-management support and education is defined as assistance provided by clinicians and public health practitioners to enhance an individual's self-efficacy in managing one or more chronic conditions. This assistance can include activities such as patient education, support for lifestyle modifications, and support to help individuals develop the skills needed for effective chronic disease management.^{1,2}

Summary

Self-management support and education provided to patients by clinicians and public health practitioners is an effective strategy for improving patient knowledge and self-efficacy, lowering blood pressure, and increasing medication adherence.

Stories From the Field:
ThedaCare (Wisconsin).

Evidence of Effectiveness

Effect



Implementation Guidance



Research Design



Internal Validity



Independent Replication



External & Ecological Validity



Legend: Well supported/Supported Promising/Emerging Unsupported/Harmful

Evidence of Impact

Health Impact



Health Disparity Impact



Economic Impact



Legend: Supported Moderate Insufficient



Evidence of Effectiveness

The evidence base for implementing self-management support and education for people with chronic disease, including those with hypertension, in health care systems and practices is very strong. Studies demonstrate internal and external validity, and there has been independent replication with positive results. Several studies have been conducted and show the positive effect of self-management support and education in improving blood pressure control. However, limited implementation guidance is available to help health care systems and practices adopt this strategy.

Evidence of Impact

Health Impact

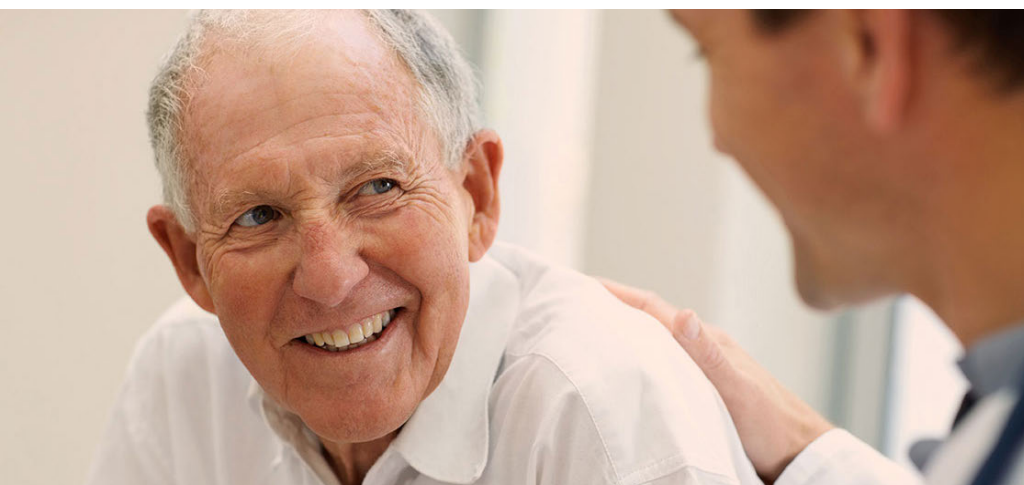
Self-management support and education has been linked specifically to positive cardiovascular outcomes, including lowered blood pressure, increased hypertension-related knowledge, and enhanced competence in hypertension self-management behaviors.¹⁻⁴ Research has also shown that self-management support and education can improve medication adherence, self-efficacy, self-rated health, cognitive symptom management, frequency of aerobic exercise, and depression.⁵

Health Disparity Impact

Self-management programs have been effective among both white and African American participants, but studies note the need to further test programs among other racial and ethnic populations. Certain components of self-management support and education may be more important in rural and low-income settings, where health care resources may be limited, but this issue has not been looked at in-depth and deserves further exploration.⁶

Economic Impact

The costs of chronic disease self-management programs vary depending on the strategy and program components used. Hypertension self-management education programs that use strategies beyond SMBP can be cost-effective.⁷ Chronic disease self-management programs can potentially be cost-saving. For example, one self-management education program was estimated to save health systems \$394 per participant per year, and it has been estimated that health systems could save \$3.9 billion nationally if 5% of adults with one or more chronic conditions were reached.⁸ More research that uses actual cost data rather than modeled estimates is needed to confirm these findings.



Self-management support and education has been linked specifically to positive cardiovascular outcomes.

Stories from the Field

Self-Management Education



Self-Management Education at ThedaCare

ThedaCare health care system serves 100,357 adult patients in northeast Wisconsin. ThedaCare is a 2013 Million Hearts® Hypertension Control Champion that has successfully implemented a self-management program to help adults with hypertension learn self-management skills. Patients in the ThedaCare Physicians program are given educational materials on nutrition, exercise, hypertension medication, health problems associated with hypertension, and smoking cessation. When they complete the program, patients receive a free home blood pressure monitor. After implementing the program, ThedaCare reported steady improvement among patients with uncomplicated hypertension. From 2012 to 2013, the blood pressure control rate among ThedaCare patients increased by 1.4% (81.6% to 83.0%), which equates to 23,136 of ThedaCare's 27,879 patients with high blood pressure having this condition under control. ThedaCare's success is attributed to having strong leadership support and a provider champion for the program.

For more information:

Website: www.thedacare.org

Phone: 920-831-180



Four Considerations for Implementation

1 Settings

Self-management support and education has been implemented in several community and clinical settings, including YMCAs, federally qualified health centers (FQHCs), and managed care health systems.

2 Policy and Law-Related Considerations

In 2016, the Centers for Medicare & Medicaid Services (CMS) finalized regulations for the Cardiac Rehabilitation Incentive Payment Model, which reimburses for cardiac rehabilitation services, including self-management support and education, in selected geographic areas. This regulation covers beneficiaries hospitalized for a heart attack or bypass surgery. More information about this regulation can be found on CMS's [Cardiac Rehabilitation Incentive Payment Model website](#).

3 Implementation Guidance

Health departments can link patients to self-management programs in their communities. One tool developed to help patients find self-management educational programs in their communities is a CDC resource called [Learn More. Feel Better](#).⁹

4 Resources

Self-management support and education for chronic disease is widely supported by federal and nonfederal initiatives, including [CDC's Million Hearts Initiative](#).¹⁰



References

1. Galdas P, Fell J, Bower P, et al. The effectiveness of self-management support interventions for men with long-term conditions: a systematic review and meta-analysis. *BMJ Open*. 2015;5(3):e006620.
2. Dye CJ, Williams JE, Evatt JH. Activating patients for sustained chronic disease self-management. *J Prim Care Community Health*. 2016;7(2):107–112.
3. Taylor SJC, Pinnock H, Epiphaniou E, et al. A rapid synthesis of the evidence on interventions supporting self-management for people with long-term conditions: PRISMS – Practical systematic Review of Self-Management Support for long-term conditions. *Health Serv Deliv Res*. 2014;2(53).
4. Thomas VG, Gaston MH, Porter GK, Anderson A. Prime Time Sister Circles®II: evaluating a culturally relevant intervention to decrease psychological and physical risk factors for chronic disease in mid-life African American women. *J Natl Med Assoc*. 2016;108(1):6–18.
5. Franek J. Self-management support interventions for persons with chronic disease: an evidence-based analysis. *Ont Health Technol Assess Ser*. 2013;13(9):1–60.
6. Whittle J, Schapira MM, Fletcher KE, et al. A randomized trial of peer-delivered self-management support for hypertension. *Am J Hypertens*. 2014;27(11):1416–1423.
7. Trogon JG, Larsen B, Larsen D, Salas W, Snell M. Cost-effectiveness evaluation of a collaborative patient education hypertension intervention in Utah. *J Clin Hypertens (Greenwich)*. 2012;14(11):760–766.
8. Ahn S, Basu R, Smith ML, et al. The impact of chronic disease self-management programs: healthcare savings through a community-based intervention. *BMC Public Health*. 2013;13(1):1–6.
9. Centers for Disease Control and Prevention. Self-Management Education: Learn More. Feel Better website. <https://www.cdc.gov/learnmorefeelbetter/>. Accessed February 14, 2017.
10. Million Hearts. Tools and Protocols website. <https://millionhearts.hhs.gov/index.html>. Accessed February 1, 2017.
11. Centers for Medicare & Medicaid Services. Cardiac Rehabilitation (CR) Incentive Payment Model website. <https://innovation.cms.gov/initiatives/cardiac-rehabilitation/>. Accessed July 3, 2017.



Reducing Out-of-Pocket Costs for Medications

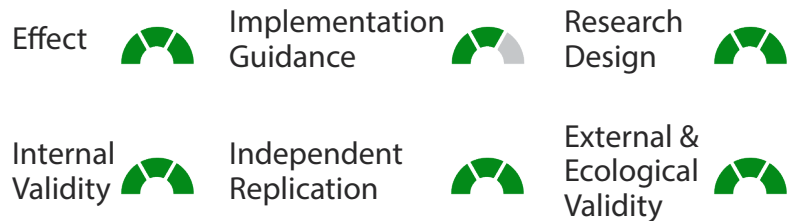
Reducing out-of-pocket costs (ROPC) for patients with hypertension and hyperlipidemia involves program and policy changes that make medications for cardiovascular disease (CVD) prevention more affordable. Costs for medications can be reduced by providing new or expanded coverage and lowering or eliminating out-of-pocket payments by patients (e.g., copayments, coinsurances, deductibles).¹




Summary

Reducing costs on medications for patients with hypertension and hyperlipidemia is an effective strategy for increasing medication adherence and lowering blood pressure and cholesterol levels among diverse populations and in various settings.

Stories From the Field: Kaiser Permanente Northern California.


Evidence of Effectiveness

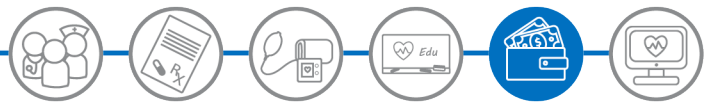


Legend: Well supported/Supported  Promising/Emerging  Unsupported/Harmful 

Evidence of Impact



Legend: Supported  Moderate  Insufficient 



Evidence of Effectiveness

The evidence base supporting the implementation of ROPC strategies to promote medication adherence is very strong. Studies examining ROPC for medications have demonstrated strong internal and external validity. A review by the Community Preventive Services Task Force concluded that ROPC for medications is effective for increasing medication adherence and results in improved health outcomes. Evaluations of ROPC strategies have been replicated with positive results. Unfortunately, no comprehensive guidance for implementing ROPC strategies is available.

Evidence of Impact

Health Impact

Evidence shows that ROPC for medications for patients with hypertension and hyperlipidemia is effective in improving medication adherence, which results in lower blood pressure and cholesterol levels. The Community Preventive Services Task Force found that ROPC for patients taking blood pressure and cholesterol medications increased medication adherence by 3 percentage points and increased the proportion of patients achieving 80% adherence by 5.1 percentage points, which significantly improved blood pressure and cholesterol outcomes.^{1,2}

Health Disparity Impact

Evidence shows that ROPC for medications is an effective strategy for men and women and for patients from racial and ethnic minority groups. ROPC is especially beneficial for low-income patients, who face the greatest financial barriers to taking medications as prescribed.²

ROPC for medications is an effective strategy for men and women and for patients from racial and ethnic minority groups.

Economic Impact

The evidence base for the economic benefits of ROPC for medications is limited, and findings are inconsistent. The Community Preventive Services Task Force found that the median intervention cost for ROPC for medications was \$174 per person per year. The Task Force's review found that ROPC could reduce health care costs, with a median change of -\$128 per person per year. Health care savings could potentially offset intervention costs, but evidence on net benefits was limited and mixed. Therefore, no overall conclusion could be reached. More research on cost-effectiveness is needed.²



Stories from the Field

Reducing Medication Costs



ROPC at Kaiser Permanente Northern California

Kaiser Permanente Northern California (KPNC) is a 2013 Million Hearts® Hypertension Control Champion because of its hypertension program. The program seeks to improve hypertension control through five key strategies: a comprehensive hypertension registry, performance metrics, evidence-based guidelines for treatment, medical assistant visits for blood pressure measurement, and single-pill combination pharmacotherapy. Two of the five strategies reduced out-of-pocket costs for patients. One eliminated copayments for patients who visited a medical assistant for blood pressure monitoring, while the other introduced a less-expensive, single-pill combination therapy that combined two medications into one. KPNC reported significant improvements since it began using this multicomponent hypertension program. From 2001 to 2013, hypertension control among KPNC's patients increased from 44% to 90%, which translated to more than 200,000 additional patients who had their blood pressure under control. Although the success of this program could not be attributed to any one component alone, ROPC for medications likely played an important role, as prescription rates for hypertension drugs increased significantly after the introduction of the single-pill combination therapy.

For more information:

Marc G. Jaffe, MD

Department of Endocrinology, Kaiser Permanente South San Francisco Medical Center

E-mail: marc.jaffe@kp.org



Four Considerations for Implementation

1 Settings

Strategies to reduce ROPC for medications can be implemented by health care providers and plans, government agencies, and employers who offer insurance plans to their employees.¹

2 Policy and Law-Related Considerations

Policies or programs to reduce or eliminate out-of-pocket costs for medications can be coordinated and implemented through health care systems, partnerships, and health care providers or insurance plans. One ROPC policy approach is to reduce or eliminate copayments for generic medications. Providers may need to discuss appropriate generic medications with their patients.¹ Many states have statutory or regulatory requirements that (1) require Medicaid providers to use generics first and (2) require or authorize pharmacists to switch Medicaid patients to an equivalent generic drug if a brand name drug is prescribed.⁵

3 Implementation Guidance

Direct implementation guidance for ROPC was not readily available at the time of this publication. Collaboration between public insurance plans, such as Medicare and Medicaid, and private insurance plans should be considered to promote use of these strategies.

4 Resources

ROPC for medications is a strategy that is supported by several federal initiatives, including:

- [CDC's 6|18 Initiative](#).³
- [CDC's Medication Adherence Action Guide](#).⁴



References

1. Fielding JE, Rimer BK, Johnson RL, et al. Recommendation to reduce patients' blood pressure and cholesterol medication costs. *Prev Chron Dis*. 2015;12:150253. doi: <http://dx.doi.org/10.5888/pcd12.150253>.
2. Nije GJ, Finnie RKC, Acharya SD, et al. Reducing medication costs to prevent cardiovascular disease: a Community Guide systematic review. *Prev Chron Dis*. 2015;12:150242. doi: <http://dx.doi.org/10.5888/pcd12.150242>.
3. Centers for Disease Control and Prevention. The 6|18 Initiative: Accelerating Evidence into Action. Evidence Summary: Control High Blood Pressure website. <https://www.cdc.gov/sixteen/bloodpressure/index.htm>. Accessed February 1, 2017.
4. Million Hearts. Medication Adherence website. <http://millionhearts.hhs.gov/tools-protocols/medication-adherence.html>. Accessed February 1, 2017.
5. Centers for Disease Control and Prevention. *State Law Fact Sheet. Prescription Drug Cost-Sharing and Antihypertensive Drug Access among State Medicaid Fee for Service Plans*, 2012. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.



Implementing Clinical Decision Support Systems

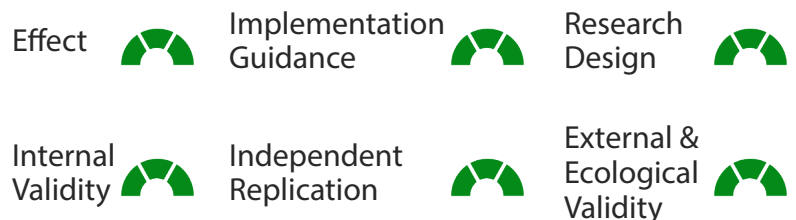
Clinical decision support systems (CDSS) are computer-based programs that analyze data within EHRs to provide prompts and reminders to assist health care providers in implementing evidence-based clinical guidelines at the point of care. Applied to cardiovascular (CVD) prevention, CDSS can be used to facilitate care in various ways—for example, by reminding providers to screen for CVD risk factors, flagging cases of hypertension or hyperlipidemia, providing information on treatment protocols, prompting questions on medication adherence, and providing tailored recommendations for health behavior changes.

Summary

CDSS involves the use of computer-generated reminders and prompts to help health care providers make clinical decisions. It is an effective strategy for increasing the quality of care in screening, testing, and treating patients with high blood pressure and high cholesterol. Evidence that it directly affects health outcomes is lacking.

Stories From the Field: South Omaha Medical Associates, Nebraska Department of Health and Human Services, Douglas County Health Department, and Wide River Health Information Technology.

Evidence of Effectiveness



Legend: Well supported/Supported Promising/Emerging Unsupported/Harmful

Evidence of Impact



Legend: Supported Moderate Insufficient



Evidence of Effectiveness

The evidence base demonstrating the effectiveness of CDSS is very strong. Research studies that examined CDSS had strong internal and external validity, the Community Preventive Services Task Force concluded that CDSS is effective, and CDSS trials have been replicated with positive results. Implementation guidance on CDSS is available from several sources.

Evidence of Impact

Health Impact

A review by the Community Preventive Services Task Force found that CDSS leads to significant improvements in the following three quality of care practices for CVD prevention delivered by health care providers:^{1,2}

- Recommendations for screening (e.g., for blood pressure or cholesterol) and other preventive care (e.g., smoking cessation).
- Evidence-based clinical tests related to CVD.
- CVD-related treatments prescribed.

Evidence exists that CDSS can be tied to lower blood pressure and cholesterol levels, but the findings on this association are inconsistent.

Health Disparity Impact

The ability of CDSS to reduce health disparities is understudied, and several researchers have suggested that further work is needed to directly examine this issue. Some have noted that providers working with underserved communities typically lag behind in the uptake of electronic health records (EHRs) and CDSS, and evidence exists that CDSS leads to successful health outcomes when used in underserved communities.^{3,4} Thus, it is reasonable to conclude that CDSS has the potential to eliminate barriers and reduce disparities in hypertension-related care.

Economic Impact

Economic factors related to the implementation and maintenance of CDSS have not been well-documented. A review by the Community Preventive Services Task Force was inconclusive because of a lack of available data. The Task Force found that current studies are extremely heterogeneous in the range of CDSS functions and CVD risk factors studied and in the completeness or inclusion of major cost factors. Thus, the ability to determine an overall estimate of the cost or economic benefit of CDSS is limited. Of the studies available, health care costs appear to be more likely to decrease than increase after CDSS implementation, but the usefulness of this evidence is limited by incomplete and inconsistent data.⁵ More data on the complete costs of developing, implementing, and operating CDSS systems are needed to fully assess its cost-effectiveness or return on investment.



The evidence base demonstrating the effectiveness of CDSS is very strong.

Stories from the Field

Clinical Decision Support



CDSS at South Omaha Medical Associates

South Omaha Medical Associates (SOMA) is a family-owned, family-operated clinic that is centrally located in South Omaha, Nebraska. It has a higher percentage of low-income patients than clinics in surrounding areas. SOMA collaborated with the Nebraska Department of Health and Human Services, Douglas County Health Department, and Wide River Health Information Technology to assess its technology needs and make plans to implement CDSS. As a result of this assessment, the clinic increased its use of EHRs and implemented systems to better identify patients with undiagnosed hypertension, increase use and monitoring of clinical quality measures, and increase use of clinically supported self-measured blood pressure monitoring. These changes improved workflow at the clinic and led to a 25% increase in patient visits since the start of the collaboration. In addition, Blue Cross Blue Shield awarded SOMA its Blue Distinction Award for meeting overall quality measures for patient safety and outcomes.

For more information:

Chronic Disease Prevention and Control Program
Nebraska Department of Health and Human Services
301 Centennial Mall South
Lincoln, NE 68509
E-mail: CVHProgram@dhhs.ne.gov



Four Considerations for Implementation

1 Settings

Although CDSS has been implemented in a wide variety of health care settings, most published research has been within the context of primary outpatient care.

2 Policy and Law-Related Considerations

Legal considerations for CDSS begin with the vendors who interpret and translate guidelines into algorithms used by these systems. Vendors must fully disclose the sources used to build the knowledge base for their software and any limitations or weaknesses of the software. Providers must ensure that CDSS programming is updated regularly to account for changes in evidence and guidelines, and that EHRs associated with CDSS include complete and up-to-date information about patients' medical histories and allergies.^{1,8,13} Provider fatigue or avoidance of CDSS guidance has been raised as a barrier to successful outcomes, leading to suggestions that initial and repeat trainings be a mandatory part of CDSS implementation.

3 Implementation Guidance

Implementation guidance for CDSS is available from various sources. The following resources may be particularly useful:

- [Measure Up Pressure Down: Provider Toolkit to Improve Hypertension Control from the American Medical Group Foundation.](#)⁶
- [Clinical Decision Support \(CDS\) Implementation: How-To Guides for CDS Implementation from HealthIT.gov.](#)⁷
- Castillo RS, Kelemen A. Considerations for a successful clinical support system. CIN: Computers, Informatics, Nursing.⁸

4 Resources

CDSS is supported and promoted by many federal initiatives and agencies, including:

- [CDC's Million Hearts Initiative.](#)⁹
- [Office of the National Coordinator for Health Information Technology.](#)¹⁰
- [CMS's Merit-Based Incentive Payment System: Advancing Care Information.](#)¹¹
- [Agency for Healthcare Research and Quality.](#)¹²



References

1. Community Preventive Services Task Force. The Guide to Community Preventive Services website. Cardiovascular Disease: Clinical Decision-Support Systems (CDSS). <https://www.thecommunityguide.org/findings/cardiovascular-disease-clinical-decision-support-systems-cdss>. Accessed August 17, 2017.
2. Njie GJ, Proia KK, Thota AB, et al. Clinical decision support systems and prevention: a Community Guide cardiovascular disease systematic review. *Am J Prev Med*. 2015;49(5): 784–795.
3. NORC at the University of Chicago. Understanding the Impact of Health IT in Underserved Communities and Those with Health Disparities. <https://www.healthit.gov/sites/default/files/pdf/hit-underserved-communities-health-disparities.pdf>. Accessed February 9, 2017.
4. Mitchell J, Probst J, Brock-Martin A, Bennett K, Glover S, Hardin J. Association between clinical decision support system use and rural quality disparities in the treatment of pneumonia. *J Rural Health*. 2014;30(2):186–195.
5. Jacob V, Thota AB, Chattopadhyay SK, et al. Cost and economic benefit of clinical decision support systems for cardiovascular disease prevention: a Community Guide systematic review. *J Am Med Inform Assoc*. 2017;24(3): 669–676.
6. American Medical Group Foundation. *Measure Up Pressure Down: Provider Toolkit to Improve Hypertension Control*. Alexandria, VA: American Medical Group Foundation; 2013.
7. HealthIT.gov. Clinical Decision Support (CDS) website. CDS Implementation: How-To Guides for CDS Implementation. <https://www.healthit.gov/policy-researchers-implementers/cds-implementation>. Accessed February 9, 2017.
8. Castillo RS, Kelemen A. Considerations for a successful clinical decision support system. *CIN: Computers, Informatics, Nursing*. 2013;31(7): 319–326.
9. Centers for Disease Control and Prevention. *Hypertension Control Change Package for Clinicians*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2015.
10. HealthIT.gov. Policymaking, Regulation, & Strategy website. Clinical Decision Support (CDS). <https://www.healthit.gov/policy-researchers-implementers/clinical-decision-support-cds>. Accessed April 12, 2017.
11. Merit-Based Incentive Payment System: Advancing Care Information website. <https://qpp.cms.gov/mips/advancing-care-information>. Accessed September 26, 2017.
12. Agency for Healthcare Research and Quality. Health Information Technology website. Clinical Decision Support (CDS). <https://healthit.ahrq.gov/ahrq-funded-projects/clinical-decision-support-cds>. Accessed April 12, 2017.
13. Fox J, Thomson R. Clinical decision support systems: a discussion of quality, safety and legal liability issues. *Proc AMIA Symp*. 2002:265–269.

Domain 4:

Effective Strategies in Community Programs Linked to Clinical Services



Community programs linked to clinical services, also called community-clinical links,

connect community programs with health systems to improve chronic disease prevention, care, and management. Effective links can reduce barriers to care and increase patient adherence to clinician recommendations.



Integrating Community Health Workers on Clinical Care Teams and in the Community



Community Pharmacists and Medication Therapy Management



Integrating Community Health Workers on Clinical Care Teams and in the Community

A **community health worker (CHW)** is defined as a frontline public health worker who is a trusted member of a community or who has a thorough understanding of the community being served.¹ This relationship allows CHWs to serve as a link between health and social service programs and the community to promote access to services and improve the quality and cultural competence of service delivery. CHWs also help build individual and community capacity to improve health outcomes by increasing health knowledge and self-sufficiency through a range of activities, such as outreach, community education, informal counseling, social support, and advocacy. The integration of CHWs on clinical care teams is a strategy that can be considered to straddle both Domains 3 (health care system interventions) and 4 (community-clinical links).

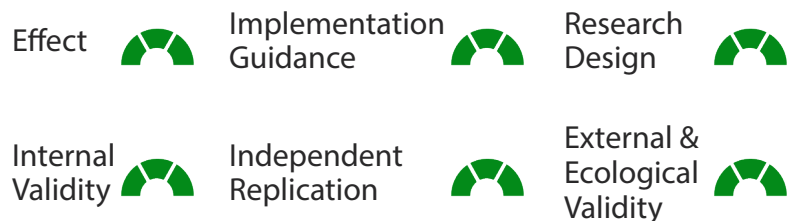
Summary




Integrating CHWs on clinical care teams and in the community is an effective strategy for increasing patient knowledge and medication adherence and lowering blood pressure and cholesterol levels among diverse populations and in various settings.

Stories From the Field:

Clinical-Community Health Worker Initiative, Mississippi State Department of Health.

Evidence of Effectiveness



Legend: Well supported/Supported  Promising/Emerging  Unsupported/Harmful 

Evidence of Impact



Legend: Supported  Moderate  Insufficient 



Evidence of Effectiveness

The evidence base demonstrating the effectiveness of integrating CHWs on clinical care teams is very strong. Research studies examining this intervention have had strong internal and external validity, the Community Preventive Services Task Force concluded that the integrating CHWs on clinical care teams is effective, and trials of interventions that integrated CHWs have been replicated with positive results. Implementation guidance for integrating CHWs on clinical care teams is available from several sources.

Evidence of Impact

Health Impact

Integrating CHWs on clinical care teams or in the community as part of cardiovascular disease (CVD) prevention programs can help program participants lower their blood pressure, cholesterol, and blood sugar levels; reduce their CVD risks; be more physically active; and stop smoking.² It can also improve patient knowledge and adherence to medication regimens and improve health care services.²

Health Disparity Impact

By design, the CHW model seeks to eliminate health disparities because the populations served usually include people who have more barriers to care.³ A Community Preventive Services Task Force review found that most studies on CHWs focused on underserved populations and concluded that the CHW model can be effective in improving health and reducing health disparities related to CVD.²

Economic Impact

A review by the Community Preventive Services Task Force concluded that interventions that integrate CHWs on clinical care teams to prevent CVD are cost-effective.² The median cost of intervention was \$329 (range: \$98 to \$422) per person per year, with the main cost drivers being CHW time, costs for training and supervision of CHWs, and cost for any additional interventions or staff. The median change in health care costs after a CHW intervention was a reduction of \$82 (range: -\$415 to \$14) per person per year.

One well-designed study found a return on investment of 1.8 to 1 for a large health plan that served an underserved urban population. Overall evidence for an estimated net benefit indicated that health care cost savings did not exceed the cost of intervention (median net benefit: -\$311 from seven studies). The median cost per quality-adjusted life year (QALY) saved was \$17,670 (range: \$8,233 to \$24,149), and all estimates were well below the commonly used and conservative threshold of \$50,000 per QALY. The review also noted incomplete reporting or inclusion of major cost drivers in some studies. Future studies should assign a cost to CHW services and time, whether those services are voluntary (unpaid) or otherwise.²



Stories from the Field

Community Health Workers



CHWs at Mississippi Delta Health Collaborative

The Mississippi Delta Health Collaborative implemented the Clinical-Community Health Worker Initiative (CCHWI) to improve clinical outcomes for CVD through aspirin use, hemoglobin A1c control, blood pressure control, cholesterol management, and smoking cessation in the 18-county Mississippi Delta region.¹³ The CCHWI model emphasizes the importance of CHWs as integral members of clinical care teams. CHWs received 160 hours of core competency training and 40 hours of training specific to CVD prevention. About 1,100 patients from six participating health care systems—including FQHCs, Rural Health Centers, and private providers—were enrolled because they were diagnosed with hypertension, diabetes, or dyslipidemia. After 4 years, seven CHWs were integrated into the participating health care systems and their duties included visiting patients in their homes. CHWs worked to meet patients' health care needs through chronic disease self-management workshops, trainings on self-measured blood pressure monitoring, and encouragement of medication adherence. From 2012 to 2016, a 1.3% relative decrease in systolic blood pressure and a 1.7% relative decrease in diastolic blood pressure were observed among patients with hypertension who were enrolled in this program.

For more information:

Tameka Walls, Bureau Director, Mississippi State Department of Health

E-mail: Tameka.Walls@msdh.ms.gov

Websites: <http://msdh.ms.gov/msdhsite/> and www.cdc.gov/dhdsp/docs/field_notes_clinical_community_health_worker.pdf



Four Considerations for Implementation

1 Settings

CHWs have been integrated in a variety of primary care settings, including federally qualified health centers (FQHCs), managed care health systems, patient-centered medical homes, and community pharmacies.¹⁻⁵

2 Policy and Law-Related Considerations

The need for policies to ensure that CHWs are sustainably reimbursed for their contribution to team-based care is a frequently cited concern.^{1,3,4} There is also debate about whether states should require credentialing or certification of CHWs. Proponents of credentialing would like policies to support the consistency of training and certification of CHWs across the country. Opponents are concerned that credentialing could reduce the CHW workforce and decrease access to CHWs who may have intrinsic and invaluable qualities that cannot be certified or credentialed. More information is available from CDC in the form of a [State Law Fact Sheet](#)¹¹ and [Policy Evidence Assessment Report](#)¹² that address this topic.

3 Implementation Guidance

CDC has compiled evidence-based research to support the effectiveness of CHWs in the [Community Health Worker Toolkit](#).⁶ This tool kit also includes information that state health departments can use to train and further build capacity for CHWs in their communities, as well as helpful resources that CHWs can use in their communities.

4 Resources

Many public and private institutions support including CHWs on health care teams. Examples include the following:

- [Centers for Disease Control and Prevention's 6|18 Initiative](#).⁷
- [CDC's Million Hearts Initiative](#).⁸
- [The Institute of Medicine and National Academies Press](#).⁹
- [Centers for Medicare & Medicaid Services](#).¹⁰



References

1. Centers for Disease Control and Prevention. *Technical Assistance Guide: States Implementing Community Health Worker Strategies for the Centers for Disease Control and Prevention's "State Public Health Actions to Prevent and Control Diabetes, Heart Disease, Obesity and Associated Risk Factors and Promote School Health" Program*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2015.
2. Community Preventive Services Task Force. The Guide to Community Preventive Services website. Cardiovascular Disease: Interventions Engaging Community Health Workers. <https://www.thecommunityguide.org/findings/cardiovascular-disease-prevention-and-control-interventions-engaging-community-health>. Accessed October 26, 2016.
3. Gutierrez Kapheim M, Campbell J. *Best Practice Guidelines for Implementing and Evaluating Community Health Worker Programs in Health Care Settings*. Chicago, IL: Sinai Urban Health Institute; 2014.
4. Franklin CM, Bernhardt JM, Lopez RP, Long-Middleton ER, Davis S. Interprofessional teamwork and collaboration between community health workers and healthcare teams: an integrative review. *Health Serv Res Manag Epidemiol*. 2015;2.
5. Verhagen I, Steunenberg B, de Wit NJ, Ros WJG. Community health worker interventions to improve access to health care services for older adults from ethnic minorities: a systematic review. *BMC Health Serv Res*. 2014;14:497.
6. Centers for Disease Control and Prevention. *Community Health Worker (CHW) Toolkit*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2016.
7. Centers for Disease Control and Prevention. The 6|18 Initiative: Accelerating Evidence into Action website. <https://www.cdc.gov/sixteen/>. Accessed February 1, 2017.
8. Million Hearts website. <https://millionhearts.hhs.gov/index.html>. Accessed February 16, 2017.
9. Smedley BD, Stith AY, Nelson AR, eds. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: The National Academies Press; 2002.
10. Medicaid and Children's Health Insurance Programs: Essential Health Benefits in Alternative Benefit Plans, Eligibility Notices, Fair Hearing and Appeal Processes, and Premiums and Cost Sharing; Exchanges: Eligibility and Enrollment. *Fed Regist*. 2013;78.
11. Centers for Disease Control and Prevention. *State Law Fact Sheet: A Summary of State Community Health Worker Laws*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2016.
12. Centers for Disease Control and Prevention. *Policy Evidence Assessment Report: Community Health Worker Policy Components*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2014.
13. Centers for Disease Control and Prevention. *Field Notes: Clinical Community Health Worker Initiative*. https://www.cdc.gov/dhds/docs/fieldnotes/clinical_community_health_worker.pdf. Accessed February 20, 2017.



Community Pharmacists and Medication Therapy Management

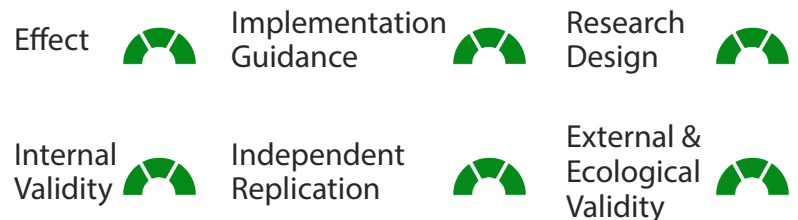
Medication therapy management (MTM) is a distinct service or group of services provided by health care providers, including pharmacists, to ensure the best therapeutic outcomes for patients. MTM includes five core elements: medication therapy review, a personal medication record, a medication-related action plan, intervention or referral, and documentation and follow-up. Within the context of cardiovascular disease (CVD) prevention, MTM can include a broad range of services, often centering on (1) identifying uncontrolled hypertension (2) educating patients on CVD and medication therapies, and (3) advising patients on health behaviors and lifestyle modifications for better health outcomes. MTM is especially effective for patients with multiple chronic conditions, complex medication therapies, high prescription costs, and multiple prescribers. MTM can be performed by pharmacists with or without a collaborative practice agreement (CPA), and it is a strategy that can be considered to straddle both Domains 3 (health care system interventions) and 4 (community-clinical links).

Summary

MTM is care provided by pharmacists with the goal of ensuring the most effective use of drug therapy. It is a cost-effective strategy for increasing patient knowledge and medication adherence and lowering blood pressure.

Stories From the Field:
Ohio Department of Health.

Evidence of Effectiveness



Legend: Well supported/Supported Promising/Emerging Unsupported/Harmful

Evidence of Impact



Legend: Supported Moderate Insufficient



Evidence of Effectiveness

Strong evidence exists that the use of MTM by pharmacists is effective. Although the exact combination of MTM activities tends to vary between settings, studies examining MTM have generally found it to be effective and to have strong internal and external validity. MTM trials have been replicated in many different contexts with positive results. Implementation guidance on MTM is available from several sources, including the guidance provided under Medicare Part D.

Evidence of Impact

Health Impact

In 2015, the Agency for Healthcare Research and Quality (AHRQ) found the evidence behind MTM to be insufficient because of inconsistency in the operationalization of MTM across studies, but concluded that MTM can improve medication adherence.¹ MTM has been shown to be effective for lowering systolic and diastolic blood pressure; lowering LDL cholesterol and other health indicators (e.g., glycosylated A1C, HBA1c); increasing patient knowledge; improving patient quality of life and medication adherence; and improving the safe and effective use of medications, including reducing therapeutic duplication, decreasing total medications prescribed, and increasing adherence for therapeutic care.²⁻⁸

Health Disparity Impact

Expanding the pharmacist's role through MTM is likely to increase access to health care for populations facing the most barriers to care. However, few studies have examined the ability of MTM to reduce health disparities in CVD outcomes. Although some evidence exists that MTM can achieve positive outcomes among minority and low-income populations, the extent of this evidence is limited and inconsistent.^{4,5} More research is needed to directly examine the effect of MTM on different populations.

Economic Impact

Studies have indicated that MTM can produce health care cost savings and a positive ROI for health care systems.⁹⁻¹¹ A study that examined the effect of providing MTM in a large health system for over 10 years found that the cost to providing MTM services was \$76 per patient encounter, and the return on investment (ROI) that resulted from health care cost savings was \$1.29 per \$1 spent on MTM services over this period.¹⁰

Another study that evaluated the use of MTM by a self-insured employer reported an intervention cost of \$145.61 per patient and a ROI to the payer of \$1.67 per \$1 of MTM costs over a 6-month period.¹¹ Despite early findings of potential economic benefits, recent meta-analyses and systematic reviews have identified a need for better cost-effectiveness data on expanded pharmacist care.^{7,8}



Strong evidence exists that the use of MTM by pharmacists is effective.

Stories from the Field

Medication Therapy Management



MTM at Ohio Department of Health

In 2014, the Ohio Department of Health (ODH) teamed up with three Federally Qualified Health Centers (FQHC) sites to assess the effect of MTM counseling sessions on patients with hypertension. This effort involved collaboration among the Ohio State University College of Pharmacy, Ohio Pharmacists Association, Ohio Association of Community Health Centers, and the Health Services Advisory Group. These partners helped plan and develop the assessment. Pharmacists administered MTM to 5,000 patients with hypertension who were receiving care at one of the three FQHC sites. After 6 months, assessments found that hypertension control had increased to 68.6% among these patients. There were key components related to the project's achievement, which included maintaining relevant partnerships, implementing the pilot in one type of pharmacy setting, allowing FQHC sites to develop their own protocols for patient enrollment, using effective dissemination processes, and selecting data points that align with current pharmacy practices. Challenges included finding champions for the MTM model.

For more information:

Jen Rodis, Assistant Dean for Outreach and Engagement

Ohio State University College of Pharmacy

E-mail: rodis.2@osu.edu

Website: www.ohiochc.org



Four Considerations for Implementation

1 Settings

MTM has been implemented in several settings, including federally qualified health centers, patient-centered medical homes, managed care health systems, community pharmacies, hospital pharmacies, and primary care clinics.

2 Policy and Law-Related Considerations

MTM is currently supported under the Centers for Medicare & Medicaid Services (CMS), as a service available to selected Medicare beneficiaries. As a part of Medicare Part D regulations, enrollees with multiple chronic diseases who are taking multiple Part D drugs are [eligible for MTM programs](#).¹² Outside of the CMS guidelines, reimbursement for time and services is a key issue for pharmacists performing MTM. Regional variations in training and scope of practice can limit pharmacists when they attempt to provide MTM services. For MTM to work most effectively, pharmacists and prescribers can develop CPAs with shared blood pressure management protocols. Other policy considerations that need attention are determining the inclusion criteria for patients to receive MTM and encouraging payers to make the service available and offer reimbursement for pharmacists.

3 Implementation Guidance

Implementation guidance has been developed by various organizations, including:

- [Centers for Medicare & Medicaid Services](#).¹²
- American Pharmacists Association's [MTM Central](#),¹³ which includes implementation guidance, an MTM resource library, and information about the added value of MTM.

4 Resources

Several federal agencies are working on initiatives that focus on greater involvement of pharmacists in cardiovascular prevention and MTM. They include the following:

- [Centers for Medicare & Medicaid Services](#).¹²
- AHRQ, which provides the [National Guideline Clearinghouse](#)¹⁴ and a list of resources related to [innovations in MTM](#).¹⁵
- [CDC's 6|18 Initiative](#).¹⁶
- [CDC's Million Hearts Initiative](#).¹⁷



References

1. Viswanathan M, Kahwati L, Golin C, et al. Medication therapy management interventions in outpatient settings. *JAMA Intern Med.* 2015;175(1):76–87.
2. Theising KM, Fritschle TL, Scholfield AM, Hicks EL, Schymik ML. Implementation and clinical outcomes of an employer-sponsored, pharmacist-provided medication therapy management program. *Pharmacotherapy.* 2015;35(11):e159–e163.
3. Tsuyuki RT, Johnson JA, Teo KK, et al. A randomized trial of the effect of community pharmacist intervention on cholesterol risk management: the Study of Cardiovascular Risk Intervention by Pharmacists (SCRIP). *Arch Intern Med.* 2002;162(10):1149–1155.
4. Carter BL, Barnette DJ, Chrischilles E, Mazzotti GJ, Asali ZJ. Evaluation of hypertensive patients after care provided by community pharmacists in a rural setting. *Pharmacotherapy.* 1997;17(6):1274–1285.
5. Chabot I, Moisan J, Grégoire J-P, Milot A. Pharmacist intervention program for control of hypertension. *Ann Pharmacother.* 2003;37(9):1186–1193.
6. Cheema E, Sutcliffe P, Singer DRJ. The impact of interventions by pharmacists in community pharmacies on control of hypertension: a systematic review and meta-analysis of randomized controlled trials. *Br J Clin Pharmacol.* 2014;78(6):1238–1247.
7. Santschi V, Chiolo A, Colosimo AL, et al. Improving blood pressure control through pharmacist interventions: a meta-analysis of randomized controlled trials. *J Am Heart Ass.* 2014;3(2).
8. Ryan R, Santesso N, Lowe D, et al. Interventions to improve safe and effective medicines use by consumers: an overview of systematic reviews. *Cochrane Database Syst Rev.* 2014(4):CD007768.
9. Isetts B, Schondelmeyer S, Artz M, et al. Clinical and economic outcomes of medication therapy management services: the Minnesota experience. *J Am Pharm Assoc.* 2008;48:203–211.
10. Ramalho de Oliveira D, Brummel A, Miller D. Medication therapy management: 10 years of experience in a large integrated health care system. *J Manag Care Pharm.* 2010;16(3):185–195.
11. Wittayanukorn S, Westrick S, Hansen R, et al. Evaluation of medication therapy management services for patients with cardiovascular disease in a self-insured employer health plan. *J Manag Care Pharm.* 2013;19(5):385–395.
12. Centers for Medicare & Medicaid Services. Medication Therapy Management website. <https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovContra/MTM.html>. Accessed February 21, 2017.
13. American Pharmacists Association. APhA MTM Central website. Implementing MTM in Your Practice. <https://www.pharmacist.com/implementing-mtm-your-practice>. Accessed February 21, 2017.
14. Agency of Healthcare Research and Quality. Improving medication management for older adult clients website. <https://www.guideline.gov/summaries/summary/37826/improving-medication-management-for-older-adult-clients?q=assisted+living>. Accessed August 18, 2017.
15. Agency of Healthcare Research and Quality. Innovations in Medication Therapy Management website. <https://innovations.ahrq.gov/issues/2015/02/18/innovations-medication-therapy-management>. Accessed February 21, 2017.
16. Centers for Disease Control and Prevention. The 6|18 Initiative: Accelerating Evidence into Action website. <https://www.cdc.gov/sixteen/>. Accessed February 1, 2017.
17. Million Hearts. *Cardiovascular Health Medication Adherence: Action Steps for Public Health Practitioners*. Atlanta, GA: Centers for Disease Control and Prevention and Centers for Medicare & Medicaid Services; 2016.

Appendices

Appendix A. Summary of Effective CVD Prevention Strategies

		Evidence of Effectiveness						Evidence of Impact			
Strategy	Effect	Internal Validity	Research Design	Independent Replication	Implementation Guidance	External and Ecological Validity	Health Impact	Health Disparity Impact	Economic Impact		
Domain 3: Health Care Systems	Promoting Team-Based Care to Improve Hypertension Control										
	Pharmacy: Collaborative Practice Agreements to Enable Collaborative Drug Therapy Management										
	Self-Measured Blood Pressure Monitoring with Clinical Support										
	Self-Management Support and Education										
	Reducing Out-of-Pocket Costs for Medications										
	Implementing Clinical Decision Support Systems										
	Integrating Community Health Workers on Clinical Care Teams and in the Community										
Domain 4: Community-Clinical Links	Community Pharmacists and Medication Therapy Management										

Well supported/
SupportedPromising/
EmergingUnsupported/
Harmful

Supported



Moderate



Insufficient

Appendix B. Rapid Synthesis and Translation Process (RSTP)

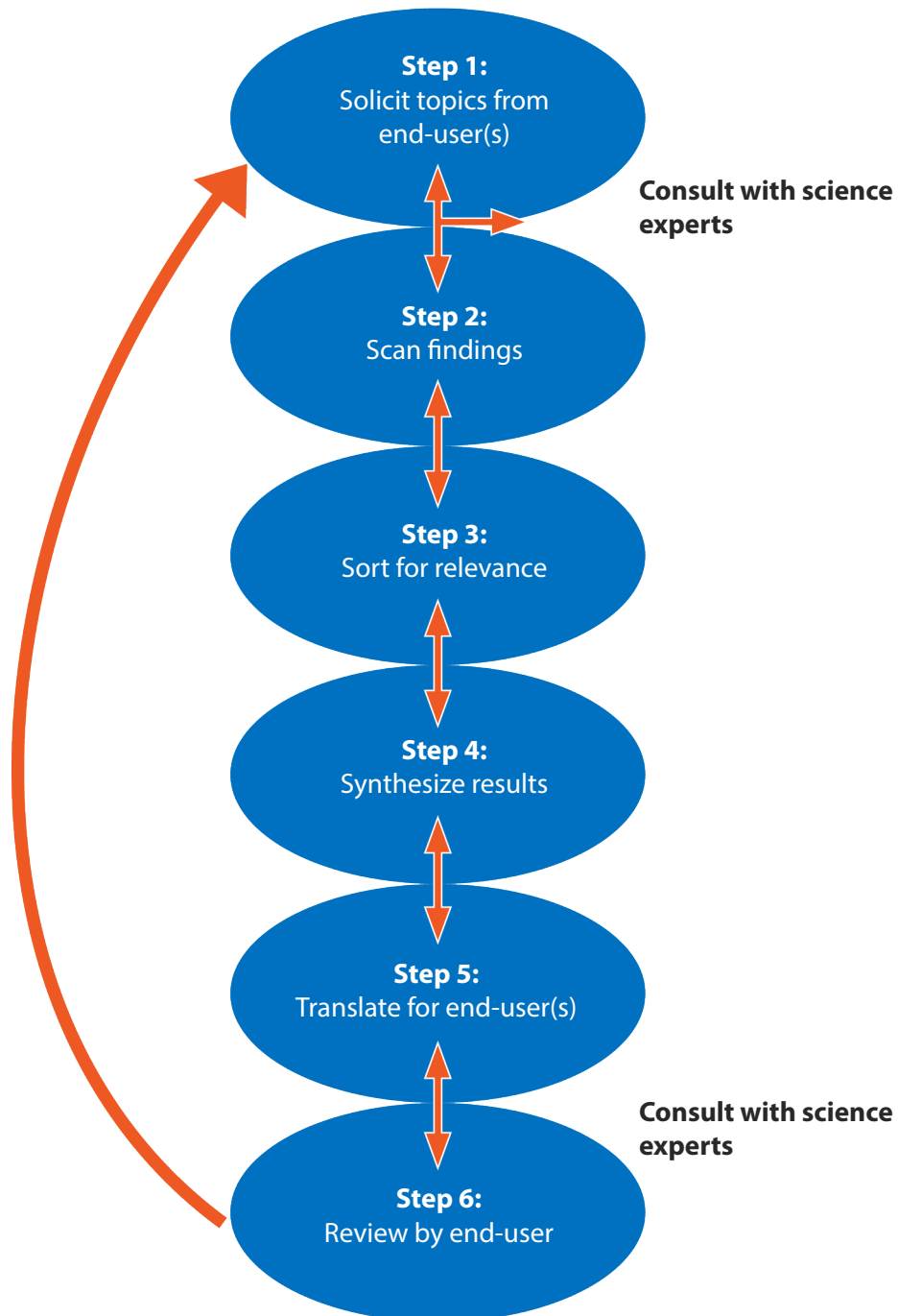
As part of the process of developing the *Best Practices Guide for CVD Prevention*, we adapted the Rapid Synthesis and Translation Process (RSTP) to provide a structure for engaging both subject matter experts (SMEs) and health care practice partners. This conceptual process, developed within CDC's Division of Violence Prevention in the National Center for Injury Prevention and Control, consists of six fundamental steps ([Figure 2](#)), which do not necessarily occur in chronological order.

The following steps and related definitions are applied in our adaptation of the RSTP framework:

- **Step 1: Solicit Topics from End Users** — For the *Best Practices Guide for CVD Prevention*, “end users” were grantees (health care practitioners), evaluators (internal), content SMEs (internal and external), and program specialists (internal).
- **Step 2: Scan Findings** — The *Best Practices Guide for CVD Prevention* development team in CDC's Division for Heart Disease and Stroke Prevention (DHDSP) reviewed the research literature to identify evidence-based strategies for preventing cardiovascular disease (CVD). The strategies determined to be potential best practices were moved to Step 3.
- **Step 3: Sort for Relevance** — Criteria for including strategies in the *Best Practices Guide for CVD Prevention* were determined according to an internal vetting process that included division and branch leadership, internal SMEs, and external SMEs. A group of grantees was also asked to identify practice-based relevance for each strategy.
- **Step 4: Synthesize Results** — Internal SMEs used the Continuum of Evidence of Effectiveness to assess the evidence behind the identified strategies. This interactive, online tool uses a series of questions about each strategy to place it on a continuum of six dimensions of evidence (see [Appendix C](#) for more information). Once this baseline assessment of the evidence was done, only strategies with results and methodology in the highest category (i.e., supported or well-supported) were considered further. The availability of implementation guidance was not a requirement for inclusion. Selected strategies were then reviewed for fit with the best practices framework to assess their potential to improve cardiovascular health, reduce health disparities, and demonstrate economic sustainability.
- **Step 5: Translate to End User(s)** — A small team in DHDSP used the data collected from the SME assessments, the best practice framework review, and additional input from internal program and evaluation experts to draft the *Best Practices Guide for CVD Prevention*.
- **Step 6: Review by End User(s)** — Standard processes for clearance by CDC and the US Department of Health and Human Services were initiated after additional review by a panel of grantees, SMEs, and other potential end users.

For more information on the best practices framework, see Spencer LM, Schooley MW, Anderson LA, et al. Seeking Best Practices: A Conceptual Framework for Planning and Improving Evidence-Based Practices. *Prev Chronic Dis*. 2013;10:130186. doi: <http://dx.doi.org/10.5888/pcd10.130186>.

Figure 2. Rapid Synthesis and Translation Process (RSTP)



Adapted figure from: Thigpen S, Puddy RW, Singer HH, Hall DM. Moving knowledge into action: developing the Rapid Synthesis and Translation Process within the Interactive Systems Framework. *Am J Community Psychol*. 2012;50(3-4):285–294.

Appendix C. Understanding the Continuum of Evidence of Effectiveness Tool

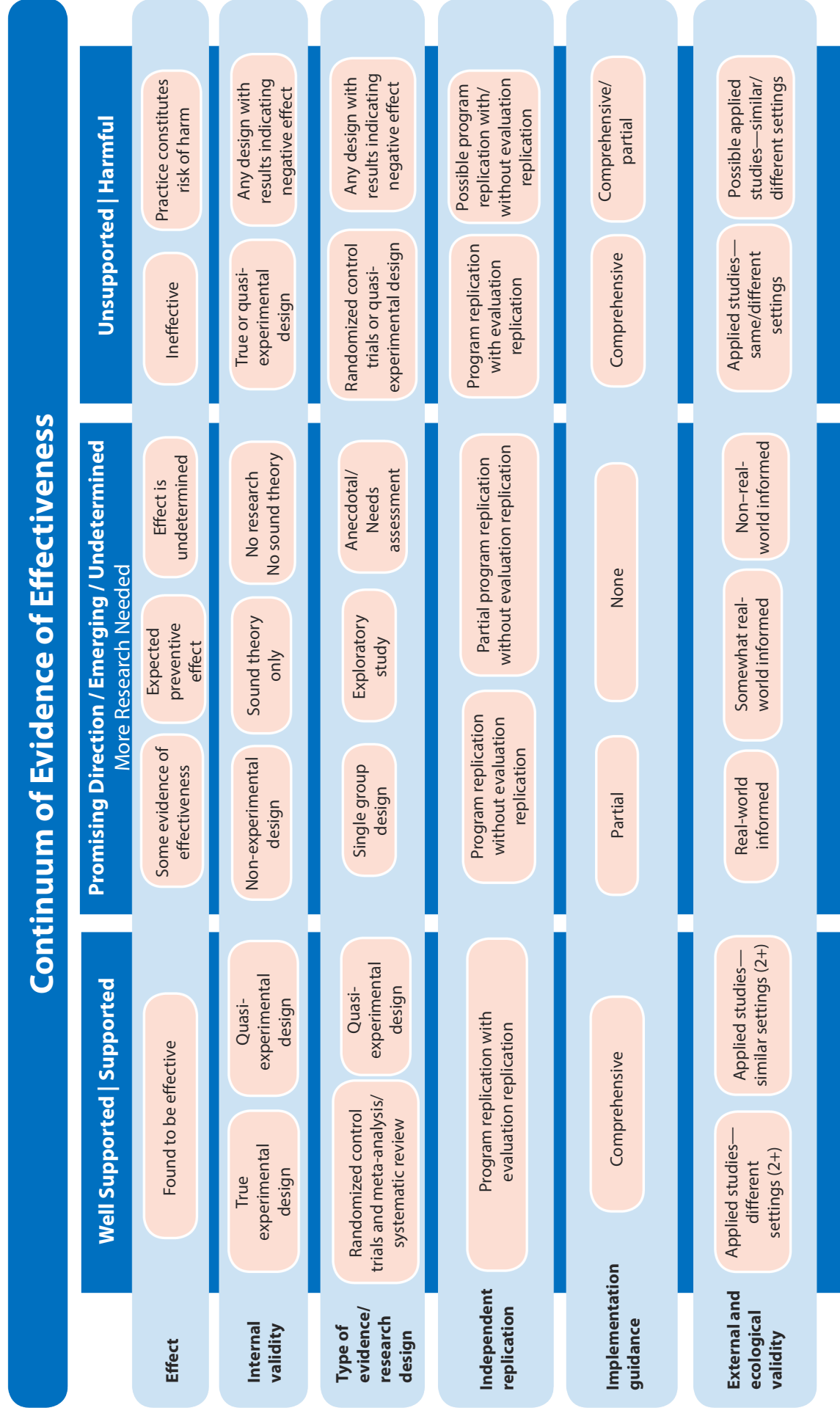
The Continuum of Evidence of Effectiveness (hereafter called the Continuum) tool clarifies and defines standards for assessing research evidence. Because of its ability to determine the strength of evidence on the basis of a clear and universal set of standards, the Continuum was chosen as the mechanism to rate the evidence behind the strategies included in the *Best Practices Guide for CVD Prevention*. This interactive, online tool was developed in 2007 by CDC’s Division of Violence Prevention in the National Center for Injury Prevention and Control. The division needed a way to provide coherent and consistent language around the word “evidence” in programmatic activities. Division staff synthesized information about program effectiveness from the research literature, subject matter experts, and practitioners with experience implementing strategies in the field. This information guided the development of the Continuum, which assesses various components to determine the strength of the best available research evidence on a program, practice, or policy. The Continuum also illuminates the strengths and weaknesses of the research evidence and offers guidance on next steps for consideration.

Although this tool was developed to be applied specifically to the field of violence prevention, it can be used to guide evidence-based decision making in a wide range of health-related areas. In developing the *Best Practices Guide for CVD Prevention*, two knowledgeable reviewers used this tool to rate the evidence for each strategy considered for inclusion in this publication. Any discrepancies between the reviewers’ results were resolved through discussion.

The structure and range of possible results from the Continuum tool are shown in [Figure 3](#). The Continuum has six evidence dimensions, which are listed vertically down the left side of the figure. It has three overarching categories of evidence strength, which are listed horizontally across the top of the figure. The Continuum uses the reviewer’s input for a specific program or strategy to determine the strength of evidence for each dimension and assign a corresponding strength category for each dimension. The full range of responses for each dimension is shown in [Figure 3](#). Definitions and possible results for the six dimensions are provided in a [table](#) after the figure.









For more information about the Continuum of Evidence of Effectiveness, see CDC’s 2011 publication, *Understanding Evidence Part 1: Best Available Research Evidence. A Guide to the Continuum of Evidence of Effectiveness*.







Figure 3. Continuum of Evidence of Effectiveness


















Adapted figure from: Puddy, R. W. & Wilkins, N. (2011). *Understanding Evidence Part 1: Best Available Research Evidence. A Guide to the Continuum of Evidence of Effectiveness*. Atlanta, GA: Centers for Disease Control and Prevention.

Table 1. Possible Results and Definitions of the Six Dimensions of the Continuum of Evidence Effectiveness Tool

Dimensions and Possible Results	Definitions
Effect: The strategy's ability to reduce cardiovascular disease (CVD) or related risk factors or outcomes.	
Found to be effective 	Prevention strategies that are found to be effective are those that are based on sound theory, have been evaluated in at least two well-conducted studies, and have demonstrated significant, short-term or long-term preventive effects, depending on intent and design.
Some evidence of effectiveness 	Some programs may not have two or more rigorous evaluations to demonstrate short-term or long-term preventive effects, but they are based on sound theory and have been rigorously evaluated, and the results indicate that they may produce preventive outcomes.
Expected preventive effect 	Some programs may be grounded in theory and have been evaluated with a less rigorous design, or they may have been evaluated for short-term or long-term preventive effects that are different from the outcomes of interest.
Effect is undetermined 	Prevention programs that have not been evaluated or that have been evaluated poorly (with neither a true nor quasi-experimental design), whether or not they are based on sound theory, are considered to have undetermined effectiveness. It is not known whether these programs produce short-term or long-term preventive effects.
Ineffective 	Ineffective strategies are those that have been evaluated in at least two well-conducted studies and have demonstrated no significant short-term or long-term outcomes in these evaluation studies.
Practice constitutes risk of harm 	A prevention strategy is considered to be harmful if there is an indication that it causes harmful outcomes. This includes short-term outcomes, long-term outcomes, and/or unexpected outcomes. These harmful outcomes may be due to the inherent nature of the program, its implementation, an interaction with certain population-related factors, or an interaction with certain context/setting-related factors.
Internal Validity: The extent to which the short-term and long-term outcomes of a strategy can truly be attributed to the strategy itself.	
True experimental design 	True experiments are considered highest in internal validity because participants are randomly assigned to the treatment and control conditions. This helps assess whether the program, practice, or policy is likely responsible for changes in outcomes or if something else could be causing them. The strongest experimental designs also have multiple measurement points. These experiments are able to measure not only differences in outcomes between treatment and control groups, but also changes in outcomes over time. This helps to assess whether the demonstrated effects are sustained over time.
Quasi-experimental design 	<p>Quasi-experiments are also considered to have high internal validity, although less so than true experiments. Quasi-experiments are based on sound theory and typically have comparison groups (but no random assignment of participants to condition) and/or multiple measurement points.</p> <p>Some quasi-experimental designs are used to evaluate policy changes or naturally occurring experiments. These evaluations may not have a comparison group but include multiple waves of observation both before and after the introduction of a treatment.</p>

Dimensions and Possible Results	Definitions
Nonexperimental design 	<p>Relative to experimental and quasi-experimental designs, nonexperimental studies are the weakest of the three in terms of internal validity. Even though these designs are not as rigorous as true and quasi-experiments, they may still be based on sound theory and include some empirical aspects geared toward internal validity. Nonexperimental studies do not have a control or comparison group or multiple measurement points, making it difficult to attribute observed changes to the program.</p>
Sound theory only 	<p>Prevention programs based on sound theory only are also unable to establish or attribute observed changes to the program as those based on experimental or quasi-experimental studies. These programs are often exploratory in nature and are rooted in well-established research and subject matter expert opinion, suggesting that the program and/or its components may modify known risk or protective factors and produce preventive outcomes.</p>
No research, no sound theory 	<p>Programs not based on research or sound theory are considered weakest of all in terms of establishing an empirical link to a preventive outcome. In the absence of research or sound theory, there is no evidence to suggest that they are likely to modify known risk/protective factors or produce preventive outcomes.</p> <p>Some, however, may have face validity. This type of validity is concerned with how a measure or procedure appears and whether it seems reasonably well designed and reliable. Unlike other forms of validity, face validity does not depend on established theories for support.</p>
Research Design: The soundness of individual research method components.	
Randomized control trial and meta-analysis or systematic review 	<p>Randomized control trials are true experiments and considered a highly rigorous research design. They are the strongest research design for establishing a cause-effect relationship. Randomized control trials have a control group and randomly assign participants to the control or treatment condition.</p> <p>Systematic reviews collect information from a number of scientific studies on a specific topic for the purpose of summarizing, analyzing, and interpreting the overall scientific findings on that topic.</p> <p>A meta-analysis is a type of systematic review that uses statistical analyses to combine and analyze the data from single scientific studies on a specific topic and uses these combined findings to generate a single estimate or effect size to make more conclusive statements about the topic. The strongest reviews are conducted independently, consist of studies that were conducted independent from one another, consist of studies that are comparable, and include some form of empirical analysis to draw broader, general conclusions about the effectiveness of a strategy.</p>
Quasi-experimental design 	<p>If a design uses multiple groups without random assignment or includes multiple measurement points, it is considered quasi-experimental. Quasi-experimental designs are considered rigorous designs, although not as rigorous as randomized control trials because participants are not randomly assigned to treatment and control conditions and may not be equivalent from the start. In this respect, they are weaker in controlling threats to internal validity than randomized control trials.</p>
Single group design 	<p>The single group design is not considered as rigorous as the randomized control trial or quasi-experimental designs because it does not include a control or comparison group. Single group designs may also have just one post-measure or they may include pre- and post-measures.</p>

Dimensions and Possible Results	Definitions
Exploratory studies 	Exploratory studies are focused on learning about a program and the phenomena it addresses. Exploratory studies are based on sound theory derived from prior research and/or knowledge from subject matter experts. The information gleaned from an exploratory study may point to risk and protective factors that are potentially important to consider in developing or refining a prevention strategy or its components. Some descriptive and observational studies may also be considered exploratory studies.
Anecdotal or needs assessment 	Studies not based on empirical research or sound theory are the weakest with respect to research design. Studies that are based on anecdotal information, needs assessments, or windshield surveys are examples of this kind of research.
Independent Replication: Implementation and evaluation of a program by researchers or practitioners who were unaffiliated with the original program and who do not have any known conflicts of interest.	
Program replication with evaluation replication 	Programs that demonstrate the most reliability (ability to repeatedly produce the preventive effects) are those that have been replicated at least once by independent researchers or practitioners, in a similar setting to the original program, using a rigorous research design, and with high fidelity to the original program.
Program replication without evaluation replication 	Programs that demonstrate some reliability are those implemented with high fidelity to the original program and in settings that are similar to the setting of the original program. These replications may or may not be conducted by independent researchers/practitioners. Finally, these replications have not been evaluated in the same way as the original evaluation of the program.
Partial program replication without evaluation replication 	Programs that demonstrate weak reliability are those that are partially replicated and have not been evaluated. These replications may or may not be conducted by independent researchers/practitioners. Programs that are the weakest in reliability are those that are not replicated at all since there is no way to measure their reliability.
Possible program replication with or without evaluation replication 	If a program demonstrates harmful effects, it should not be replicated. In some cases, harmful effects may not have occurred during the original implementation of a prevention strategy but may occur in its replication. Evaluations may or may not have been conducted of this replication since a formal evaluation is not needed to prove harm. Once harmful effects have been associated with a program, either in the original or during a replication, no subsequent replications should be conducted.
Implementation Guidance: The availability of any and all services or materials that could help in the implementation of a strategy in different settings.	
Comprehensive 	Comprehensive guidance is the most effective way of ensuring that a program is carried out with fidelity in a different setting. This entails availability and accessibility of any products, services, or activities that facilitate proper implementation in a new setting. These products and services include training, coaching, technical assistance, support materials, organizational/systems change consultation, and manuals/guides, and may be offered by the program's developers or some other entity.
Partial 	For some programs, there may be some products, services, or activities to help researchers/practitioners implement them in different settings, but they may be limited in their availability and accessibility. It is important to note that since implementation support and guidance are limited for these programs, there is a chance that implementation issues may be influencing outcomes.
None 	Programs that do not have any products, services, or activities available to help researchers/practitioners implement them in a different setting run a high risk of experiencing implementation issues. This also means there is a significant chance that implementation issues may be influencing outcomes.

Dimensions and Possible Results	Definitions
External and Ecological Validity: Whether a program has been evaluated among diverse populations and in different contexts.	
Two or more applied studies: different settings 	Programs that demonstrate the highest external and ecological validity are those that have been implemented in two or more applied (“real-world”) settings that are distinct from both the original setting and each other in terms of their populations and physical/geographical locations.
Two or more applied studies: same settings 	Some programs have been implemented in two or more applied (“real-world”) settings that are similar to one another with similar populations. These prevention strategies demonstrate moderate external and ecological validity although not as much as those implemented in two or more settings that are different and that have different populations.
Real-world–informed 	Programs that have not been implemented in applied settings may still demonstrate some external and ecological validity if they are made up of components that are consistent with an applied setting. Likewise, programs may demonstrate external and ecological validity if they are implemented in ways that mirror conditions of the “real-world.”
Somewhat real-world–informed 	Some programs have not been implemented in applied settings and are not structured and implemented in ways that are completely consistent with an applied setting. These prevention strategies demonstrate some external and ecological validity if some of their components and implementation approximate conditions in the “real world.”
Not real-world–informed 	Programs that demonstrate the least amount of external and ecological validity are those whose basic components are not consistent with an applied setting and are not implemented in ways that mirror conditions of the “real world.” While it is not known whether these programs will be effective in applied settings, there is no way to measure which aspects work well across different settings and populations or which aspects are setting-specific.
Possible applied studies in similar or different settings 	Programs that demonstrate harm in any kind of a setting, applied or otherwise, are considered harmful. In other words, the program is considered harmful regardless of whether or not it has been conducted in an applied setting.

Appendix D. Glossary

Best practice: A practice supported by a rigorous process of peer review and evaluation indicating effectiveness in improving health outcomes, generally demonstrated through systematic reviews.

Best practices framework: A conceptual framework that includes important aspects of impact and quality to provide a common lexicon and criteria for assessing and strengthening public health practice.

Clinical decision support system (CDSS): A program that analyzes data entered into an electronic health record to trigger reminders, flags, and treatment protocols to help health care providers make clinical decisions.

Collaborative drug therapy management (CDTM): Qualified pharmacists are permitted to assume professional responsibility for performing a full scope of services (e.g., ordering drug-therapy laboratory tests; administering drugs; and selecting, initiating, monitoring, continuing, and adjusting drug regimens). Authority of CDTM is defined in the state's pharmacy practice within the scope of practice section.

Collaborative practice agreements (CPAs): A strategy to expand the pharmacist's role in team-based care with other providers and improving health outcomes. The range of services authorized under each state's practice act varies.

Community Guide (The Guide to Community Preventive Services): A resource with a collection of evidence-based findings from the Community Preventive Services Task Force (Task Force). This resource was created to help states, communities, community organizations, business, health care organizations, and schools select interventions to improve health and prevent disease.

Community health worker (CHW): The American Public Health Association defines a CHW as a "frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community being served. This trusting relationship enables the CHW to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery. In addition, a CHW builds individual and community capacity to improve health outcomes by increasing health knowledge and self-sufficiency through a range of activities such as outreach, community education, informal counseling, the provision of social support and advocacy."

Community Preventive Services Task Force (Task Force): An independent, nonfederal, unpaid panel of public health and prevention experts that provides evidence-based findings and recommendations about community preventive services, programs, and policies to improve health. Findings are summarized within the Guide to Community Preventive Services. The Task Force issues findings based on systematic reviews of effectiveness and economic evidence that are conducted with a methodology developed by the Community Guide Branch, which is based at CDC.

Community programs linked to clinical services: A term to describe connecting community programs with health care systems to improve disease prevention, care, and management.

Continuum of Evidence of Effectiveness: A tool to describe and assess various components in determining the strength of the best available research evidence on a program, practice, or policy's effectiveness. It illuminates the strengths and weaknesses of the research evidence and offers guidance on next steps for consideration. It consists of six dimensions, each of which addresses a specific aspect of the best available research evidence (e.g., effect, internal validity, research design, independent replication, implementation guidance, and external and ecological validity).

Effect: One of the six dimensions of CDC's Continuum of Evidence of Effectiveness. Effectiveness is important because it tells us whether a prevention strategy is having an impact on the outcomes of interest. The most effective strategies produce preventive effects in the short term, long term, or both. The effectiveness of a strategy is based on its intent and design.

E-Prescribing: A prescriber's ability to electronically send an accurate, error-free and understandable prescription directly to a pharmacy from the point-of-care. This is an important element in improving the quality of patient care.

External ecological validity: One of the six dimensions of CDC's Continuum of Evidence of Effectiveness. External validity refers to whether a program, practice, or policy can demonstrate preventive effects among a wide range of populations and contexts. Ecological validity refers to whether the program components and procedures approximate the "real-life" conditions specific to a specific setting.

Health care system interventions: Effective delivery and use of quality care and preventive services in clinical settings.

Implementation guidance: One of the six dimensions of CDC's Continuum of Evidence of Effectiveness. This includes any and all services and/or materials that aid in the implementation of a prevention strategy in a different setting, including but not limited to "training, coaching, technical assistance, support materials, organizational/systems change consultation, and manuals/guides."

Independent replication: One of the six dimensions of CDC's Continuum of Evidence of Effectiveness. This helps determine whether or not a prevention program can be replicated and implemented with other participants, and produce the same effects. Independent replications are not used to determine whether a program can be successfully generalized to a broad variety of settings or populations.

Internal validity: One of the six dimensions of CDC's Continuum of Evidence of Effectiveness. This refers to the extent to which the short-term and/or long-term outcomes of a program, practice, or policy can truly be attributed to it or if these outcomes could have been caused by something else.

Medication therapy management (MTM): According to the American Pharmacists Association (APhA), "MTM is a service or group of services that optimize therapeutic outcomes for individual patients. Medication therapy management services include medication therapy reviews, pharmacotherapy consults, anticoagulation management, immunizations, health and wellness programs and many other clinical services. Pharmacists provide medication therapy management to help patients get the best benefits from their medications by actively managing drug therapy and by identifying, preventing and resolving medication-related problems."

Public health domains of chronic disease prevention: Four key domains of CDC's National Center for Chronic Disease Prevention and Health Promotion, which include (1) epidemiology and surveillance, (2) environmental approaches, (3) health care system interventions, and (4) community programs linked to clinical services.

Rapid Synthesis and Translation Process (RSTP) Framework: A six-step process developed by and for CDC's Division of Violence Prevention in collaboration with partners in order to expedite the transfer of research knowledge to practitioners, specifically to prevent violence. The six-steps include the following: (1) topics suggested by end user(s); (2) scan findings; (3) sort for relevance; (4) synthesize results; (5) translate for end user(s); and (6) end user expert review.

Self-measured blood pressure monitoring (SMBP): The regular measurement of blood pressure by the patient outside the clinical setting, either at home or elsewhere. It is sometimes known as "home blood pressure monitoring."

Team-based care: Team-based health care is the provision of health services to individuals, families, and/or their communities by at least two health providers who work collaboratively with patients and their caregivers—to the extent preferred by each patient—to accomplish shared goals within and across settings to achieve coordinated, high-quality care.

Type of evidence or research design: One of the six dimensions of CDC's Continuum of Evidence of Effectiveness. The nature of the design of the research study determines whether and how to answer the research questions related to effectiveness. The more rigorous the research design, the higher its internal validity and the more likely outcomes can be attributed to the program, practice, or policy.

For more information, please contact Centers for Disease Control and Prevention
1600 Clifton Road NE, Atlanta, GA 30333
Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
Email: cdcinfo@cdc.gov
Website: www.cdc.gov

KNOW THE FACTS ABOUT

High Blood Pressure



What is high blood pressure?

Blood pressure is the force of blood against your artery walls as it circulates through your body. Blood pressure normally rises and falls throughout the day, but it can cause health problems if it stays high for a long time. High blood pressure can lead to heart disease and stroke—leading causes of death in the United States.¹

Are you at risk?

One in three American adults has high blood pressure—that's an estimated 67 million people.² Anyone, including children, can develop it.

Several factors that are beyond your control can increase your risk for high blood pressure. These include your age, sex, and race or ethnicity. But you can work to reduce your risk by eating a healthy diet, maintaining a healthy weight, not smoking, and being physically active.

What are the signs and symptoms?

High blood pressure usually has no warning signs or symptoms, so many people don't realize they have it. That's why it's important to visit your doctor regularly. Be sure to talk with your doctor about having your blood pressure checked.

How is high blood pressure diagnosed?

Your doctor measures your blood pressure by wrapping an inflatable cuff with a pressure gauge around your arm to squeeze the blood vessels. Then he or she listens to your pulse with a stethoscope while releasing air from the cuff. The gauge measures the pressure in the blood vessels when the heart beats (systolic) and when it rests (diastolic).

How is it treated?

If you have high blood pressure, your doctor may prescribe medication to treat it. Lifestyle changes, such as the ones listed above, can be just as important as taking medicines. Talk with your doctor about the best ways to reduce your risk for high blood pressure.



¹ CDC: Deaths: Final Data for 2009. www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf

² CDC: Vital signs: awareness and treatment of uncontrolled hypertension among adults—United States, 2003–2010. www.cdc.gov/mmwr/preview/mmwrhtml/mm6135a3.htm

KNOW THE FACTS ABOUT

High Blood Pressure

What blood pressure levels are healthy?

To determine whether your blood pressure is normal, your doctor examines your systolic and diastolic pressures, which the gauge measures in millimeters of mercury (abbreviated as mmHg).

	Blood Pressure Levels
Normal	systolic: less than 120 mmHg diastolic: less than 80 mmHg
At risk (prehypertension)	systolic: 120–139 mmHg diastolic: 80–89 mmHg
High	systolic: 140 mmHg or higher diastolic: 90 mmHg or higher

Can high blood pressure be prevented?

You can take several steps to maintain normal blood pressure levels:

- Get your blood pressure checked regularly.
- Eat a healthy diet. Tips on reducing saturated fat in your diet are available on the Web site for CDC's Division of Nutrition, Physical Activity, and Obesity. <http://www.cdc.gov/nutrition/everyone/basics/fat/saturatedfat.html>
- Maintain a healthy weight. CDC's Healthy Weight Web site includes information and tools to help you lose weight. <http://www.cdc.gov/healthyweight/index.html>

- Be physically active. Visit CDC's Physical Activity Web site for more information on being active. <http://www.cdc.gov/physicalactivity/index.html>
- Limit alcohol use. See CDC's Alcohol and Public Health Web site for more information. <http://www.cdc.gov/alcohol>
- Don't smoke. CDC's Office on Smoking and Health Web site has information on quitting smoking. <http://www.cdc.gov/tobacco>
- Prevent or manage diabetes. Visit CDC's Diabetes Public Health Resource for more information. <http://www.cdc.gov/diabetes>

For More Information

Learn more about high blood pressure at the following Web sites:

- Centers for Disease Control and Prevention's Division for Heart Disease and Stroke Prevention: <http://www.cdc.gov/dhdsp/index.htm>
- American Heart Association: <http://www.americanheart.org>
- National Heart, Lung, and Blood Institute: <http://www.nhlbi.nih.gov>



KNOW THE FACTS ABOUT

High Cholesterol



What is high cholesterol?

Cholesterol is a waxy, fat-like substance that your body needs. But, when you have too much in your blood, it can build up on the walls of your arteries. This can lead to heart disease and stroke—leading causes of death in the United States.¹

Are you at risk?

About one in every six adult Americans has high cholesterol.² Anyone, including children, can develop it.

Several factors that are beyond your control can increase your risk. These include your age, sex, and heredity. But, there are some risk factors that you can change. Examples include eating an unhealthy diet, being overweight, and not getting enough exercise.

What are the signs and symptoms?

High cholesterol itself does not have symptoms. Many people do not know that their cholesterol level is high. That's why it's important to schedule regular visits with your doctor. Be sure to ask about having your cholesterol tested.

How is high cholesterol diagnosed?

Doctors can do a simple blood test to check your cholesterol. Most adults should get their cholesterol levels checked every five years. If your total cholesterol is 200 mg/dL* or more, or if your HDL (good cholesterol) is less than 40 mg/dL, you will need to have a lipoprotein profile blood test done. Ask your doctor about what may be right for you.

What levels of cholesterol are healthy?

	Desirable Levels
Total cholesterol	Less than 200 mg/dL*
LDL ("bad" cholesterol)	Less than 100 mg/dL
HDL ("good" cholesterol)	40 mg/dL or higher
Triglycerides	Less than 150 mg/dL

* Cholesterol levels are measured in milligrams (mg) of cholesterol per deciliter (dL) of blood.

¹ CDC: Deaths: Final Data for 2008. www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_10.pdf

² CDC: High serum total cholesterol—an indicator for monitoring cholesterol lowering efforts; U.S. adults, 2005–2006. www.cdc.gov/nchs/data/databriefs/db02.pdf



KNOW THE FACTS ABOUT

High Cholesterol

How is it treated?

Lowering high cholesterol levels is important for people at all ages, with and without heart disease. If you have high cholesterol, you will need to eat a healthy diet, exercise regularly, quit smoking, and you may need to take medication.

Can it be prevented?

You can take several steps to maintain a normal cholesterol level:

- Eat a healthy diet. A high amount of saturated fat and cholesterol in food that you eat can increase blood cholesterol. Tips on reducing saturated fat in your diet are available on the Web site for CDC's Division for Nutrition, Physical Activity, and Obesity.
<http://www.cdc.gov/nutrition/everyone/basics/fat/saturatedfat.html>
- Maintain a healthy weight. Being overweight can increase your cholesterol level. Losing weight can help lower your LDL (bad) cholesterol and total cholesterol level, and raise your HDL (good) cholesterol level. CDC's Healthy Weight Web site includes information and tools to help you lose weight.
<http://www.cdc.gov/healthyweight/index.html>

- Exercise regularly. Regular physical activity can help lower LDL (bad) cholesterol and raise HDL (good) cholesterol. You should try to be physically active for 2 hours and 30 minutes (150 minutes) each week. Visit CDC's Physical Activity Web site for more information on being active.
<http://www.cdc.gov/physicalactivity/index.html>
- Don't smoke. CDC's Office on Smoking and Health Web site has information on quitting smoking.
<http://www.cdc.gov/tobacco>

For More Information:

Learn more at the following Web sites.

- Centers for Disease Control and Prevention's Division for Heart Disease and Stroke Prevention:
<http://www.cdc.gov/dhdsp/index.htm>
- American Heart Association:
<http://www.americanheart.org>
- National Heart, Lung, and Blood Institute:
<http://www.nhlbi.nih.gov>
- MedlinePlus:
<http://www.nlm.nih.gov/medlineplus/cholesterol.html>



KNOW THE FACTS ABOUT

Stroke



What is stroke?

Stroke kills almost 130,000 of the 800,000 Americans who die of cardiovascular disease each year—that's 1 in every 19 deaths from all causes.¹

A stroke, sometimes called a brain attack, occurs when a clot blocks the blood supply to the brain or when a blood vessel in the brain bursts. You can greatly reduce your risk for stroke through lifestyle changes and, in some cases, medication.

Are you at risk?

Anyone, including children, can have a stroke. Every year, about 610,000 people in the United States have a new stroke.²

Several factors that are beyond your control can increase your risk for stroke. These include your age, sex, and ethnicity. But there are many unhealthy habits that you can change. Examples include smoking, drinking too much alcohol, and not getting enough exercise.

Having high cholesterol, high blood pressure, or diabetes also can increase your risk for stroke. However, treating these conditions can reduce the risk of stroke. Ask your doctor about preventing or treating these medical conditions.

What are the signs and symptoms?

The five most common signs and symptoms of stroke are:

- Sudden numbness or weakness of the face, arm, or leg.
- Sudden confusion or trouble speaking or understanding others.
- Sudden trouble seeing in one or both eyes.
- Sudden dizziness, trouble walking, or loss of balance or coordination.
- Sudden severe headache with no known cause.

If you think that you or someone you know is having a stroke, call 9-1-1 immediately.



¹ CDC: Deaths: Final Data for 2009. www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf

² Circulation: Heart Disease and Stroke Statistics—2013 Update. <http://circ.ahajournals.org/content/127/1/e6.long>

KNOW THE FACTS ABOUT

Stroke

How is stroke diagnosed?

Your doctor can perform several tests to diagnose stroke, including brain imaging, tests of the brain's electrical activity, and blood flow tests.

Can it be prevented?

You can take several steps to reduce your risk for stroke:

- Eat a healthy diet. Tips on reducing saturated fat in your diet are available on the Web site for CDC's Division of Nutrition, Physical Activity, and Obesity. <http://www.cdc.gov/nutrition/everyone/basics/fat/saturatedfat.html>
- Maintain a healthy weight. CDC's Healthy Weight Web site includes information and tools to help you lose weight. <http://www.cdc.gov/healthyweight/index.html>
- Be physically active. Visit CDC's Physical Activity Web site for more information on being active. <http://www.cdc.gov/physicalactivity/index.html>
- Don't smoke. CDC's Office on Smoking and Health Web site has information on quitting smoking. <http://www.cdc.gov/tobacco>
- Limit alcohol use. See CDC's Alcohol and Public Health Web site for more information. <http://www.cdc.gov/alcohol>

- Prevent or treat your other health conditions, especially high blood pressure, high cholesterol, and diabetes. Visit CDC's pages on these conditions to learn more.

<http://www.cdc.gov/bloodpressure>

<http://www.cdc.gov/cholesterol>

<http://www.cdc.gov/diabetes>

How is it treated?

If you have a stroke, you may receive emergency care, treatment to prevent another stroke, rehabilitation to help you relearn the skills you may have lost because of the stroke, or all three. In addition, lifestyle changes, such as the ones listed above, can help lower your risk for future strokes. Talk with your doctor about the best ways to reduce your stroke risk.

For More Information

Learn more about stroke at the following Web sites:

- Centers for Disease Control and Prevention's Division for Heart Disease and Stroke Prevention:
<http://www.cdc.gov/dhdsp/index.htm>
- American Stroke Association:
<http://www.strokeassociation.org>
- National Institute of Neurological Disorders and Stroke:
<http://www.ninds.nih.gov>



KNOW THE FACTS ABOUT

Heart Disease



What is heart disease?

Heart disease is the leading cause of death in the United States. More than 600,000 Americans die of heart disease each year. That's one in every four deaths in this country.¹

The term "heart disease" refers to several types of heart conditions. The most common type is coronary artery disease, which can cause heart attack. Other kinds of heart disease may involve the valves in the heart, or the heart may not pump well and cause heart failure. Some people are born with heart disease.

Are you at risk?

Anyone, including children, can develop heart disease. It occurs when a substance called plaque builds up in your arteries. When this happens, your arteries can narrow over time, reducing blood flow to the heart.

Smoking, eating an unhealthy diet, and not getting enough exercise all increase your risk for having heart disease.

Having high cholesterol, high blood pressure, or diabetes also can increase your risk for heart disease. Ask your doctor about preventing or treating these medical conditions.

What are the signs and symptoms?

The symptoms vary depending on the type of heart disease. For many people, chest discomfort or a heart attack is the first sign.

Someone having a heart attack may experience several symptoms, including:

- Chest pain or discomfort that doesn't go away after a few minutes.
- Pain or discomfort in the jaw, neck, or back.
- Weakness, light-headedness, nausea (feeling sick to your stomach), or a cold sweat.
- Pain or discomfort in the arms or shoulder.
- Shortness of breath.

If you think that you or someone you know is having a heart attack, call 9-1-1 immediately.



¹ CDC: Deaths: Final Data for 2009. www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf

KNOW THE FACTS ABOUT

Heart Disease

How is heart disease diagnosed?

Your doctor can perform several tests to diagnose heart disease, including chest X-rays, coronary angiograms, electrocardiograms (ECG or EKG), and exercise stress tests. Ask your doctor about what tests may be right for you.

Can it be prevented?

You can take several steps to reduce your risk for heart disease:

- Don't smoke. CDC's Office on Smoking and Health Web site has information on quitting smoking.

<http://www.cdc.gov/tobacco>

- Maintain a healthy weight. CDC's Healthy Weight Web site includes information and tools to help you lose weight.

<http://www.cdc.gov/healthyweight/index.html>

- Eat a healthy diet. Tips on reducing saturated fat in your diet are available on the Web site for CDC's Division for Nutrition, Physical Activity, and Obesity.

<http://www.cdc.gov/nutrition/everyone/basics/fat/saturatedfat.html>

- Exercise regularly. Visit CDC's Physical Activity Web site for more information on being active.

<http://www.cdc.gov/physicalactivity/index.html>

- Prevent or treat your other health conditions, especially high blood pressure, high cholesterol, and diabetes.

How is it treated?

If you have heart disease, lifestyle changes, like those just listed, can help lower your risk for complications. Your doctor also may prescribe medication to treat the disease. Talk with your doctor about the best ways to reduce your heart disease risk.

For More Information:

Learn more at the following Web sites.

- Centers for Disease Control and Prevention's Division for Heart Disease and Stroke Prevention:

<http://www.cdc.gov/dhds/index.htm>

- Centers for Disease Control and Prevention's National Center on Birth Defects & Developmental Disabilities:

<http://www.cdc.gov/ncbddd/birthdefects/default.htm>

- American Heart Association:

<http://www.americanheart.org>

- National Heart, Lung, and Blood Institute:

<http://www.nhlbi.nih.gov>



From 70 to 80 Percent

The Hypertension Management Toolkit



From 70 to 80 Percent

The Hypertension Management Toolkit

Acknowledgements

Co-Authors

Robin Edelman, MS, RD, CDE
Vermont Department of Health

Jennifer Gordon, MSW
The New England Quality Innovation Network -
Quality Improvement Organization

Contributors and Editors

Emily Bartling, RN, BSN, CCM, CPHQ
OneCare Vermont

Virginia Hood, MBBS, MPH
Larner College of Medicine, University of Vermont

Alexandra Jasinowski, BS
Vermont Blueprint for Health

Suzanne Lapointe, RN
University of Vermont Medical Center

Patricia Launer, RN, CPHQ
Community Health Accountable Care, LLC

Nicole Lukas, MA
Vermont Department of Health

Charles Maclean, MD
Larner College of Medicine, University of Vermont

Kristi Poehlmann, RN
Cathedral Square Corporation, Support and Services at Home

Jenney Samuelson, CHES
Vermont Blueprint for Health

Connie van Eeghen, DrPH, MHSA, MBA
Larner College of Medicine, University of Vermont

Introduction



Why another resource for identifying and managing hypertension?

Because hypertension is the most significant cardiac risk factor in older adults,¹ and Vermont data show that it may be under-identified and not as well controlled as possible.

Research demonstrates that lowering blood pressure by 10 mm Hg in patients with hypertension reduces cardiovascular and stroke mortality by 25% and 40%, respectively.²

While data are limited for controlled blood pressure among those with a hypertension diagnosis, what is reported by Vermont practices shows blood pressure control at approximately 70%. This leaves room for improvement. Increasing the rate of blood pressure control to 80% is a realistic target, given the available evidence-based treatment protocols and accompanying resources. Standardizing implementation across Vermont may prevent misdiagnosis, under- and over-treatment of hypertension, and improve the accuracy of blood pressure measurement across the health care system.

While a 70 percent success rate might sound good to a practice, it's unacceptable from the patient's standpoint. A practice may be interested in how well it's doing for its entire patient population while a patient wants to know how well the practice is doing by him or her. As Roger Resar, MD, a Senior Fellow at the

Institute for Healthcare Improvement says, "For the individual patient, reliability is an all-or-none matter. If the right care has five elements and the health care team accomplishes all five only 70 percent of the time, that's 100 percent failure for each of the 30 percent of patients who don't get all the recommended care. There is no partial credit for reliability." How do we improve reliability? We must rely on evidence-based protocols that are widely agreed-upon, like the JNC 7 and 8 guidelines for hypertension treatment.

This toolkit will be updated annually and may be downloaded for free. An online education module with an option to earn CME/CEU is available to facilitate implementation of a hypertension control project in your practice.

Join fellow clinicians in taking the '70 to 80 percent challenge' to improve hypertension management, increase rates of population blood pressure control, and decrease morbidity and mortality due to hypertension.

Introduction References

1. James PA, Oparil S, Carter BL, et al. 2014 Evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed the Eighth Joint National Committee (JNC 8) [published correction appears in JAMA. 2014;311(17):1809]. JAMA. 2014;311(5):507–520.
2. Law MR, Morris JK, Wald NJ. Use of blood pressure lowering drugs in the prevention of cardiovascular disease: a meta-analysis of 147 randomized trials in the context of expectations from prospective epidemiological studies. BMJ. 2009;338:b1665.

Contents

Introduction_____i

Why another resource for identifying and managing hypertension?_____i

Part 1: The Data_____1

Hypertension Prevalence_____1

Benchmarks for Blood Pressure Identification/Control_____2

Controversy in Determining Blood Pressure Targets_____3

Part 2: How To Use the Toolkit_____5

► Fast Track_____5

Stage 1: Engage and Prepare_____6

Stage 2: Design_____6

Stage 3: Implement_____6

Part 3: Quality Improvement_____7

Stage 1: Engage and Prepare_____7

Step 1.1 Conduct a practice readiness assessment_____8

Step 1.2 Understand the A3_____9

Step 1.3 Identify your baseline and shared objectives_____10

Step 1.4 Build the team_____14

Step 1.5 Schedule effective meetings_____14

Stage 2: Design_____15

Step 2.1 Team start up_____16

Step 2.2 Analyze the workflow_____16

Step 2.3 Identify contributing factors_____18

►► Step 2.4 Review and select strategies_____19

►► Step 2.5 Design the new workflow_____46

►► Step 2.6 Draft Implementation Plan_____47

Step 2.7 Check in with practice leaders_____48

Stage 3: Implement_____49

Step 3.1 Implementation Plan and Measures_____50

Step 3.2 Evaluation and Closure_____51

Part 4: Pay for Performance Quality Programs_____52

zMerit-Based Incentive Payment System (MIPS)_____52

Shared Savings Programs_____54

Appendices 56

A: Practice Readiness Assessment	57
B: A3 Template	59
C: NQF 18 Measure Specification	62
D: Team Member Template	69
E: Sample Agendas for Team Meetings	70
F: AMA Process Map Toolkit	78
G: Cause and Effect Diagram	83
H: Hypertension Order Set Checklist	85
I: Vendor Engagement Strategies	86
J: Workflow Background and Knowledge Area Primer	87
K: Data Element Capture Template	89
L: CDS Intervention Rating Scale	92
M:AMA Tips for Accurate Blood Pressure Reading	94
N: Blood Pressure Log Template	95
O: Sample Blood Pressure Log	96
P: Implementation Plan Template	97
Q: Implementation Plan Sample	98

The Data



Hypertension Prevalence

Eighty million adults (one in three) have high blood pressure in the United States today; prevalence increases with age.

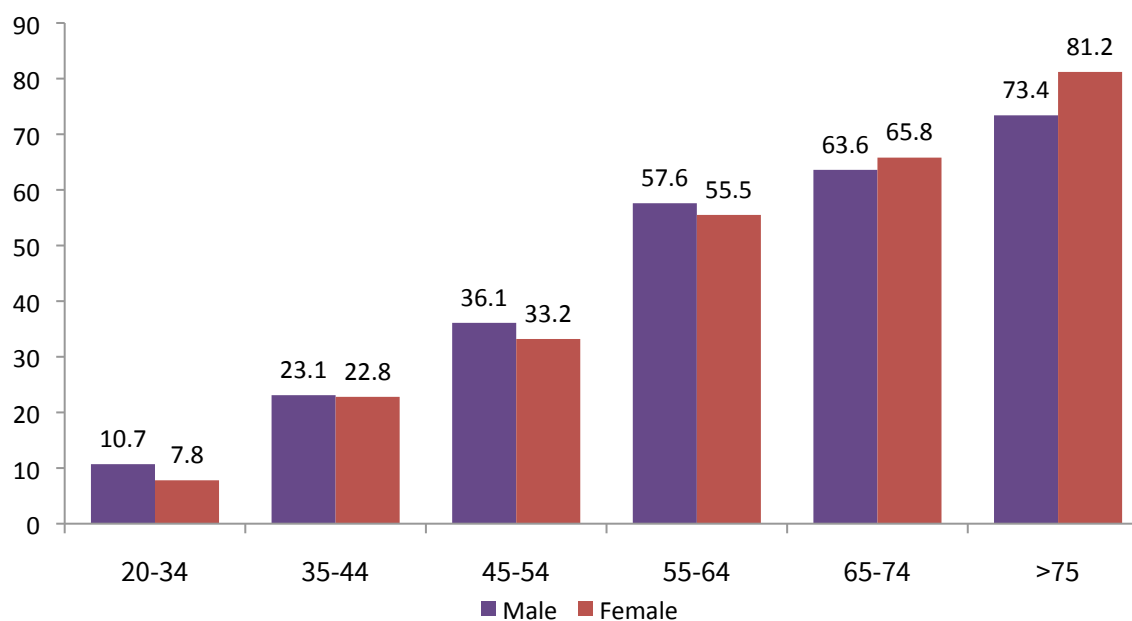


FIGURE 1: PREVALENCE OF HYPERTENSION

Source) TARGET:BP, Heart Disease and Stroke Statistics – 2017 Update: Chapter 9; American Heart Association, American Medical Association



Benchmarks for Blood Pressure Identification/Control

Data regarding the statewide prevalence of both diagnosed and undiagnosed hypertension is lacking in Vermont, however, the telephonic survey Behavioral Risk Factor Surveillance system (BRFSS), indicates that 25% of Vermonters are aware that they have hypertension.¹

From 2011 to 2014, the nationwide prevalence for adults overall (age 18 plus) diagnosed with hypertension was 29% and that of adults age 60 and over was 65%.² These national values for overall adult and older adult prevalence can serve as benchmarks for adequate diagnosis of hypertension in primary care practices. In 2014 staff from the Centers for Disease Control and Prevention authored an editorial in JAMA noting that among the US population with uncontrolled blood pressure 36% (approximately 13 million people) are neither aware of their hypertension, nor taking antihypertensive medications. These authors appeal to healthcare providers to find patients with undiagnosed hypertension, “hiding in plain sight”.³

In comparing these numbers to the reported 25% of Vermonters who are aware of their hypertension, one can infer that it may be under-identified in Vermont. Up to 20% of Vermont adults 18 and older (approx. 72,000 adults) may have hypertension and not know it.⁴

What is the prevalence of hypertension in your practice?

Vermont primary care practices can query their electronic medical records to assess the prevalence of diagnosed hypertension for all adults and for those 60 and over, and compare with the national benchmarks. Calculate:

Adult patients with a diagnosis of essential hypertension ÷ **Adult patients** x **100**

Compare to national benchmarks of 29% (all adults) and 65% (adults 60 and over).

National data indicate that only about half the people with hypertension have blood pressure that is controlled to a target of <140/90.⁵ Vermont aggregate data for controlled blood pressure in those with diagnosed hypertension are available from a variety of sources. While there may be differences in the exact methods used to determine the population under study, these estimates provide useful information about hypertension control in our region.

- » **The Vermont Blueprint for Health** uses an All-Payer database to track quality and utilization metrics, such as blood pressure control for patients with hypertension (NQF 18). These data are collected on Patient-centered Medical Homes that are connected to a clinical registry. Blueprint reports blood pressure control as 71% (N=29,630).⁶
- » **OneCare Vermont**, an Accountable Care Organization (ACO), collects quality measure data on an annual basis for attributed lives in the Medicare, Medicaid, and Commercial populations. The 2015 performance rate for controlling hypertension in 2015 for Medicare was 71.21% (N=8,568), Medicaid 67.9% (N=2,197), and Commercial 70.7% (N=2,797).⁷
- » **The 2015 Uniform Data System** reported on Vermont’s individual federally qualified health centers with ranges from 52.9% to 75.3% (9 of the 11 sites reporting less than 70%).⁸



Cheshire Medical Center/Dartmouth-Hitchcock Keene, a Million Hearts Champion, serving a hypertensive population of 12,000 reported 72% in 2012 and raised their “in control” rate to 85% within a year.⁹

- » **UVM Medical Center Primary Care** practices report that among patients 18-85 years with hypertension, 66% were at a target of <140/90 (N=16,137).

How well controlled is hypertension in your practice?

Vermont primary care practices can query their electronic medical records to assess their percent “in control.” Age cut-offs and exclusions will vary based on specific instructions for unique performance measures, but generally the measurement is:

$$\frac{\text{adult patients with last measured systolic BP <140 and diastolic BP <90}}{\text{adult patients with a diagnosis of essential hypertension}} \times 100$$

Controversy in Determining Blood Pressure Targets

In the past few years experts have supported differing blood pressure targets. In 2014 the JNC8 guideline recommended a higher blood pressure target for patients 60 and older (150 systolic versus 140 systolic) than was recommended under JNC7.¹⁰ On the other hand the SPRINT trial examined the benefits of reducing systolic blood pressure to about 130 systolic among older patients with at least one other risk factor but without diabetes. The results of this trial are still being debated, and showed mortality benefits, but also an increase in adverse effects.¹¹

This Hypertension Management Toolkit is committed to provide links to updates regarding publications addressing this controversy. As the toolkit went to press in 2017 guidelines jointly published by the American College of Physicians and the American Academy of Family Physicians recommended that clinicians consider intensifying pharmacologic treatment in adults aged 60 years or older with select conditions or risks such as history of stroke or transient ischemic attacks to achieve a target systolic blood pressure of less than 140 to reduce the risk of stroke or cardiac events. The 2017 March/April issue of the Annals of Family Medicine provides additional guidelines.¹²

Part 1 References

1. Vermont BRFSS 2015
2. Data Brief No. 220, November 2015. Sung Sug (Sarah) Yoon, Ph.D, R.N.; Cheryl D. Fryar, M.S.P.H.; and Margaret D. Carroll, M.S.P.H.
3. Wall HK et al. Patients with undiagnosed Hypertension, hiding in plain sight. JAMA 2014; 312(19): 1973-1974.
4. Vermont Department of Health. 1305 Surveillance: State Public Health Actions to Prevent and Control Diabetes, Heart Disease, Obesity, and Associated Risk Factors and Promote School Health – Data Pages. http://healthvermont.org/sites/default/files/documents/2016/12/HS_1305_Data_Pages_081816.pdf. August 18, 2016.
5. Nwankwo T. et al. Hypertension among adults in the United States: National Health and Nutrition Examination Survey, 2011-2012. <http://www.cdc.gov/nchs/data/databriefs/db133.pdf>
6. Blueprint statewide Profile Accountable Care Organization Measures Detail, July 2014 - June 2015.
7. <https://www.onecarevt.org/docs/2015%20Quality%20Performance%20Results%20Table.pdf>
8. <http://bphc.hrsa.gov/uds/datacenter.aspx?q=d&year=2015&state=VT#glist>
9. Ten Steps for Improving Blood Pressure Control in New Hampshire: <http://www.dhhs.nh.gov/dphs/cdpc/documents/tensteps-bpcontrol.pdf>
10. JNC 8 Guidelines for the management of Hypertension in adults. 2014 <http://www.aafp.org/aafp/2014/1001/p503.pdf>
11. Wright, J. T., Jr., Williamson, J. D., et al. (2015). "A Randomized Trial of Intensive versus Standard Blood-Pressure Control." N Engl J Med 373(22): 2103-16.
12. Pharmacologic Treatment of Hypertension in Adults Aged 60 Years or Older to Higher Versus Lower Blood Pressure Targets: A Clinical Practice Guideline From the American College of Physicians and the American Academy of Family Physicians <http://annals.org/aim/article/2598413/pharmacologic-treatment-Hypertension-adults-aged-60-years-older-higher-versus>

How To Use the Toolkit



This toolkit is intended for ambulatory care practices whose leaders, clinicians, and staff want to improve the process of managing Hypertension for their patients. It combines two approaches which may improve the quality of care you provide to patients with Hypertension, while also improving your business processes.

The first approach focuses on introducing Lean quality improvement methods into the practice. “Lean” is both a mindset and a method to engage clinicians and staff in organizing their practice to run more smoothly. The focus of Lean is to eliminate waste, improve efficiency, and most importantly, add value for the patient by improving processes. Benefits include: increased patient and staff satisfaction, waste elimination, process standardization, and innovation at the point of care. The workflow redesign steps identified in this toolkit are based on the Lean methodology of quality improvement.

The second approach is to develop a population health management methodology in your practice. Population health management equips healthcare teams with the techniques to monitor their patient populations to provide necessary preventive and chronic care to all patients, regardless of the frequency of visits. The two primary reasons for implementing

population health management are: 1) addressing chronic and preventive care has been shown to improve the health of patients, and 2) shifting to outcome focused care will prepare practices for the expected future of value-driven payment models, in which reimbursement is at least partially dependent on population health outcomes.

This toolkit provides a detailed description of each step to facilitate a quality improvement project and is targeted for use by project managers and practice facilitators within the practice organization or who are external consultants.



Fast Track

If you are interested in using a streamlined version of the toolkit, follow the Practice Fast Track. The Practice Fast Track is intended for those who have already conducted the initial steps of the Hypertension Management Toolkit and are interested in experimenting with strategies relatively quickly.

The Fast Track steps are in Stage 2: Design, and are shown in green with a fast track icon.

The toolkit is made up of three stages that can be used sequentially or in the order that is most effective for the practice. The diagram below identifies the modules in each stage for navigation to the desired starting point.

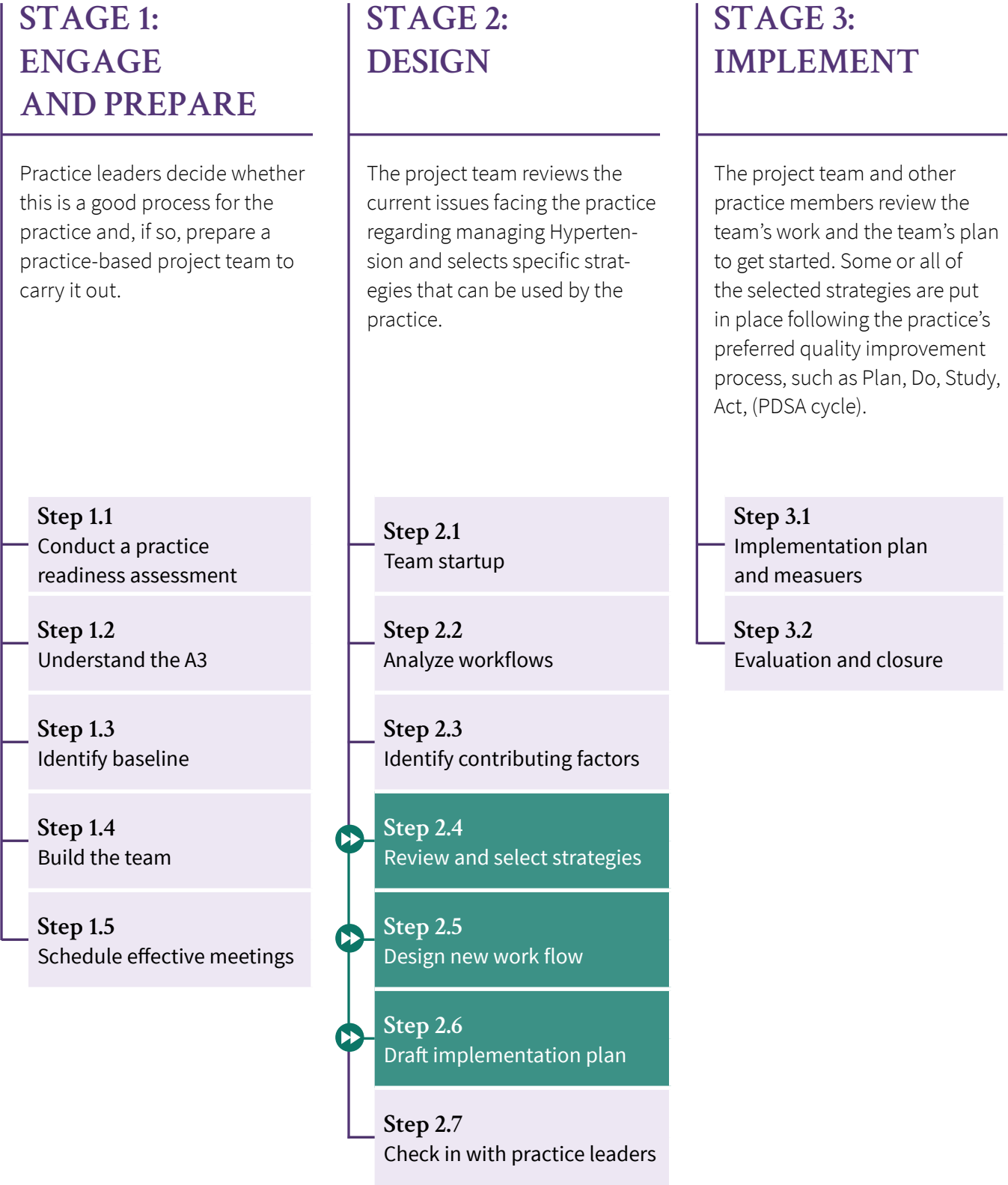


FIGURE 2: TOOLKIT STEPS

Quality Improvement



STAGE 1: ENGAGE AND PREPARE

Practice leaders decide whether this toolkit is a good choice for the practice. If it is, they prepare a practice team to carry it out.



Estimated time to complete:
4 hours of practice leader's time

The five steps in this stage are listed below, with more detail on following pages.

Steps:

- 1.1 **Conduct a practice readiness assessment**
- 1.2 **Understand the A3**
- 1.3 **Identify your baseline and shared objectives**
- 1.4 **Build the team**
- 1.5 **Schedule effective meetings**

Step 1.1

Conduct a practice readiness assessment



Time: One hour

Changing the way a practice manages hypertensive patients may lead to an increase in work demand and can therefore be challenging for the healthcare team. Before starting such a project, practice leaders should evaluate whether this project is a good fit at this time.

The hypertension [Practice Readiness Assessment \(Appendix A\)](#) can be used to collect anonymous feedback from a sample of practice members to guide this decision. Document conclusions for a later project team and to educate clinicians to engage their support.

Is there low readiness?

Try the following with your practice members:

1. Identify the areas in which there are barriers
2. Motivate with practice-specific data
3. Educate on the importance of improving management of hypertension
4. Re-assess in four months



Task 1. Identify practice clinicians and staff from different roles among clinical and non-clinical staff to complete the [Practice Readiness Assessment \(Appendix A\)](#). If the practice has eight or fewer members, distribute to everyone.

Task 2. Distribute the assessment, with instructions about the date it should be returned and where it should be sent.

Task 3. Look for two or more ratings of “1” or “2,” then consider, as practice leaders, whether this is an indication that the project should be done at this time or needs additional preparation before starting. Explanation:

- Items 1 to 4 relate to perceptions about whether the process of caring for hypertensive patients needs to change.
- Items 5 to 7 ask about the method of change.
- Item 8 asks about managing change.
- Items 9 and 10 is about motivation to change.

Task 4. Review all comments for additional indications of whether the practice is ready to conduct this project at this time. When ready to proceed, continue to Step 1.2.

Step 1.2

Understand the A3



Time: One hour

“A3” is the name of a structured problem-solving method and communication tool that will help to facilitate the practice’s design team for hypertension management. As the team completes the steps in this toolkit, the practice will look at each of these elements. With each element, you will see where it fits on the [A3 Template \(Appendix B\)](#). At the end, the A3 Template will be completed and may be used as a working document.

1. Look at the situation as it exists right now. This is called “the Current State.”
AND
2. Propose actions to bring about a new version of that situation sometime soon. This is called “the Future State.”

This structure of A3 has a basic rule: use the A3 sheet of paper (11” x 17”) in landscape format (the 17” side is the horizontal side) and divide it vertically into two equal halves by folding it into a booklet. When the booklet is open (lying flat), write everything to do with the Current State on the left side of the paper. And, write everything to do with the Future State on the right hand side. Remember: always refer to the team that is planning how the practice will improve its hypertension care.

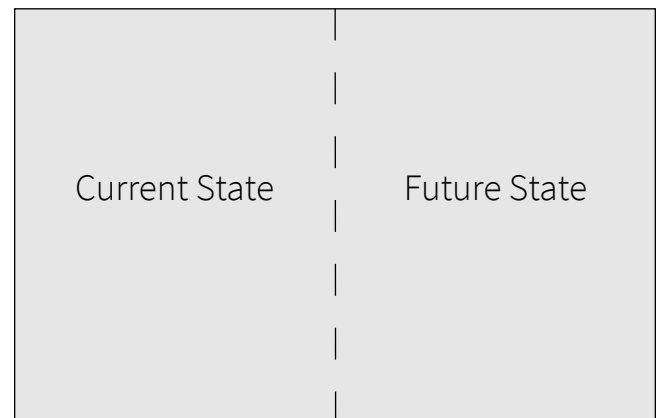



FIGURE 3: A3 FRAMEWORK

Step 1.2 References

1. Jimmerson C, Weber D, Sobek DK, 2nd. Reducing waste and errors: piloting lean principles at Intermountain Healthcare. Joint Commission journal on quality and patient safety / Joint Commission Resources. 2005;31(5):249-257.
2. Endsley, Magill, & Godfrey, 2006; Healthcare Performance Partners, 2007; Jimmerson, Weber, & Sobek, 2005; Liker & Franz, 2012)
3. Endsley, S., Magill, M. K., & Godfrey, M. M. (2006). Creating a lean practice. Family practice management, 13(4), 34-38.
4. Healthcare Performance Partners, A. M. C. (2007). A3 Reports. Retrieved from <http://leanhealthcareperformance.com/lean/a3.php>
5. Liker, J. K., & Franz, J. K. (2012). THE TOYOTA WAY: Helping Others Help Themselves. Manufacturing Engineering, 149(5), 7.

Step 1.3

Identify your baseline and shared objectives

 Time: One hour, if the electronic health record has this information in captured fields.

Most quality measure programs use National Quality Forum (NQF) measure #18, which is described in the table below. For more detailed information see [NQF 18 Measure Specification \(Appendix C\)](#).

TABLE 1: NATIONAL QUALITY FORUM (NQF) MEASURE #18 ¹	
Description	The percentage of patients 18 to 85 years of age who had a diagnosis of hypertension and whose blood pressure (BP) was adequately controlled (<140/90) during the measurement year.
Numerator	The number of patients in the denominator whose most recent BP is adequately controlled during the measurement year. For a patient’s BP to be controlled, both the systolic and diastolic BP must be <140/90 (adequate control). To determine if a patient’s BP is adequately controlled, the representative BP must be identified.
Denominator	Patients 18 to 85 years of age by the end of the measurement year who had at least one outpatient encounter with a diagnosis of hypertension during the first six months of the measurement year.
Exclusions	Pregnant women, patients with End-Stage Renal Disease (ESRD) and patients who had an admission to a nonacute inpatient setting during the measurement year.

Task 1: Search your electronic health record for patients that meet certain criteria. If your organization is already reporting on hypertension quality of care for a registry or accrediting bodies, internal reports may already be available.

Include the data that are most relevant to your aims and target metrics. Below are suggested criteria, captured in coding or discrete fields of an EHR. The items in bold are must captures.

- **Age 18 to 85**
- **Gender**
- **BMI (height & weight)**
- **ICD-10-CM diagnosis for hypertension**
- **Last recorded blood pressure <140/90**
- Patient encounter during performance period (CPT or HCPCS): 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99341, 99342, 99343, 99345, 99347, 99348, 99349, 99350, G0402, G0438, G0439
- Medication class and generic name equivalent, dose and frequency of antihypertensive, lipid-lowering, and diabetes medications
- Presence of hypercholesterolemia, hyperlipidemia, diabetes mellitus Type 1 and Type 2
- Presence of concomitant cardiovascular risk factors and diseases.
For example; smoking, menopausal status, nephropathy, congestive heart failure, hypercholesterolemia, and family history of cardiovascular disease.
May be captured in problem list
- Lab data: serum potassium, serum creatinine (estimated glomerular filtration rate [eGFR]), LDL cholesterol (mg/dL), A1C, urine albumin/creatinine, CBC

Task 2: How does your practice compare to local and national benchmarks?
Enter your practice's data into the appropriate cells and review the information in the table below to see how you compare.

TABLE 2: NATIONAL QUALITY FORUM (NQF) MEASURE #18

Organization	Metric	Age			
		18–85	18–39	40–59	60 plus
National Health & Nutrition Examination Survey (NHANES) 2011 – 2014 ²	Controlled hypertension = SBP <140 mm Hg and DBP <90 mm Hg among persons with hypertension	53%	37.4%	57.2%	52.5%
Federally Qualified Health Centers in VT, 2015 ³	Hypertensive Patients with Blood Pressure < 140/90	65% (mean of 11 FQHCs)	N/A	N/A	N/A
OneCare VT 2015 ⁴	Controlled hypertension = BP <140/90 in patients with hypertension diagnosed aged 18-85	69.9% (N=13,562)	85%	70.9%	68.8%
Blueprint for Health Practice Profile database 2014-2015 ⁵	Controlled hypertension = SBP <140 mm Hg and DBP <90 mm Hg among persons with hypertension	71% (N=29,630)	N/A	N/A	N/A
Your Practice Data Here	Controlled hypertension = SBP <140 mm Hg and DBP <90 mm Hg among persons with HYPERTENSION				

Table 3 below shows the [Merit-Based Incentive Payment System](#) (MIPS) benchmark results being used in the Quality Payment Program to determine payment incentives for performance year 2017. The national benchmarks are based on actual performance data submitted via a registry to PQRS in 2015.

TABLE 3: BENCHMARK DECILES FOR MIPS PERFORMANCE YEAR 2017

Decile	3	4	5	6	7	8	9	10
NQF 18 Hypertension (HTN):	59.10 –	61.03 –	63.27 –	64.75 –	67.05 –	68.87 –	71.93 –	> =
Controlling Blood Pressure ⁶	61.02	63.26	64.74	67.04	68.86	71.92	75.11	75.12

Task 3: Identify your shared objective. Evaluating what others achieved provides appropriate context for choosing the numerical portion of an organization’s aim. While the goal of 100 percent of hypertensive patients achieving a blood pressure of less than 140/90 is optimal, an organization can set an appropriate and realistic goal based on the data provided in the tables above, after consideration of a number of factors, including progress to date with the indicator and funding agency expectations. The numerical part of the aim should be obtainable, yet high enough to challenge the team to substantially and meaningfully improve.

Task 4: Now that the practice has baseline data and a shared objective, add this information to the Background Section of the A3.

Notes:

- Use the Million Hearts Estimator tool: <https://nccd.cdc.gov/MillionHearts/Estimator/>
- Quality and Resource Use Reports (QRUR) provides national bench-marking data for Medicare patients: <https://www.cms.gov/medicare/medicare-fee-for-service-payment/physicianfeedbackprogram/obtain-2013-qrur.html>

Step 1.3 References:

1. <http://www.qualityforum.org/QPS/QPSTool.aspx>
2. <https://www.cdc.gov/nchs/data/databriefs/db220.htm>
3. <https://www.cdc.gov/nchs/products/databriefs/db278.htm>
4. OneCare Vermont Annual Quality Measure Collection Result 2015
5. Blueprint statewide Profile Accountable Care Organization Measures Detail, July 2014 - June 2015.
6. <https://qpp.cms.gov/resources/education>

Step 1.4

Build the team



Time: One hour

The people you choose for your team should embody the first two elements and the third should be supported by leadership. The practice may have a pre-existing team that focuses on quality improvement, in which case, confirm that this is the right mix of people

to address hypertension management. Identify three to seven people who will be on your QI team for this project. You may not fill every position, depending on the nature of your hypertension project.

There are three essential elements of a team that increase the likelihood of a successful change project.

- Commitment of both practice leadership and staff
- A culture that views quality improvement as a way to provide better care to their patients, not just another revenue stream for the practice or a bothersome bureaucratic burden
- Resources which may introduce some upfront costs, but will pay off in the end

Task 1: Complete the [Team Member Template \(Appendix D\)](#). Now that the practice has baseline data, add this information to the Team Section of the A3.

Step 1.5

Schedule effective meetings

Now that you've identified your team members, schedule effective team meetings by adhering to these four tasks:

Task 1: Create a schedule of team meetings for ten hours of team work with each meeting being at least one hour in length and no more than one week apart.

Task 2: Rotate meeting roles.

Task 3: Solve problems as a group.

Task 4: Record action steps, owners and due dates. Refer to the [Sample Agendas for Team Meetings \(Appendix E\)](#) that can be modified as needed. Now that the practice has chosen the core team members, add this information to the Team Section of the A3.

STAGE 2: DESIGN

The project team reviews the current issues facing the practice regarding hypertension management and selects specific strategies that will be used by the practice as a whole. Each of the steps for the team is described, with examples where appropriate.



Estimated time to complete:
7-9 hours of team meeting time

The seven steps in this stage are listed below, with more detail on following pages.

Steps:

- 2.1 Team start up and review of A3
- 2.2 Analyze work flow
- 2.3 Identify contributing factors
- ▶▶ 2.4 Review and select strategies
- ▶▶ 2.5 Design new work flow
- ▶▶ 2.6 Draft implementation plan
- 2.7 Check in with practice leaders

Step 2.1

Team start up



Time: One hour

Convene the team and complete the following tasks:

Task 1: Review the project objective

Task 2: Review and refine the [A3 Template \(Appendix B\)](#).

Task 3: Review the results of the [Practice Readiness Assessment \(Appendix A\)](#).

Task 4: Discuss any questions or issues that arise.

Task 5: Agree on when and how the project team should communicate progress or challenges with the practice leaders.

Task 6: Practice leaders turn the team over to the team leader.

Step 2.2

Analyze the workflow



Time: One hour

A process map is used in analyzing, designing, documenting, or managing a process or program and will allow the team to better understand how blood pressure is measured and treated in the practice. A process map provides a close-up view of the steps of a process using simple symbols. It can clarify complex processes and identify steps that do not add value to the practice or patient, including delays, equipment problems, unnecessary work, duplication, added expense, and breakdowns in communication.

Remember that most problems are a result of poor process, not bad people, so be careful to not assign blame.

To create your workflow, use the [AMA Process Map Toolkit \(Appendix F\)](#) from the American Medical Association. Pay particular attention to the symbols and what each represents. Refer to the following example workflow.

Task 1: Describe the current process for caring for a patient with hypertension. Make a list of each step in the process grouping together all tasks done by one job function (receptionist, medical assistant, nurse, provider, etc.). Describe clearly the tasks involved in each process step, including what happens with the patient's information, so everyone shares a complete understanding.

Include all actions that are completed with your EHR related to documenting, reviewing, notifying, performing ordering or creating.

See the process from the patient's perspective and map the step-by-step activities to visually represent the path taken by a typical patient and the care team, from arrival at the office or telephone call to medication choices, referrals, and follow-up care. Be sure to include any steps that are outside of the visit, including calls to the patient.

The resulting diagram will assist the team in visualizing the order of patient flow and perhaps also in discovering flaws, bottlenecks, or gaps in care.

Task 2: Now go back to each process step in the workflow, and estimate the percentage of time that the person doing each process has all the resources and information needed at the start of that process, completely and accurately. It answers the question, "If 100 people came through the office for a HTN follow up visit in one day, for how many is their information complete and accurate so the healthcare team can be present at every step? Label this "% Complete & Accurate" (%CA) and enter it under each step.

To calculate the total, multiply all %CA into one product. This product is the approximate measure of the practice's effectiveness in providing all the patient care resources needed to complete this particular care process accurately.

Task 3: Once you have completed the workflow template, take a step back and observe each step. Have each team member answer the questions below.

1. What is working well in this process that we want to preserve?
2. Does the step create value for the patient or are some parts of it wasteful of time and energy?
3. Does the step produce good results every time or does it sometimes fail?
4. Are all resources and information available whenever it is needed to do the work or is it sometimes unavailable, broken or delayed?
5. Is the step immediately completed in the flow of work or does it result in a bottleneck?
6. Can it adapt easily to fluctuations or is it inflexible?

Identify the opportunities for improvement and write them on the flow chart. Record this on the A3 template.

Step 2.3

Identify contributing factors



Time: One hour

Through the analysis of the workflow in the previous step, the team members have identified problems in the way the patient care process currently works. The team brainstorms general or specific reasons for those problems. Cause and effect diagrams, sometimes called fishbone diagrams, can help in brainstorming to identify possible causes of a problem and in sorting ideas into useful categories. The problem or effect is displayed at the head or mouth of the fish. Possible contributing causes are listed on the smaller bones under various cause categories.

Be sure to include each step that has a less than 90% Complete and Accurate (CA) and brainstorm reasons why this is the case.

Complete the [Cause and Effect Diagram \(Appendix G\)](#).

Once you have completed the Cause and Effect diagram ask each team member to identify the top three to five root causes of the identified problem.

Compare the top three to five root causes with the strategies in the table and identify the strategy that will resolve the problem/s and that the practice will try first. Alternatively, identify a strategy that is not listed in the table, but that the practice has identified, that would solve the problem.



Step 2.4

Review and select strategies



Time: One hour, not including implementation.

Review and select strategies based on importance to the practice, simplicity, and problem resolution. These strategies are optional and independent of each other. Select at least one. Team members review the following list of strategies, described in more detail on the following pages.

The table on the following pages summarizes ten strategies in the toolkit.

They are categorized into four domains, adapted from www.ihi.org/resources/Pages/Changes/ChangestoImproveChronicCare.aspx.

The four domains are:

- **Decision Support** - Treatment decisions should be based on explicit, proven guidelines that are supported by a defining study and the guidelines are integrated into the day-to-day practice in an accessible and easy-to-use manner.
- **Clinical Information System** - A registry that can track individual patients and populations of patients, is a necessity when managing chronic illness or preventive care. For the registry to be reliable, documentation needs to be standardized.
- **Delivery System Design** - Delivery of patient care requires determination of what care is needed, and a clarification of roles and tasks to ensure the patient receives the right care at the right time. The healthcare team must have centralized, current information about the patient's status, and make follow-up a part of their standard procedures.
- **Effective self-management** - Engaged patients who have a central role in determining their care fosters a sense of responsibility for their own health and well-being.

TABLE 4: STRATEGIES

Strategy	Description	Rationale	Domain
1. Use a consistent approach across practice and monitor adherence to the clinical practice guidelines.	Healthcare team members agree on clinical practice guidelines for hypertension management that all can support and implement.	Team buy-in is essential to developing a continuously improving system.	Decision Support
2. Use the electronic health record to create and maintain a registry. Use the registry to reach out to patients to provide continuity of care.	Hypertensive patients are entered onto a registry. A designated person is identified who is responsible for maintaining the registry.	Registry functionality is needed in order to produce population health summaries and identify patients who are at risk because of being out of range.	Clinical Information System
3. Implement a pre-visit planning process.	Healthcare team members develop a pre-visit planning process, document the workflow, and monitor adherence to the process.	Pre-visit planning is an important element to managing hypertensive patients in order to maximize the office visit with the healthcare team.	Delivery System Design
4. Document in a systematic and standardized method in the EHR.	Healthcare team members document in a systematic and standardized method in the EHR.	Provides information for quality patient care and quality initiatives. It ensures regulatory, coding and billing requirements are met.	Clinical Information System
5. Integrate clinical decision supports (CDS) for pre-visit planning, primary care hypertension visits, and continuity of care.	Healthcare team members are meaningfully using CDS.	Data is integrated with knowledge to improve targeted decisions during the workflow to improve efficiency and accuracy.	Clinical Information System

NOTE: Strategy 5 is more complex and may require a specialized skill set to implement without Information Technology support.

TABLE CONTINUED NEXT PAGE

TABLE 4: STRATEGIES

Strategy	Description	Rationale	Domain
6. Measure blood pressure accurately and consistently in the office.	Ensure that hypertension is accurately and consistently measured by all members of the healthcare team.	Consistent measurement is required for comparison across the team or across practices.	Delivery System Design
7. Identify specific resources for patient education and insert into the workflow.	Educate patients regarding self-management, lifestyle modification (including diet, exercise and sodium intake), and community resources.	Patient engagement improves outcomes.	Promote Self-Management
8. Encourage home blood pressure monitoring and incorporate into decision-making as appropriate.	Ensure that patients are knowledgeable about home monitoring and performing it as appropriate.	Patient engagement improves outcomes and allows for safe and efficient management between visits.	Promote Self-Management
9. Assess medication adherence.	Ensure that all patients are assessed for medication adherence periodically, or at each visit, if the patient has a history of non-adherence.	Medication adherence improves outcomes; medication reconciliation reduces errors.	Delivery System Design
10. Provide team-based care to support education, adherence, patient engagement, and to maximize self-management.	Develop clinical decision guidelines for referring to and providing care management among health care team members including, but not limited to; nurses, behavioral health clinicians, dieticians, health coaches, and panel managers.	Team-based care improves outcomes.	Decision Support

Strategy 1 Description

Use a consistent approach across practice and monitor adherence to the clinical practice guidelines. The recommendations are not fixed protocols that must be followed. For individual patients, the judgment of responsible clinicians remains paramount.

Clinicians and patients will develop individualized treatment plans, tailored to the specific needs and circumstances of the patient.

Strategy 1 Actions

Action 1: Review Million Hearts protocol, <https://millionhearts.hhs.gov/files/hypertension-Protocol.pdf> based on evidence-based guidelines and decide to use practice wide. The American Heart Association, American Stroke Association, Centers for Disease Control, and American College of Cardiologists recommend the targets established in JNC-7, not JNC8 guidelines for all ages.

Action 2: Gather clinical staff to make consensus decisions about:

- Specific medications to be prescribed for most patients with hypertension
- Medications to consider for patients with hypertension and certain medical conditions
- Starting dosages and dosage increases with each titration
- Time intervals for follow-up and titration

Action 3: Refer to the Strategies table below and review the domain on Promoting Self-Management for strategies on engaging patients in making lifestyle modifications. See Table 5: Lifestyle Modifications on the following page.

Action 4: Refer to the Million Hearts customizable template and accept the variables in red or modify them with other drug names, dosages, and titration. As needed, develop separate protocols for subpopulations with different treatment goals.

Action 5: Adopt the protocol across the practice or system and revise it over time to meet the needs of patients and staff.

Action 6: Measure success:

- Adherence to protocols.
- Clinician and staff satisfaction.
- Change in blood pressure.

TABLE 5: LIFESTYLE MODIFICATIONS

Modification	Recommendation	Approximate SBP^{**} Reduction (Range)^{††}
Weight reduction	Maintain normal body weight (body mass Index 18.5-24.9 kg/m ²)	5-20 mm Hg/10k
Adopt DASH ^{†††} eating plan	Consume a diet rich in fruits, vegetables, and lowfat dairy products with a reduced content of saturated and total fat	8-14 mm Hg
Dietary sodium reduction	Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride)	2-8 mm Hg
Physical activity	Engage in regular aerobic physical activity such as brisk walking (at least 30 min per day, most days of the week which may be broken into shorter time intervals such as 10 minutes each of moderate or vigorous effort)	4-9 mm Hg
Moderation of alcohol consumption	Limit consumption to no more than 2 drinks (e.g. 24 oz. beer, 10 oz. wine, or 3 oz. 80-proof whiskey) per day in most men, and to no more than 1 drink per day in women and lighter weight persons	2-4 mm Hg

[†] <https://www.nhlbi.nih.gov/files/docs/guidelines/jnc7full.pdf>

^{**} SBP -systolic blood pressure

^{††} The effects of implementing these modifications are dose and time dependent, and could be greater for some individuals

^{†††} DASH -Dietary Approaches to Stop Hypertension

Strategy 1 References:

1. Million Hearts protocol: <https://millionhearts.hhs.gov/files/hypertension-Protocol.pdf>
2. JNC 7: <https://www.nhlbi.nih.gov/files/docs/guidelines/jnc7full.pdf> Full version of The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Also includes physician reference card, slide shows, and free patient education materials for download.
3. American Society of hypertension (ASH) list of guidelines: www.ash-us.org/About-hypertension/hypertension-Guidelines.aspx
4. Note on 2013 published report regarding taking a new approach on treating high blood pressure in people over 60. http://www.heart.org/HEARTORG/Conditions/HighBloodPressure/PreventionTreatmentofHighBloodPressure/American-Heart-Association-backs-current-BP-treatments_UCM_459129_Article.jsp#.WLBxJYeQyig

Strategy 2 Description

Create and maintain a registry. Patients with hypertension are entered into a registry or uniquely flagged for easy identification. Identify a designated person to be responsible for maintaining the registry.

Strategy 2 Actions

Action 1: See below for available registry. If unavailable, or you would like to create one from your EHR, go to Action 2.

For the member network of OneCare Vermont, a web-based software called Care Navigator is available and contains information on diagnoses, risk score, and utilization metrics for attributed patients in Medicare, Medicaid, and Blue Cross Blue Shield Exchange products. Care Navigator has the ability to identify attributed members with hypertension and to reflect associated interventions. For more information on how to access this system please email carenavhelp@onecarevt.org.

Action 2: Create or update a roster of patients with a diagnosis of hypertension through an electronic reporting system using the following criteria:

Patients 18 to 85 years of age with a diagnosis for hypertension including I10, I16.9, I15, I97.3 (ICD-10-CM).

AND

Patient encounter during performance period (CPT or HCPCS): 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99341, 99342, 99343, 99345, 99347, 99348, 99349, 99350, G0402, G0438, G0439.

Query the past three years to capture patients who may not have had a visit in the last year.

Action 3: Print out the roster of patients organized by the practice as a whole and by prescriber.

- Review for patients who are missing and should be on the roster
- Review for patients who are present who should be removed

Action 4: Identify patients from this initial group whose blood pressure at the most recent visit is inadequately controlled (systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg.)

Of this smaller sample of patients with a systolic blood pressure $\geq 140/90$ mmHg, identify those patients who:

- have a history of medication non-adherence
- have missed or no-showed their last scheduled appointment
- are currently smoking cigarettes
- have frequent visits to the emergency department
- are not following up with referral or recommendation
- have not had a visit in six months or more
- have five or more unique active prescriptions
- have expired or unfilled prescriptions
- have a BMI of 25 or greater

Then, check further to identify those patients with a diagnosis of:

- diabetes mellitus type 2
- congestive heart failure
- renal failure

...in which case the threshold blood pressure is reduced to $\geq 129/79$

Action 5: Use the roster to:

- Track patients who need follow up based on the practice's protocols for managing patients with hypertension (strategy 1)
- Implement strategies from this toolkit, such as (strategy 10) provide team-based care to support education, adherence, patient engagement, and to maximize self-management.

Action 6: Assign a person or team to be responsible for updating and maintaining the registry on a monthly basis.

Action 7: Measure success:

- Number of patients on roster not seen in past ____ months.
- Number of patients on roster not contacted in past ____ months.
- Clinician and staff satisfaction.

Strategy 3 Description

Implement a pre-visit planning process.

Pre-visit planning is an important element in managing hypertensive patients and includes scheduling patients for future appointments at the conclusion of each visit, arranging for pre-visit lab testing, gathering the necessary information for upcoming visits and spending a few minutes to huddle and handoff

patients. Pre-visit planning can mean the difference between a clinic where the healthcare team is floundering and frustrated, and a clinic that runs smoothly with the capacity to handle any unanticipated issues that arise.

The actions outlined below can be implemented in their entirety or independently.

Strategy 3 Actions

Action 1: Re-appoint the patient at the conclusion of the visit. Follow the Million Hearts protocol for suggested time interval. <https://millionhearts.hhs.gov/files/hypertension-protocol.pdf>. At the conclusion of each visit, schedule patients for their next visit and any needed pre-visit labs. This saves time and reduces the number of staff touches in setting up planned care appointments.

If your practice doesn't have the capacity to hold future lab orders, employ a staff person to order lab tests according to Million Hearts protocol based on the patient's medications and condition a few days prior to the next appointment.

Action 2: Create and use a hypertension order set checklist.

The order set allows the clinician to indicate the interval until the next appointment and any associated labs required prior to that visit. It should be quick and convenient to use, requiring no more than a few seconds of clinician time. The order set checklist can be used by a medical assistant (MA) or clerk who can schedule the appointments and tests indicated by the clinician. See [Hypertension Order Set Checklist \(Appendix H\)](#) for a recommendation for tests to include in a hypertension order set checklist.

Action 3: Arrange for lab tests to be completed prior to next visit.

By performing lab tests before the visit the clinician and patient can discuss results and management decisions at the visit.

Arrange for the patient to come for lab testing a few days before the visit or develop a point-of-care testing for most tests so they can be performed the same day as the visit with the clinician. Have the test results available so clinicians and patients can discuss the results and make management decisions together during the face-to-face visit. Because the practice doesn't need to spend time contacting the patient with results after the visit, both the patient and the practice save time.

Action 4: Perform visit preparations.

Visit preparations can be done by the nurse or medical assistant (MA) the day before or just prior to the appointment. This will save time and reduce mistakes during the visit. Review the clinician's notes from the patient's last visit as well as notes from other clinicians who delivered interval care. If any care notes or results are not in the patient's record, the nurse or MA can call that office or department to obtain the information prior to the visit.

Print copies of lab test results to share with patients. If a patient portal is available, the nurse or MA can later refer patients to these results.

Action 5: For more complex patients, consider a pre-visit phone call or e-mail. The nurse or MA makes a pre-visit phone call to more complex patients, performing tasks such as medication reconciliation and agenda setting on the phone, and then pre-populating the next day's visit note with this information.

If, during any interaction with a patient, a driver is identified, this is an opportunity to engage in patient-centered responses that may reduce barriers to hypertension control.

Action 6: Establish a daily team huddle.

A five to 15-minute pre-clinic huddle brings the team together to review and share knowledge about the day ahead. In addition to being alerted to last minute staffing or schedule changes, as well as any special needs of the patients or team, the care team can use this time to determine how best to share the work. It is also a time where the nurse or MA who performed visit prep can tell the clinician about an abnormal lab result or a complex multi-disciplinary situation, giving the clinician an opportunity to consult with colleagues or other resources prior to the patient's visit.

Action 7: Measure success:

- Number of patients with a hypertension diagnosis and without a follow-up visit appointment
- Adherence to order set
- Missing labs
- Use of daily huddles
- Clinician and staff satisfaction

Strategy 3 References:

1. Steps Forward: <https://www.stepsforward.org/modules/pre-visit-planning>
2. <http://journals.sagepub.com/doi/abs/10.1177/1077558715573871>
3. <http://link.springer.com/article/10.1007%2Fs11606-016-3980-z>

Strategy 4 Description

Document in a systematic and standardized method in the EHR.

The strategy steps recommended below are suggestions for documentation and coding for a patient with a diagnosis of hypertension for template development. A template is an EHR documentation tool utilized for the collection, presentation, and organization of clinical data elements. Templates add an advantage by reminding clinicians to ask patients specific questions to ensure the documentation is complete and accurate. After standardizing your documentation for this planned visit type, move on to visits that may include a comprehensive review of the patient's health or care for acute illness.

Physicians working with their care delivery organizations and within medical neighborhoods should define professional standards regarding clinical documentation practices throughout their organizations and hospital service areas.

Include Subject Matter Experts on the Team

Careful, thoughtful design and the ongoing review of EHR templates and prompts are essential to successful implementation of this strategy. A collaborative approach that includes health information management services (HIMS), clinical documentation improvement (CDI) and information technology (IT) representatives is recommended when implementing EHR changes.

If your team doesn't already include a representative from one of these roles, you may want to consider including one now. Additionally, the team is strongly encouraged to engage its EHR vendors as soon as possible to assist in planning and implementation. Refer to [Vendor Engagement Strategies \(Appendix I\)](#).

Strategy 4 Actions

Action 1: Make a list of information that needs to be accessed, created, or captured related to the hypertension visit. Refer to your new workflow and identify the information that is needed to provide the best possible care to the patient, every time.

Action 2: A suggestion for hypertension visit documentation¹ is on the following page. Compare the data elements currently being captured by the healthcare team with what is suggested below and revise, add, or remove data elements, if necessary.

TABLE 6: PATIENT DEMOGRAPHIC INFORMATION

Subjective	<ul style="list-style-type: none"> • Chief Reason for Visit: Hypertension management • Presence/absence of acute problems • Pharmacological management of HTN <ul style="list-style-type: none"> › Adherence Assessment › Medication List
Objective	<ul style="list-style-type: none"> • Blood pressure and pulse
Assessment	<ul style="list-style-type: none"> • Problem List/Diagnosis: Hypertension, (HTN), High BP, Elevated BP, Borderline HTN, Intermittent HTN, History of HTN, Hypertensive vascular disease (HVD), Hyperpiesia, • ICD 10 Code: I10, I16.9, I15, I97.3 • Diabetes Diagnosis: • Smoking status: • Blood Pressure 1: At goal or not? • Blood Pressure 2: At goal or not? • Blood Pressure 3: At goal or not? • Home Blood Pressure Monitoring Readings: At goal or not? • Possible reasons why not at goal: <ul style="list-style-type: none"> › non-adherence, and reason for non-adherence › diet and exercise › smoking › white coat syndrome › other
Plan	<ul style="list-style-type: none"> • Medications: Change or no change? • Counseling: <ul style="list-style-type: none"> › Basics of hypertension › Adherence counseling › Patient teach-back • Self-Management Assistance: <ul style="list-style-type: none"> › Home BP monitoring kit › Pill box • Referrals <ul style="list-style-type: none"> › Nutrition › Self-Management Programs › Behavioral health/social work › Community Health Team › Nurse Care Manager › Financial counseling • Return visit
Encounter Code	<ul style="list-style-type: none"> • 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99341, 99342, 99343, 99345, 99347, 99348, 99349, 99350, G0402, G0438, G0439

Action 3: Review [Workflow Background and Knowledge Area Primer \(Appendix J\)](#).³

Action 4: Map the data elements using [Data Element Capture Template \(Appendix K\)](#), based on what is currently occurring. Identify the data elements that are not being documented consistently.

Action 5: Determine guidelines for completing the hypertension template, including how and where information should be documented. Write down the steps in narrative form and show visually in a workflow, using screen shots whenever possible. Get consensus from clinicians and team members responsible for documentation. Specificity is important.

Vendor Request

Ask your EHR vendor for a data workflow diagram to visually depict data flow.

Action 6: Identify a training plan for appropriate staff on what to put into the EHR.

Action 7: Measure success:

- Test the usability of the revised template
- Test the training of the revised template
- Consensus of users

Strategy 4 References:

1. https://millionhearts.hhs.gov/files/NYC_HHC_Hypertension_Protocol.pdf
2. http://library.ahima.org/doc?oid=107665#.WQIQ_LN0zcv
3. <https://www.healthit.gov/sites/default/files/onc-beacon-lg3-ehr-data-quality-and-perform-impvt.pdf>

Strategy 5 Description

Note that this strategy is more complex and may require a specialized skill set to implement without Information Technology support.

Integrate clinical decision supports (CDS) in the EHR for pre-visit planning, primary care hypertension visits, and continuity of care. CDS is not intended to replace clinician judgment, but rather is a tool to assist care team members in making timely, informed, higher quality decisions. The “Five Rights”¹ concept provides a best practice framework for considering CDS options appropriate for practice. The Five Rights concept states that we can achieve CDS-supported improvements in health outcomes if we communicate:

1. **the right information** - evidence-based guidance. (e.g., recommended dose ranges and drug interactions from the Million Hearts protocol for controlling hypertension in adults).
2. **to the right people** (entire care team – including the patient)
3. **through the right channels** (e.g., EHR, mobile device, patient portal)
4. **in the right intervention formats** – For example, an alert, order set, flow-sheet, or reference information to answer a clinical question.
5. **at the right points in workflow** – at a time of decision or action such as outside encounters, pre-visit, check-in, rooming, during exam, after exam, post-visit (e.g., at medication order entry, at medication verify/dispense, blood pressure measurement and recording, highlighting abnormal blood pressure readings in the EHR).

Strategy 5 Actions

Action 1: Identify your super user/s. The super user/s will function as the in-house expert/s on the EHR and works closely with the healthcare team. The super user/s configures the EHR software, creates templates and order sets, and also develops revised workflows or standard operating procedures to address issues raised by front-line users.

It is often helpful to have the super user be the main point of contact with the EHR vendor.

Action 2: Start simply: adopt one new CDS intervention in the EHR, rather than an entire CDS system. Review the CDS interventions below. Choose the one, or several, that are most simple to implement and/or that you believe will have the most significant impact. See [CDS Intervention Rating Scale \(Appendix L\)](#) to help your team prioritize the CDS interventions. This is not an exhaustive list, and they can be combined.

Knowledge resources and filtered reference information

- Use of the UpToDate® HL7 Infobutton to provide linked clinical decision support and patient information distribution. The Infobutton facilitates quick access to UpToDate tailored content based on your search query <http://www.uptodate.com/home/ehr-interface>
- Hypertension treatment templates based on evidence-based clinical guidelines, including treatment by stage of hypertension and risk stratification
- Suggestions and exclusions for medications based on concurrent medical conditions
- Reminder of the underlying causes of nonessential or secondary hypertension
- Indications for referral to a hypertensive specialist
- Hypertension management templates with questions about self-care, weight, physical activity level, blood pressure monitoring, and salt intake
- * Prepopulated hypertension order sets, including preferred medications (generics, 90-day supplies)
- Formularies are added to e-prescribing lists to help minimize patient out-of-pocket costs
- Blood pressure medication default to 90-day supply to decrease patient time spent obtaining refills
- Medication refill review tool, such as the Medicare Prescription Drug Improvement and Modernization Act (MMA), to assess adherence
- Prepopulated referrals for nutrition and/or behavioral health counseling
- Targeted highlighting of relevant data

* This intervention is included in Strategy 3.

Interruptive activities such as EHR alerts and reminders

- Reminder to order pertinent labs (creatinine, urine protein, etc.)
- Reminder to order home blood pressure monitor prescription
- Reminder to provide patient education materials on the DASH diet
- Reminder to use a visit summary for ‘teach back’ to make sure patient understands treatment plan including medications, follow-up appointments, lifestyle goals, etc.

Action 3: Reach out to your vendor/system designer to discuss how the identified CDS intervention/s may support the practice’s hypertension control goal.²

Suggested questions for a conversation with your EHR vendor/designer:

- Within this cluster of interventions, which have been shown to have the most impact? Which are the easiest to turn on? Which are most likely to be accepted by end-users?
- How can we configure and customize CDS interventions to suit our practice needs and workflow?

- Can we select specific alerts and reminders, or are the rules preset packages of alerts that can only be turned on or off wholesale?
- Do we have the appropriate hardware and software to most effectively use CDS functionality?
- Are there already CDS “components” that we can use, such as logic, rules templates, screen designs, interfaces?

Action 4: Partner with your EHR vendor/system designer to configure the CDS intervention for greatest usability and positive impact.

Develop a CDS specification document for each adopted rule, with a detailed description of the CDS that includes all information explicitly spelled out, including algorithms used to produce data and mapping information. Your EHR vendor should develop this document for your practice.

Action 5: Measure success:

- Progress on plan to implement CDS intervention.
- Usefulness of implemented CDS intervention.
- Usability of implemented CDS intervention.
- Use of implemented CDS intervention.
- Satisfaction with implemented CDS intervention.

Strategy 5 References:

1. Osheroff JA, Teich JM, Levick D, Saldana L, Velasco FT, Sittig DF, Rogers KM, Jenders RA. Improving Outcomes with Clinical Decision Support: An Implementer’s Guide. HIMSS press, 2012.
2. <https://www.healthit.gov/policy-researchers-implementers/cds-implementation>. <https://www.healthit.gov/sites/default/files/3-4-3-successful-cds.pdf>

The Office of the National Coordinator for Health Information Technology (ONC) is at the forefront of the administration’s health IT efforts and is a resource to the entire health system to support the adoption of health information technology and the promotion of nationwide health information exchange to improve health care. ONC is organizationally located within the Office of the Secretary for the U.S. Department of Health and Human Services (HHS). The position of National Coordinator was created in 2004, through an Executive Order, and legislatively mandated in the Health Information Technology for Economic and Clinical Health Act (HITECH Act) of 2009.

Healthit.gov is the official website for the ONC: <https://www.healthit.gov/providers-professionals/clinical-decision-support-cds>

HIMSS is a global, cause-based, not-for-profit organization focused on better health through information technology (IT). HIMSS leads efforts to optimize health engagements and care outcomes using information technology: <http://www.himss.org/>

Strategy 6 Description

Measure Blood Pressure accurately and consistently in the office.

Strategy 6 Actions

Action 1: These seven simple tips on the left side below help clinicians and staff obtain accurate blood pressure readings. They avoid the problems noted on the right side of Table 6.

TABLE 6: SOLUTIONS TO COMMON PROBLEMS ACCOUNTING FOR INACCURATE BLOOD PRESSURE READINGS	
Do this	To avoid this
Empty bladder first	Full bladder adds 10 mm Hg
Don't have a conversation	Talking or active listening adds 10 mm Hg
Use correct cuff size	Cuff too small adds 2-10 mm Hg
Put cuff on bare arm	Cuff over clothing adds 5-50 mm Hg
Support arm at heart level	Unsupported arm adds 10 mm Hg
Keep legs uncrossed	Crossed legs add 2-8 mm Hg
Support back and feet	Unsupported back and feet adds 6.5 mm Hg



See [AMA Tips for Accurate Blood Pressure Reading \(Appendix M\)](#) for tips for taking an accurate blood pressure in a one-page visual from the American Medical Association that is available for download and posting to educate and remind staff.

Action 2: Measure success:

- Satisfactory techniques in staff performance review

Strategy 6 References

1. Pickering, et al. Recommendations for blood pressure measurement in humans and experimental animals part 1: Blood Pressure Measurement in Humans. *Circulation*. 2005;111:697-716.
2. Handler, J. The importance of accurate blood pressure measurement. *The Permanente Journal*. Summer 2009. Volume 13. No.3-51.

Strategy 7 Description

Identify specific resources for patient education and insert into the workflow:

Examples of popular patient education resources are available at these links –

A simplified version of the DASH (Dietary Approaches to Stop Hypertension) diet, available at the Vermont Department of Health, has received national acclaim by Million Hearts partners because it has effectively translated the DASH diet for reduced literacy and has incorporated helpful related information in relatively few pages. The DASH eating plan for controlling blood pressure is also a good basic weight control eating plan for type 2 diabetes or prediabetes.

http://www.healthvermont.gov/sites/default/files/documents/2016/12/HPDP-Diabetes_dash%20eating%20plan.pdf

Additional information to help patients reduce dietary sodium is available at the CDC. Tips include how to reduce sodium while shopping in the supermarket and while eating out in restaurants. https://www.cdc.gov/salt/reduce_sodium_tips.htm

The authors of this toolkit assume that practices will have their “favorite” patient education resources. While the Learning Collaborative planned during the initial release of this toolkit is underway, authors will solicit practices’ favorite patient education resources for addition to the toolkit.

Strategy 7 Actions

Use these tips for inserting patient education into the workflow.

Action 1: Identify all patient education resources by topic and inform office staff about location (hard copy versus electronic, down-loaded as handout versus electronic link provided to patient).

Action 2: Determine where (treatment room versus reception area), when (during or after visit) most patient resources will be distributed, and by whom (clinical or administrative staff). Note that patients are more likely to consider the detail in a resource when it is introduced interactively (by staff with patient) rather than referenced verbally without a “show and tell” approach.

Action 3: Use other techniques for effective patient engagement:

1. Developing and maintaining good relationships with patients involve face-to-face meetings during office visits and in between.
2. Face-to-face visits use evidence-based communication strategies such as motivational interviewing.
 - a. Using open-ended questions: ask questions that require more than a “yes” or “no” answer and that help discover what the patient thinks is important.

Example – “What have been your goals and techniques for improving blood pressure control in the past?”

- b. Reflective listening: repeating or rephrasing what a patient says, or asking for clarification to better understand a concern.
- c. Positive reinforcement: encourage the healthy ideas or behaviors that patients mention.
- d. Ask-tell-ask: elicit information that the patient knows, briefly fill in the gaps, and then ask for the patient’s reaction to what you told them. Example – “What do you know about food and blood pressure”? If they answer about sodium restriction, tell them briefly about the DASH diet. Conclude with “Does this DASH diet information interest you?”
- e. Teach-back: ask patients to tell you what they took away from the conversation and what they think the next steps should be.

With motivational interviewing clinicians use information from the patient to assist the patient in addressing ambiguities affecting self-management behaviors. The multiple self-management behaviors that impact blood pressure (diet, physical activity, managing stress, taking medication) offer providers many options to engage patients in behavior improvement that matches patients’ readiness and interests.

Action 4: Measure success:

- Positive feedback from patients
- Evidence of patient self-management action plans
- Capturing select home BP readings in the EHR
- Clinician and staff satisfaction

Strategy 7 References

1. Patient-Centered Interactions. Engaging Patients in Health and Healthcare. Safety Net Medical Home Initiative. May 2013. <http://www.safetynetmedicalhome.org/sites/default/files/Executive-Summary-Patient-Centered-Interactions.pdf>
2. Engaging Patients through Evidence-based Communication Strategies. Target BP: <http://targetbp.org/wp-content/uploads/2016/10/Communicating-with-Patients-Strategies-and-Skills-Fact-Sheet.pdf>

Strategy 8 Description

Encourage home blood pressure monitoring and incorporate into decision making as appropriate.

Strategy 8 Actions

Recommended guidelines for encouraging and distributing home blood pressure (BP) monitors:

Action 1: Provide patient education using a trained health care provider (e.g. pharmacists, nurse practitioners, physician assistants, health educators) before recommending self-monitoring of home BP.

Action 2: Ask the patient about her/his comfort with using the monitor (as demonstrated at the clinical site) and willingness to adhere to recommended standards for obtaining an accurate measurement (seated, at rest, no caffeine, correct body position, placement of cuff, etc.).

Action 3: Confirm that the patient is able and willing to keep written records [see [Blood Pressure Log Template \(Appendix N\)](#) and a completed example in [Sample Blood Pressure Log \(Appendix O\)](#)] and regularly communicate with provider.

Action 4: Concurrently provide support for self-management skills with medication adjustments (type and/or dose).

Action 5: Ask if patient is able to take two or three successive readings (at one-minute intervals) at least twice a day, once in the morning and once in the evening.¹

Action 6: Ask if patient is willing to participate in ongoing support live or telephonically.

Action 7: Consider the patients' adherence to their currently prescribed regimen.

Action 8: Consider patient characteristics that correspond with successful home BP monitoring - elderly, people with diabetes or chronic kidney disease, pregnant women, patients with suspected or confirmed white coat hypertension², and patients with suspected or confirmed masked hypertension (nonelevated BP in the clinic setting that is elevated when assessed by ambulatory monitoring).³

Action 9: Consider other characteristics that are contraindicated for home self-monitoring. Some patients may become obsessed about taking readings. The inherent variability of BP means that there will inevitably be some high readings, which in anxious patients may exacerbate their anxiety, leading to further increases of BP and effectively setting up a vicious cycle. In such patients frequent checking of their BP should be discouraged, and in extreme cases it should be discontinued altogether².

Action 10: Measure success:

- Evidence of home readings affecting treatment plan
- Patient, clinician and staff satisfaction with home BP monitors
- Capturing select home BP readings in the EHR

Strategy 8 References

1. https://millionhearts.hhs.gov/files/MH_SMBP_Clinicians.pdf
2. Pickering TG, Miller NH, Ogedegbe G, Krakoff LR, Artinian NT, Goff D. Call to action on use and reimbursement for home blood pressure monitoring: A Joint Scientific Statement from the American Heart Association, American Society of Hypertension, and Preventive Cardiovascular Nurses Association. *Hypertension*. 2008;52:10–29.
3. Wang YC, Shimbo D, Muntner P, Moran A, Krakoff L, Schwartz JE. Prevalence of masked hypertension among US adults with nonelevated clinic blood pressure. *American Journal of Epidemiology*. 2017;185(3):194–202.

Strategy 9 Description

Assess Medication Adherence. Approximately half of patients with hypertension do not adhere well to their prescribed anti-hypertensive therapy.¹ Medication adherence, which is critical for blood pressure control, is affected by multiple factors.

The following strategies increase adherence and consistency among patients taking medication to control hypertension:²

- Keep medication regimens simple (once or twice daily dosing)
- Encourage home self-monitoring of blood pressure
- Use patient portals or email to communicate with patients between visits
- Urge patients to use pill boxes or other methods to organize multiple medications for daily use
- Help patients implement a strategy to refill prescriptions before running out of medications
- Use a team-approach to support patient self-management
- Monitor the cost of medications and the patient's ability to pay for medications

The following factors are associated with non-adherence:³

- Limited language proficiency or low literacy
- History of mental health issues (depression, anxiety, addiction)
- Belief that medications are unnecessary or harmful, or disbelief in the treatment benefits
- Concerns about side effects
- Concerns about costs of medications
- Reports of being tired of taking medications

Medication reconciliation, which means comparing medication orders to the list of medications that a patient reports taking, is usually accomplished by primary care staff during the patient visit. This process helps reduce prescription errors and tracks factors impacting nonadherence such as skipped or reduced doses, lack of knowledge about how the medication works (also shown to reduce adherence), and the presence of bothersome side-effects.

The 4-question and 8-question versions of the Morisky Medication Adherence Scale (MMAS) have been used in a pilot by a primary care practice in Vermont to evaluate adherence to anti-hypertensive medications. Front desk staff distribute these questionnaires to hypertensive patients during non-acute appointments. Nurses review the completed MMAS with the patients, identify the causes of poor adherence, and select appropriate interventions. This has resulted in improved blood pressure control.

Many electronic health records may include patient assessments that are designed to measure non-adherence. For example a three item scale is built into the Epic based EHR to assess Commitment, Concern, and Cost.

- Commitment: I am convinced of the importance of my prescription medicine.
- Concern: I worry that my prescription medicine will do me more harm than good.
- Cost: feel financially burdened by my out-of-pocket expenses for my prescription medicine.

The anchors for this 6 point scale are from Agree Completely to Disagree Completely⁴. There is no one ideal patient reported measure of medication adherence according to a recent review⁵. Clinicians are encouraged to use whichever is most appropriate or easy to use in their own settings.

Licensing Information⁶ – MMAS Research LLC is the body that provides diagnostic assessment solutions for using the validated Morisky Medication Adherence Scale™. For some uses, there is no fee – but depending on the intended use there may be costs per patient to use the MMAS. Costs are usually associated with publishing data. In addition, there are clinical data and care management programs that have incorporated the Morisky scale into their platforms. These programs include Care Coordinator and Population Health Logistics.

Measure success:

- Usability of medication adherence tool
- Identification of barriers to adherence and solutions
- Improved individual blood pressure control
- Select home BP readings noted in the EHR
- Patient satisfaction

Strategy 9 References

1. Kettani FZ, Dragomir A, Cote R, Roy L, Berard A, Blais, L, Lalonde L, Moreau P, Perreault S. Impact of a better adherence to antihypertensive agents on cerebrovascular disease for primary prevention. *Stroke*. 2009;40:213-220.
2. Hill, MN, Miller, NH et al. ASH position paper: adherence and persistence with taking medication to control high blood pressure. *J Clin Hypertension*. 2010;12:757-764.
3. Improving medication adherence among patients with hypertension, a tip sheet for professionals. Million Hearts: https://millionhearts.hhs.gov/files/TipSheet_HCP_MedAdherence.pdf
4. McHorney, C. A., Victor Spain, C., Alexander, C. M., & Simmons, J. (2009). Validity of the adherence estimator in the prediction of 9-month persistence with medications prescribed for chronic diseases: A prospective analysis of data from pharmacy claims. *Clinical Therapeutics*, 31(11), 2584-607. doi: <http://dx.doi.org/10.1016/j.clinthera.2009.11.030>
5. Nguyen, T.-M.-U., Caze, A. L., et al. (2014). "What are validated self-report adherence scales really measuring?: a systematic review." *British Journal of Clinical Pharmacology* 77(3): 427-445.
6. <http://morisky.org/solution/MoriskyWidget>

Strategy 10 Description

Provide team-based care to support education, adherence, patient engagement, and to maximize self-management. The multidisciplinary team consists of clinicians working within the primary care site as internal staff or in the local community.

The focus of Table 7 is individual patient care:

- Drivers**
 Problems or situations associated with poor blood pressure control
- Initial Clinical Approach/Response**
 What the clinician or staff would do initially at the time the problem/situation presents. The initial

communication can come from medical office assistant, nurse or other staff in addition to physician, PA, NP, etc. Practice policies for documenting communication and patient response will vary based on team work flow and patient hand-offs before, during, and after the visit.

- Community-Clinical Linkage**
 Evidence-based programs or other community-based services that are available.
- Follow-up Action**
 The clinician’s next steps after the initial approach

TABLE 7: INDIVIDUAL PATIENT CARE FOR BLOOD PRESSURE CONTROL	
<div>Driver</div> <div>High BP reading</div>	<div>Clinical Approach/Response</div> <div>Consult Million Hearts protocol for clinical practice guidelines https://millionhearts.hhs.gov/files/Hypertension-Protocol.pdf</div>
	<div>Community-Clinical Linkage</div> <div>If patient has prediabetes refer to YMCA’s Diabetes Prevention Program (evidence-based for BP reduction): http://myhealthyvt.org/diabetes-prevention/</div>
	<div>Follow-Up Action</div> <div>Re-check and review readings within one month or three months, depending on current BP.</div>

TABLE CONTINUED NEXT PAGE

TABLE 7: INDIVIDUAL PATIENT CARE FOR BLOOD PRESSURE CONTROL

Driver History of medication non-adherence	Clinical Approach/Response Clinician inquires, “Tell me about the reasons you are not taking your medication.” Reasons may include; cost, confusion about dosing, forgetfulness, and/or low engagement in treatment plan.
	Community-Clinical Linkage Pharmacist or Behavioral health clinician may help.
	Follow-Up Action Cost? – Instruct patient to call Green Mountain Care: 1-800-250-8427 for prescription assistance information. Or call Partnership for Prescription Assistance 1-888-477-2669 or visit www.pparx.org to check eligibility for help. Confusion about dosing? – Provide explanation about dosing. Ask patient to invite support person to attend future appointment and assist in understanding medications. Forgetfulness? – Assess cognitive status, living arrangement, emotional status, e.g., assess depression (PHQ-2) Low engagement in treatment plan? See Strategy 7 tips for patient engagement (page 35). See Strategy 9 (page 39) for more information about assessing medication adherence.
Driver Currently smoking cigarettes	Clinical Approach/Response Clinician uses motivational interviewing (MI) to identify stage of change and tailors discussion accordingly.
	Community-Clinical Linkage Smoking cessation program. http://myhealthyvt.org/quitting-smoking/
	Follow-Up Action Referral to a behavioral health clinician within practice, community health team or wider community.
Driver Not following up with referral or recommendation	Clinical Approach/Response Clinician inquires as to the reasons the patient is not following up with referral or recommendation. Low engagement in treatment plan? Transportation, cost and/or insurance barriers? Forgetfulness? Respond accordingly.
	Community-Clinical Linkage Medicaid beneficiaries may receive transportation to select medical appointments.

TABLE CONTINUED NEXT PAGE

TABLE 7: INDIVIDUAL PATIENT CARE FOR BLOOD PRESSURE CONTROL

Driver	Clinical Approach/Response
Has not had a visit in six months or more	Clinician reinforces the patient for coming in, asks about the reasons for the long interval between visits and emphasizes the importance of compliance with scheduled visits.
	Follow-Up Action
	Schedule future planned visit(s) and use phone reminders.
Driver	Clinical Approach/Response
Has five or more unique active prescriptions	Clinician reviews medications and Million Hearts protocol. Makes appropriate medication change recommendations to reduce total unique prescriptions. Engages in shared decision making with the patient taking into consideration any lifestyle preferences of the patient.
Driver	Clinical Approach/Response
Has expired or unfilled prescriptions	Clinician reviewing medications inquires, “I see you have unfilled prescriptions, tell me more about that?” Transportation, cost and/or insurance barriers? Forgetfulness? Low engagement in treatment plan? Respond accordingly.
(visible during home visit or during office visit when patient brings in prescription information and pill containers)	Community-Clinical Linkage
	Consider coaching patient to consolidate pharmacies and/or align multiple prescriptions for coordinated renewal.
	Follow-Up Action
	Medication reconciliation at follow-up office visit. See Strategy 9, Assess medication adherence (page 39).

TABLE CONTINUED NEXT PAGE

TABLE 7: INDIVIDUAL PATIENT CARE FOR BLOOD PRESSURE CONTROL

Driver Has a BMI of 25 or greater	Clinical Approach/Response Clinician uses motivational interviewing to identify stage of change and tailors discussion to support self-management. Refer to Million Hearts Protocol for suggested lifestyle (diet and exercise) changes: Consider a referral to a behavioral health clinician and/or a dietitian.
	Community-Clinical Linkage Consider WeightWatchers, Curves, Curves Complete, and the YMCA's Diabetes Prevention Program (latter if the patient has prediabetes).
	Follow-Up Action If patient participates in YMCA's Diabetes Prevention Program check back with patient about their food and physical activity records and progress during this year-long program.
Driver Has a diagnosis of type 2 diabetes	Clinical Approach/Response Refer to Million Hearts protocol https://millionhearts.hhs.gov/files/Hypertension-Protocol.pdf Ask patient if s/he is interested in learning more about managing diabetes. If yes, reinforce e.g., "you must really care about your health to be willing to join a self-management program."
	Community-Clinical Linkage Refer to Healthier Living Workshop-Diabetes http://myhealthyvt.org/diabetes-management/ Depending upon self-tailored action plans patient may select behaviors that improve diabetes and blood pressure management.
	Follow-Up Action Check back with patient about their action plans, and progress during and after the six-week diabetes program
Driver Has a diagnosis of congestive heart failure (CHF)	Clinical Approach/Response Clinician refers to Million Hearts protocol.
	Community-Clinical Linkage Refer to Healthier Living Workshop – Chronic Disease http://myhealthyvt.org/chronic-disease/ Also check with the VT Assembly of Home Health Agencies about CHF-related programs.
	Follow-Up Action Check back with patients about their accomplishments and satisfaction with participation in community-based programs. Check with local hospital service area about programs and services for CHF.

TABLE CONTINUED NEXT PAGE

TABLE 7: INDIVIDUAL PATIENT CARE FOR BLOOD PRESSURE CONTROL

Driver Has resistant hypertension*	Clinical Approach/Response Consider underlying causes such as dietary or medication non-adherence, unidentified secondary cause (including NSAID or other competing medication use, Obstructive Sleep Apnea, renal artery stenosis and others), white coat HTN, or a sub-optimal HTN regimen. Experts recommend optimizing volume, and consideration of aldosterone blockade with spironolactone
	Community-Clinical Linkage Refer to CHT for optimization of non-pharmacologic strategies.
	Follow-Up Action Consider a consult with or referral to Medical Center (UVMHC) or Dartmouth Hitchcock Medical Center (DHMC) Nephrology Services. Providers can contact a nephrologist centrally at UVMHC by calling Provider Access Services: 1-800-639-2480 and ask for the nephrologist on call, or a patient's specific nephrologist. See locations below for UVMHC-affiliated Nephrology Clinics. DHMC Nephrology Services are decentralized with nephrologists available at the numbers below for consultation or referral.

* Resistant HTN is defined as BP that remains above goal despite use of three meds of different classes, one of which is a diuretic. Resistant HTN is associated with higher rates of adverse CVD events.

TABLE 8: CONSULTATION WITH AND REFERRAL TO NEPHROLOGISTS

Dartmouth Hitchcock Medical Center	NH Town/City	Phone Number
	Keene	603 354-6622 option 3
	Lebanon	603 653-3830
	Manchester	603 695-2640
	Nashua	603 695-2640
University of Vermont Medical Center	VT Town/City	Phone Number
	Burlington	802 847-3572
	Berlin (CVMC)	802 847-3572
	Milton Family Practice	802 847-3572
	Newport (NCH)	802 847-3572
	Rutland (RRMC)	802 747-6292

Measure success:

- Patient, clinician and staff satisfaction
- Documented referrals to community-based programs and services



Step 2.5

Design the new workflow



Time: One hour

Based on the strategies selected and developed in Step 2.4, describe the future process of caring for a patient with hypertension, which represents the ideal care process. Then, complete the following steps, documenting the results on a white board/flipchart.

Task 1: Develop the new flow of work, including all the selected strategies. Identify a specific patient and briefly describe the patient as s/he is moving through the new process. Keep the patient in mind as you further develop the new workflow.

Task 2: List the process steps in chronological order. Group the process steps into functions with one role per function, and/or time frames. For example, functional groupings might include; check-in, rooming, physician encounter, and check-out. Time frames might include; during the current visit, before the next visit, and during the next visit.

Task 3: Write each functional step on a sticky note and assemble onto a white board/flip chart. Check for missing steps.

Task 4: Now, go back and identify any steps needed to make sure that complete and accurate information is available at each functional step. Think about how your EHR can support this objective.

Task 5: Refer to the [AMA Process Map Toolkit \(Appendix F\)](#), which you may have used to develop your current state workflow. Use the process map symbols and line connectors to further develop your new workflow.



Step 2.6

Draft Implementation Plan



Time: One hour

Using the new flow of work, list all the strategies selected in the left hand column of the team's implementation plan. Refer to [Implementation Plan Template \(Appendix P\)](#).

Task 1: For each strategy selected, identify:

- Any additional information needed to use the strategy
- Any resources needed (people, funds, space) to use the strategy
- Provider or staff training (e.g. use of assessments; telephone scripts)
- The measures used to identify successful implementation
- The actions necessary to put the strategy in place
- A plan to communicate what will happen to those affected by these changes

Task 2: List actions identified above next to each strategy in the Implementation Plan and complete with the name of the team member following up on this work and the date he/she will next update the team on progress.

Task 3: Review again the results of the Practice Survey at Baseline for action steps needed for successful implementation in your practice. Re-issue the Practice Survey and compare outcomes.

Task 4: Document progress for each strategy listed in the right hand column of the Implementation Plan. Add to this worksheet over time.

Step 2.7

Check in with practice leaders



Time: 30 minutes

The project team meets with the Practice Leaders and reviews, at a minimum, the results of Stage 2, steps 2.4, 2.5 and 2.6:

- Stage 2, Step 2.4: Review and select strategies: identify the strategies chosen for improving hypertension management
- Stage 2, Steps 2.5: Design the new flow of work: share the ideal patient care process including new tasks proposed for practice members.
- Stage 2, Step 2.6: Draft implementation plan: share the implementation plan, including information, resources, and training needed to put it into action.

STAGE 3: IMPLEMENT

Project team and other practice members review the team's work and collaborate in putting some or all of the selected strategies in place.



Time: Variable

The time necessary to complete this stage depends on the amount of work identified in the Implementation Plan worksheet, which can vary from one hour/strategy to two hours/strategy. (Changes involving Information Technology support may take longer depending on the software application.)

The two steps in this stage are listed below, with more detail on following pages.

Steps:

3.1 Implementation plan and measures

3.2 Evaluation and closure

Stage 3 References

1. Connie van Eeghen, Charles D. MacLean, Amanda G. Kennedy. Improving Opioid Prescribing: Sustainable Solutions for Vermont. Opioid Prescription Management Toolkit for Chronic Pain, Facilitator Manual. UVM and State Agricultural College. 2014.

Step 3.1

Implementation Plan and Measures

Task 1

Plan Updates: Team members meet separately or together to carry out the Implementation Plan. The team meets weekly to update the Implementation Plan Worksheet, as needed.

Task 2

Progress Measures: Team members measure the progress for each of the strategies selected, as determined in Stage 2, Step 5 and documented in the Implementation Plan.

Task 3

Practice Assessment Post-Project: Survey the entire practice using the same method with which the pre-project survey was conducted. This may be the [Practice Readiness Assessment \(Appendix A\)](#) if you chose to use it.

- Use the same list of clinicians and staff for the previous survey.
- Distribute the survey, with instructions about the date it should be returned and where it should be sent.
- Average the responses for each statement.
- Compare these averages with those calculated for the same statements in the previous survey and review all comments. Decide if the practice has experienced a change and, if so, whether it is a change that represents a success or identifies new issues to be addressed.

Task 4

Chart Reviews: Create a template for future chart reviews based on the strategies selected. Suggested items to collect:

- Blood pressures documented in a captured field
- Number of times a patient with hypertension has a visit in a year
- Monitors based on strategies (for example, patient education provided, home blood pressure monitoring documented, medication adherence assessed, etc.)

Step 3.2

Evaluation and Closure

Task 1

Evaluation: The team determines whether the project has achieved the objective identified in its A3 or whether the team needs to change the implementation plan or any of the strategies selected. As needed, follow up with practice leaders. If complete, the team develops a recommendation for long term monitoring.

Task 2

Closing Report: When the team has determined that the project is sufficiently complete to bring it to a close, it reviews the results of its work with Practice Leaders and provides recommendations for long term monitoring. Team members organize and submit the notes taken during team meetings to document their progress, measures, outcomes, and recommendations.

Task 3

Long Term Monitoring: Practice leaders determine who in the practice should monitor hypertension management by identifying specific measures, an individual to organize data collection, frequency of data collection, and reporting expectations.

Task 4

Completion of Stage 3: Practice leaders confirm the team's work and results. Practice leaders take responsibility for long term monitoring. Everybody celebrates – finishing a project, regardless of size or number of changes, is an accomplishment.

Pay for Performance Quality Programs



Leveraging a hypertension control improvement project into financial incentives in pay-for-performance quality programs

Merit-Based Incentive Payment System (MIPS)

MIPS eligible clinicians and groups can choose to report on NQF 18, controlling hypertension, which meets the requirement for a high priority measure. In MIPS, the higher the performance on a measure, the more points earned for that measure. Points get counted toward a final score, which is then assessed by the Center for Medicare to calculate a financial incentive on all Medicare Part B reimbursements in the payment year. The benchmark for NQF 18 is based on 2015 PQRS data.

For providers reporting using the claims method, a performance score of 93% or above will earn the full ten points for this measure.

For providers reporting using the EHR method, a performance score of 81% or above will earn the full ten points for this measure.

For providers reporting using the registry method, a performance score of 91% or above will earn the full ten points for this measure.

See <https://qpp.cms.gov/measures/quality> for more information about the Quality Payment Program (QPP). On the following page is a screenshot of the hypertension measure from the QPP website.

ADD

Measure Number <ul style="list-style-type: none">• eMeasure ID: CMS165v5• eMeasure NQF: N/A• NQF: 0018• Quality ID: 236	NQS Domain Effective Clinical Care	Measure Type Intermediate Outcome
High Priority Measure Yes	Data Submission Method <ul style="list-style-type: none">• Claims• CMS Web Interface• EHR• Registry	Specialty Measure Set <ul style="list-style-type: none">• Internal Medicine• Cardiology• Obstetrics/Gynecology• Preventive Medicine• Thoracic Surgery• Vascular Surgery• General Practice/Family Medicine
Primary Measure Steward National Committee for Quality Assurance		

FIGURE 4: HYPERTENSION MEASURE FROM QPP WEBSITE

Shared Savings Programs

Medicare

The OneCare Vermont (OCV) and Community Health Accountable Care (CHAC) provider networks are participating in the Medicare Shared Savings Program (MSSP) for the 2017 reporting year. ACO-28 corresponds with NQF 18, controlling hypertension. The higher the level of performance, the higher the corresponding number of quality points earned. Performance at or above the 90th percentile of the quality performance benchmark earns the maximum points available for the measure. Accountable Care Organizations may receive 4 additional points in a domain by demonstrating quality improvement. The total points earned for measures in each domain, including any quality improvement points, will be summed and divided by the total points available for that domain to produce a domain score of the percentage of points earned relative to points available. The percentage score for each domain will be averaged together to generate a final overall quality score for each ACO that will be used to determine the amount of savings it shares or, if applicable, the amount of losses it owes.

<https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/MSSP-QM-Benchmarks-2016.pdf>

Medicaid

The Department of Vermont Health Access (DVHA) and OCV have entered into a contract for the Vermont Medicaid Next Generation program for the 2017 calendar year. Controlling High Blood Pressure is one of ten, out of 12 payment measures specified in the contract. An ACO's performance is based on these payment measures which will impact the distribution of funds from a quality incentive pool established by the ACO under the terms of the contract. OCV can earn up to two points per payment measure (including Controlling High Blood Pressure) for the ACO's performance relative to national or multi-state benchmarks, up to a total of 20 points. Quality points are aggregat-

ed across measures to obtain the ACO's quality score. The quality score corresponds to the proportion of funds available for allocation to network providers – the share for the incentive pool in 2017 is 0.5%. Any portion of incentive pool funds not distributed to network providers based on their quality scores shall be reinvested into ongoing quality improvement initiatives using an approach mutually agreed upon by OCV and DVHA.

Commercial

Blue Cross Blue Shield of Vermont has entered into agreements for Commercial Shared Savings Programs in 2017 with OCV and CHAC. The State's understanding is that the Controlling High Blood Pressure measure is included in the payment measure set in both agreements, quality points are awarded by measure based on how the ACO performs relative to the national benchmark, and a quality score is determined by aggregating points for all payment measures. The aggregate quality score determines how much shared savings, if any, the ACO receives.

Blueprint Community Health Team (CHT) Payments and Patient-Centered Medical Home (PCMH) Payments

In Vermont, primary care providers and their practice can receive two Per Patient Per Month (PPPM) incentive payments: 1) to employ community health team (CHT) members; and 2) to implement continuous quality improvement related to the National Committee for Quality Assurance (NCQA) Patient Centered Medical Home (PCMH) standards.

The CHT payments are based on high performance on four quality measures. The 2017 quality measures are:

1. Adolescent Well-Care Visits
2. Developmental Screening in the First Three Years of Life

3. Diabetes Poor Control, HbA1c>9%
4. PQI 91 – Chronic Condition Composite

Starting in 2018, one of the four quality measures will be NQF 18, controlling hypertension. Practices who show relative improvement, performance in the top 50th percentile, or performance in the top 90th percentile receive points towards an increased PPPM.

The PCMH payments are based on NCQA PCMH recognition. The NCQA PCMH Standards supports implementing the key interventions identified in the hypertension management toolkit. Key strategies, such as implementing evidence-based guidelines, developing a hypertension panel, providing patient education, promoting self-management through tools and community resources, and measuring the percent of individuals with hypertension that have controlled blood pressure, are factors in the PCMH standards.

The six NCQA PCMH standards are:

1. Enhance access and continuity
2. Team-based care
3. Population health management
4. Plan and manage care
5. Track and coordinate care
6. Measure and improve performance

Appendices



A: Practice Readiness Assessment	57
B: A3 Template	59
C: NQF 18 Measure Specification	62
D: Team Member Template	69
E: Sample Agendas for Team Meetings	70
F: AMA Process Map Toolkit	78
G: Cause and Effect Diagram	83
H: Hypertension Order Set Checklist	85
I: Vendor Engagement Strategies	86
J: Workflow Background and Knowledge Area Primer	87
K: Data Element Capture Template	89
L: CDS Intervention Rating Scale	92
M: AMA Tips for Accurate Blood Pressure Reading	94
N: Blood Pressure Log Template	95
O: Sample Blood Pressure Log	96
P: Implementation Plan Template	97
Q: Implementation Plan Sample	98

Practice Readiness Assessment (Appendix A)

Practice	
Project	
Name (optional)	Date

Instructions: Circle one answer in response to each statement below, based on how you view your practice. The rating scale ranges from 1 (Strongly Disagree) to 5 (Strongly Agree).

	1 Strongly Disagree	2	3	4	5 Strongly Agree
Perceptions					

1. Our process for hypertension needs improvement.
2. Our primary care hypertension visit process either doesn't exist or needs improvement.
3. Our pre-visit planning process either doesn't exist or needs improvement.
4. Our process for maintaining continuity of care with uncontrolled hypertensive patients needs improvement.

Methods of Change

5. The providers in our practice are willing to use a structured process to plan and change the way the practice manages hypertension.
6. The practice is able to support one-two clinicians and two staff in about 8-12 hours of team meetings together.
7. The practice has a provider leader who will share information with other providers and champion the results of the team's work.

Managing Change

8. Our practice is currently able to avoid being distracted or overwhelmed by competing demands (such as other big projects) or financial concerns.

Motivation

9. Providers are generally dissatisfied with the way hypertension care is managed in the practice.
10. I personally think that changing the way we manage hypertension care is the right thing to do in our practice now.

Issues/questions that should be addressed before starting on this project:

A3 Template (Appendix B)

Practice
Project
Date

Instructions: Use the following current/future state template and recording sheet.
(Note: Both are formatted to an 11x17 page size).

CURRENT STATE

FUTURE STATE



CURRENT STATE

TITLE

TEAM; Stage 1 Step 1.4:

Team Members: _____ Meeting Dates/Times: _____

BACKGROUND; Stage 1, Step 1.3:

Ask: What do we already know about the issue? List the answers, including the patient's perspective.

BACKGROUND/CURRENT STATE; Stage 2 Step 2.2:

Describe the current process for caring for a patient with hypertension. Make a list of each step in the process grouping together all tasks done by one job function (receptionist, medical assistant, nurse, provider, etc.). Describe clearly the tasks involved in each process step, including what happens with the patient's information, so everyone shares a complete understanding.

See the process from the patient's perspective and map the step-by-step activities to visually represent the path taken by a typical patient and the care team, from arrival at the office or telephone call to medication choices, referrals, and follow-up care. Be sure to include any steps that are outside of the visit, including calls to the patient.

The resulting diagram will assist the team in visualizing the order of patient flow and perhaps also in discovering flaws, bottlenecks, or gaps in care.

ANALYSIS OR DRIVERS; Stage 2 Step 2.3:

For each step or space with a long delay, ask:	For each step missing, incomplete, or inaccurate data, or materials, ask:
<p>1. How long did it take to complete this step?</p> <p>2. What was the reason for the delay?</p> <p>3. How did you manage the delay?</p> <p>4. What resources were used to manage the delay?</p> <p>5. How did the delay affect the overall project?</p> <p>6. How did you communicate the delay to the team?</p> <p>7. How did you communicate the delay to the stakeholders?</p> <p>8. How did you communicate the delay to the customer?</p> <p>9. How did you communicate the delay to the management?</p> <p>10. How did you communicate the delay to the board?</p>	<p>1. How did you ensure the data was accurate?</p> <p>2. How did you ensure the data was complete?</p> <p>3. How did you ensure the data was up-to-date?</p> <p>4. How did you ensure the data was consistent?</p> <p>5. How did you ensure the data was reliable?</p> <p>6. How did you ensure the data was valid?</p> <p>7. How did you ensure the data was trustworthy?</p> <p>8. How did you ensure the data was credible?</p> <p>9. How did you ensure the data was believable?</p> <p>10. How did you ensure the data was plausible?</p>

Why? Why?

Why? Why?

Why? Why?

Why? Why?

Why? Why?

FUTURE STATE

COUNTERMEASURES/ STRATEGIES; Stage 2 Step 2.4:

For each delay or missing, incomplete, or inaccurate item, consider:	Look at new strategies adopted in the literature or by exemplar practices:
<p>1. How can we ensure that the data is accurate and complete?</p> <p>2. How can we ensure that the data is timely and relevant?</p> <p>3. How can we ensure that the data is accessible and usable?</p> <p>4. How can we ensure that the data is secure and protected?</p> <p>5. How can we ensure that the data is transparent and accountable?</p> <p>6. How can we ensure that the data is ethical and responsible?</p> <p>7. How can we ensure that the data is inclusive and equitable?</p> <p>8. How can we ensure that the data is sustainable and resilient?</p> <p>9. How can we ensure that the data is innovative and transformative?</p> <p>10. How can we ensure that the data is collaborative and participatory?</p>	<p>1. How can we ensure that the data is accurate and complete?</p> <p>2. How can we ensure that the data is timely and relevant?</p> <p>3. How can we ensure that the data is accessible and usable?</p> <p>4. How can we ensure that the data is secure and protected?</p> <p>5. How can we ensure that the data is transparent and accountable?</p> <p>6. How can we ensure that the data is ethical and responsible?</p> <p>7. How can we ensure that the data is inclusive and equitable?</p> <p>8. How can we ensure that the data is sustainable and resilient?</p> <p>9. How can we ensure that the data is innovative and transformative?</p> <p>10. How can we ensure that the data is collaborative and participatory?</p>

A standard method that everyone agrees to

Clinical strategies

Visually easy signals

Operational strategies

New roles for staff

Financial strategies

Updated reward and recognition systems

Select those that can be included in the new process

Improved work place layout

at this time

FUTURE STATE; Stage 2 Step 2.5:

Draw the steps horizontally.

Identify the new changes or strategies used in each step.

Identify practice-specific resources needed (e.g. changes to IT system)

IMPLEMENTATION PLAN; Stage 2 Step 2.6:

Test of Change	Start Date	Who	Scope	Due Date	Status	Measure of Success
----------------	------------	-----	-------	----------	--------	--------------------

SUSTAINABILITY PLAN/ ACT; Stage 3 Steps 3.1 and 3.w2:

What (Implementation Milestones)	Who (Name)	When (Due Date)
----------------------------------	------------	-----------------

1.

2.

3.

NQF 18 Measure Specification (Appendix C)

Measure #236 (NQF 0018): Controlling High Blood Pressure – National Quality Strategy Domain: Effective Clinical Care

2016 PQRS OPTIONS FOR INDIVIDUAL MEASURES: CLAIMS, REGISTRY

DESCRIPTION:

Percentage of patients 18 through 85 years of age who had a diagnosis of hypertension and whose blood pressure was adequately controlled (< 140/90 mmHg) during the measurement period

INSTRUCTIONS:

This measure is to be reported a minimum of once per reporting period for patients with hypertension seen during the reporting period. The performance period for this measure is 12 months. The most recent quality code submitted will be used for performance calculation. This measure may be reported by clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding.

NOTE: *In reference to the numerator element, only blood pressure readings performed by a clinician in the provider office are acceptable for numerator compliance with this measure. Do not include blood pressure readings that meet the following criteria:*

- *Blood pressure readings from the patient's home (including readings directly from monitoring devices).*
- *Taken during an outpatient visit which was for the sole purpose of having a diagnostic test or surgical procedure performed (e.g., sigmoidoscopy, removal of a mole).*
- *Obtained the same day as a major diagnostic or surgical procedure (e.g., stress test, administration of IV contrast for a radiology procedure, endoscopy).*

If no blood pressure is recorded during the measurement period, the patient's blood pressure is assumed "not controlled".

Measure Reporting via Claims:

ICD-10-CM diagnosis codes, CPT or HCPCS code, and patient demographics are used to identify patients who are included in the measure's denominator. Quality-data codes are used to report the numerator of the measure.

When reporting the measure via claims, submit the listed ICD-10-CM diagnosis codes, CPT or HCPCS codes and the appropriate quality-data code. The reporting modifier allowed for this measure is: 8P- reason not otherwise specified. All measure-specific coding should be reported on the claim(s) representing the eligible encounter.

Measure Reporting via Registry:

ICD-10-CM diagnosis codes, CPT or HCPCS codes, and patient demographics are used to identify patients who are included in the measure's denominator. The listed numerator options are used to report the numerator of the measure.

The quality-data codes listed do not need to be submitted for registry-based submissions; however, these codes may be submitted for those registries that utilize claims data.

DENOMINATOR:

Patients 18 through 85 years of age who had a diagnosis of essential hypertension within the first six months of the measurement period or any time prior to the measurement period

Denominator Criteria (Eligible Cases):

Patients 18 through 85 years of age on date of encounter

AND

Diagnosis for hypertension (ICD-10-CM): I10

AND

Patient encounter during reporting period (CPT or HCPCS): 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350, G0402, G0438, G0439

NUMERATOR:

Patients whose blood pressure at the most recent visit is adequately controlled (systolic blood pressure < 140 mmHg and diastolic blood pressure < 90 mmHg) during the measurement period

Numerator Instructions: To describe both systolic and diastolic blood pressure values, **each must be reported separately**. If there are multiple blood pressures on the same date of service, use the lowest systolic and lowest diastolic blood pressure on that date as the representative blood pressure.

Numerator Quality-Data Coding Options for Reporting Satisfactorily:

Most Recent Blood Pressure Measurement Performed

Systolic pressure (***Select one (1) code from this section:***)

Performance Met: G8752: Most recent systolic blood pressure < 140 mmHg

OR

Performance Not Met: G8753: Most recent systolic blood pressure ≥ 140 mmHg

AND

Diastolic pressure (***Select one (1) code from this section:***)

Performance Met: G8754: Most recent diastolic blood pressure < 90 mmHg

OR

Performance Not Met: G8755: Most recent diastolic blood pressure ≥ 90 mmHg

OR

Patient not Eligible for Recommended Blood Pressure Parameters for Documented Reasons

Other Performance Exclusion: G9231: Documentation of end stage renal disease (ESRD), dialysis, renal transplant or pregnancy.

OR

Blood Pressure Measurement not Documented, Reason not Given

Performance Not Met: G8756: No documentation of blood pressure measurement, reason not given

RATIONALE:

Hypertension is a very significant health issue in the United States. Fifty million or more Americans have high blood pressure that warrants treatment, according to the National Health and Nutrition Examination Survey (NHANES) survey (Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure 2003). The United States Preventive Services Task Force (USPSTF) recommends that clinicians screen adults aged 18 and older for high blood pressure (United States Preventive Services Task Force 2007).

The most frequent and serious complications of uncontrolled hypertension include coronary heart disease, congestive heart failure, stroke, ruptured aortic aneurysm, renal disease, and retinopathy. The increased risks of hypertension are present in individuals ranging from 40 to 89 years of age. For every 20 mmHg systolic or 10 mmHg diastolic increase in blood pressure, there is a doubling of mortality from both ischemic heart disease and stroke (Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure 2003).

Better control of blood pressure has been shown to significantly reduce the probability that these undesirable and costly outcomes will occur. The relationship between the measure (control of hypertension) and the long-term clinical

outcomes listed is well established. In clinical trials, antihypertensive therapy has been associated with reductions in stroke incidence (35-40 percent), myocardial infarction incidence (20-25 percent) and heart failure incidence (>50 percent) (Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure 2003).

CLINICAL RECOMMENDATION STATEMENTS:

The United States Preventive Services Task Force (2007) recommends screening for high blood pressure in adults age 18 years and older. This is a grade A recommendation.

Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (2003):

Treating systolic blood pressure and diastolic blood pressure to targets that are < 140/90 mmHg is associated with a decrease in cardiovascular disease complications.

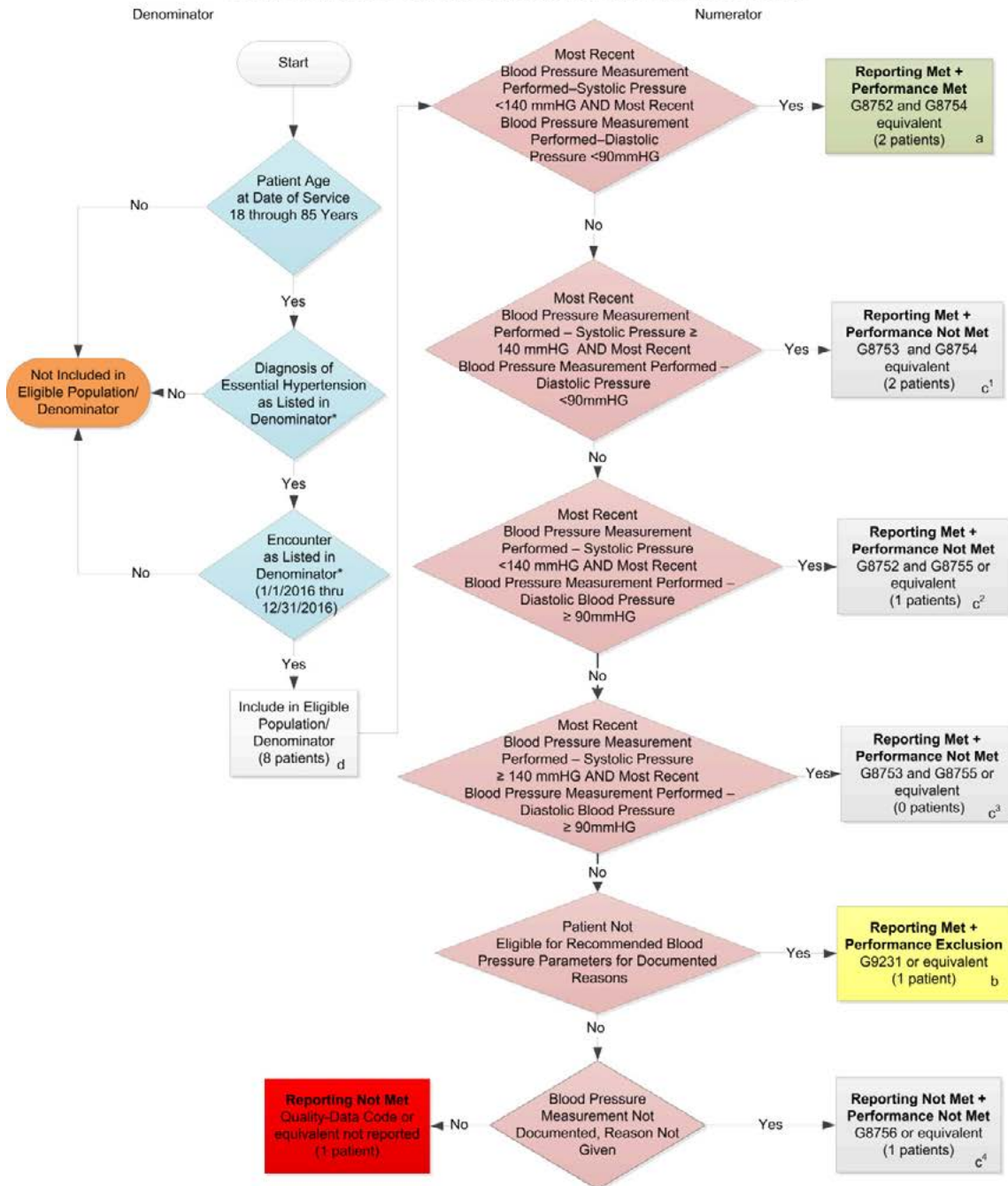
COPYRIGHT:

These performance measures were developed and are owned by the National Committee for Quality Assurance ("NCQA"). These performance measures are not clinical guidelines and do not establish a standard of medical care. NCQA makes no representations, warranties, or endorsement about the quality of any organization or physician that uses or reports performance measures and NCQA has no liability to anyone who relies on such measures. NCQA holds a copyright in this measure and can rescind or alter this measure at any time. Users of the measure shall not have the right to alter, enhance, or otherwise modify the measure and shall not disassemble, recompile, or reverse engineer the source code or object code relating to the measure. Anyone desiring to use or reproduce the measure without modification for a noncommercial purpose may do so without obtaining any approval from NCQA. All commercial uses must be approved by NCQA and are subject to a license at the discretion of NCQA. Use by health care providers in connection with their own practices is not commercial use. A "commercial use" refers to any sale, license, or distribution of a measure for commercial gain, or incorporation of a measure into any product or service that is sold, licensed, or distributed for commercial gain, even if there is no actual charge for inclusion of the measure. ©2004-2016 National Committee for Quality Assurance, all rights reserved.

Performance measures developed by NCQA for CMS may look different from the measures solely created and owned by NCQA.

CPT® contained in the Measures specifications is copyright 2004-2013 American Medical Association.

**2016 Claims/Registry Individual Measure Flow
PQRS #236 NQF #0018: Controlling High Blood Pressure**



SAMPLE CALCULATIONS:	
Reporting Rate=	
$\frac{\text{Performance Met (a = 2 patients)} + \text{Performance Exclusion (b = 1 patient)} + \text{Performance Not Met (c¹ + c² + c³ + c⁴ = 4 patients)}}{\text{Eligible Population / Denominator (d = 8 patients)}} = \frac{7 \text{ patients}}{8 \text{ patients}} = 87.50\%$	
Performance Rate=	
$\frac{\text{Performance Met (a = 2 patients)}}{\text{Reporting Numerator (7 patients) - Performance Exclusion (b = 1 patient) = 6 patients}} = \frac{2 \text{ patients}}{6 \text{ patients}} = 33.33\%$	

*See the posted Measure Specifications for specific coding and instructions to report this measure.

NOTE: Reporting Frequency: Patient-Intermediate

CPT only copyright 2015 American Medical Association. All rights reserved.
The measure diagrams were developed by CMS as a supplemental resource to be used in conjunction with the measure specifications. They should not be used alone or as a substitution for the measure specification.

v2

2016 Claims/Registry Individual Measure Flow
PQRS #236 NQF #0018: Controlling High Blood Pressure

Please refer to the specific section of the Measure Specification to identify the denominator and numerator information for use in reporting this Individual Measure.

1. Start with Denominator
2. Check Patient Age:
 - a. If the Age is equal to 18 thru 85 years of age on Date of Service equals No during the measurement period, do not include in Eligible Patient Population. Stop Processing.
 - b. If the Age is equal to 18 thru 85 years of age on Date of Service equals Yes during the measurement period, proceed to check Patient Diagnosis.
3. Check Patient Diagnosis:
 - a. If Diagnosis of Essential Hypertension as Listed in the Denominator equals No, do not include in Eligible Patient Population. Stop Processing.
 - b. If Diagnosis of Essential Hypertension as Listed in the Denominator equals Yes, proceed to check Encounter Performed.
4. Check Encounter Performed:
 - a. If Encounter as Listed in the Denominator equals No, do not include in Eligible Patient Population. Stop Processing.
 - b. If Encounter as Listed in the Denominator equals Yes, include in the Eligible population.
5. Denominator Population:
 - a. Denominator population is all Eligible Patients in the denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 8 patients in the sample calculation.
6. Start Numerator
7. Check Most Recent Blood Pressure Measurement Performed - Systolic Pressure <140 mmHG AND Most Recent Blood Pressure Measurement Performed -Diastolic Pressure <90 mmHG:
 - a. If Most Recent Blood Pressure Measurement Performed - Systolic Pressure <140 mmHG AND Most Recent Blood Pressure Measurement Performed -Diastolic Pressure <90 mmHG equals Yes, include in Reporting Met and Performance Met.
 - b. Reporting Met and Performance Met letter is represented in the Reporting Rate and Performance Rate in the Sample Calculation listed at the end of this document. Letter a1 equals 2 patients in Sample Calculation.
 - c. If Most Recent Blood Pressure Measurement Performed - Systolic Pressure <140 mmHG AND Most Recent Blood Pressure Measurement Performed -Diastolic Pressure <90 mmHG equals No, proceed to Most Recent Blood Pressure Measurement Performed- Systolic Pressure ≥140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure <90 mmHG.

8. Check Most Recent Blood Pressure Measurement Performed- Systolic Pressure ≥ 140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure < 90 mmHG:
 - a. If Most Recent Blood Pressure Measurement Performed- Systolic Pressure ≥ 140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure < 90 mmHG equals Yes, include in Reporting Met and Performance Not Met.
 - b. Reporting Met and Performance Not Met letter is represented in the Reporting Rate in the Sample Calculation listed at the end of this document. Letter c1 equals 2 patients in the Sample Calculation.
 - c. If Most Recent Blood Pressure Measurement Performed- Systolic Pressure ≥ 140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure < 90 mmHG equals No, proceed to Most Recent Blood Pressure Measurement Performed- Systolic Pressure < 140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure ≥ 90 mmHG.
9. Check Most Recent Blood Pressure Measurement Performed- Systolic Pressure < 140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure ≥ 90 mmHG:
 - a. If Most Recent Blood Pressure Measurement Performed- Systolic Pressure < 140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure ≥ 90 mmHG equals Yes, include in Reporting Met and Performance Not Met.
 - b. Reporting Met and Performance Not Met letter is represented in the Reporting Rate in the Sample Calculation listed at the end of this document. Letter c2 equals 1 patient in the Sample Calculation.
 - c. If Most Recent Blood Pressure Measurement Performed- Systolic Pressure < 140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure ≥ 90 mmHG equals No, proceed to Most Recent Blood Pressure Measurement Performed- Systolic Pressure ≥ 140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure ≥ 90 mmHG.
10. Check Most Recent Blood Pressure Measurement Performed- Systolic Pressure ≥ 140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure ≥ 90 mmHG:
 - a. If Most Recent Blood Pressure Measurement Performed- Systolic Pressure ≥ 140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure ≥ 90 mmHG equals Yes, include in Reporting Met and Performance Not Met.
 - b. Reporting Met and Performance Not Met letter is represented in the Reporting Rate in the Sample Calculation listed at the end of this document. Letter c3 equals 0 patient in the Sample Calculation.
 - c. If Most Recent Blood Pressure Measurement Performed- Systolic Pressure ≥ 140 mmHG AND Most Recent Blood Pressure Measurement Performed- Diastolic Pressure ≥ 90 mmHG equals No, proceed to Patient Not Eligible for Recommended Blood Pressure Parameters for Documented Reasons.

11. Check Patient Not Eligible for Recommended Blood Pressure Parameters for Documented Reasons:
 - a. If Patient Not Eligible for Recommended Blood Pressure Parameters for Documented Reasons equals Yes, include in the Reporting Met and Performance Exclusion.
 - b. Reporting Met and Performance Exclusion letter is represented in the Reporting Rate and Performance Rate in the Sample Calculation listed at the end of this document. Letter b equals 1 patient in the Sample Calculation.
 - c. If Patient Not Eligible for Recommended Blood Pressure Parameters for Documented Reasons equals No, proceed to Blood Pressure Measurement Not Documented, Reason Not Given.
12. Check Blood Pressure Measurement Not Documented, Reason Not Given:
 - a. If Blood Pressure Measurement Not Documented, Reason Not Given equals Yes, include in the Reporting Met and Performance Not Met.
 - b. Reporting Met and Performance Not Met letter is represented in the Reporting Rate in the Sample Calculation listed at the end of this document. Letter c4 equals 1 patient in the Sample Calculation.
 - c. If Blood Pressure Measurement Not Documented, Reason Not Given equals No, proceed to Reporting Not Met.
13. Check Reporting Not Met
 - a. If Reporting Not Met equals No, Quality Data Code or equivalent was not reported. 1 patient has been subtracted from the reporting numerator in the sample calculation.

SAMPLE CALCULATIONS:

Reporting Rate=

$$\frac{\text{Performance Met (a =2 patients) + Performance Exclusion (b=1 patient) + Performance Not Met (c}^1\text{+c}^2\text{+c}^3\text{+c}^4\text{=4 patients)}}{\text{Eligible Population / Denominator (d=8 patients)}} = \frac{7 \text{ patients}}{8 \text{ patients}} = 87.50\%$$

Performance Rate=

$$\frac{\text{Performance Met (a=2 patients)}}{\text{Reporting Numerator (7 patients) - Performance Exclusion (b=1 patient) = 6 patients}} = \frac{2 \text{ patients}}{6 \text{ patients}} = 33.33\%$$

Team Member Template (Appendix D)

Position	Responsibilities	Name of Person in the Practice Who Will Assume Role
<p>Physician Champion</p> <p><i>Examples: Medical Director, Physician</i></p>	Someone with authority to test and implement the change and to deal with issues that arise.	
<p>Clinical Technical Expert</p> <p><i>Examples: Physician, Nurse</i></p>	Someone who knows the subject intimately and who understands the processes of care.	
<p>QI Technical Expert</p> <p><i>Examples: Practice Facilitator or Health Care Consultant</i></p>	Someone with knowledge of improvement methods and can help the team determine what to measure, assist in design of simple, effective measurement tools, and provide guidance on collection, interpretation, and display of data.	
<p>Day-to-Day Leadership</p> <p><i>Examples: Physician, Nurse, Practice Manager</i></p>	This is the driver of the project, who assures tests are implemented and oversees data collection, understands not only the details of the system, but also the various effects of making change(s) in the system. Works effectively with the physician champion(s).	
<p>Project Sponsor</p> <p><i>Examples: Chief Medical Officer or Chief Operating Officer, Medical Director</i></p>	Someone with executive authority who can provide liaison with other areas of the organization, serve as a link to senior management and the strategic aims of the organization, provide resources and overcome barriers on behalf of the team, and provide accountability for the team members.	
<p>Patient and/or Family Representative</p>	Someone who is receiving treatment for hypertension and is willing to attend meetings when requested.	

Sample Agendas for Team Meetings (Appendix E)

Practice	
Participant Names	
Date	Time

Hypertension Management QI Planning

SESSION 1 AGENDA

- 1. Introduction (as needed)**
- 2. Purpose of this Quality Improvement (QI) project**
 - Generally: hypertension management
- 3. The QI process (how the project works)**
 - Who is involved
 - › Practice members
 - › Non-practice members
 - How long it will take
 - › Sources of data, especially EHR
 - › Survey for all providers and staff – email or paper surveys
- 4. Background**
- 5. Current State**
- 6. Next steps**
 - Email addresses for practice members
 - Communication: Who needs to know what and when
 - Next meeting:

Practice	
Participant Names	
Date	Time

Hypertension Management QI Planning

SESSION 2 AGENDA

Topic	Leader	Time
1. Start Up		
• Re-introduction for new team members	Leader	5 min
• Questions since last meeting?	Facilitator	5 min
2. Review: Issue and Background	Facilitator	5 min
Conversation with two patients from the practice who have been diagnosed with Hypertension. This is a learning and listening exercise, not a time for team talking. Questions that may be used to prompt patient conversation:		
• How long have you been coming to the practice? (ice breaker question)		
• We are trying to improve the way we manage hypertension. Is there anything we could do (could have done) to make the process easier for you?		
• Do you have any advice for us?		
3. Current State and measures	Group	30 min
4. Problem Identification	Group	15 min
5. Plan for Next Meeting	Facilitator	5 min
6. Adjourn	Leader	

Practice
Participant Names
Date

Time

Hypertension Management QI Planning

SESSION 3 AGENDA

Topic	Leader	Time
1. Start Up	Leader	5 min
2. Review Current State and Measures	Group	5 min
3. Problem Identification	Group	15 min
4. Best Practice Strategies <ul style="list-style-type: none"> Action Items: Next Meeting: 	Facilitator	20 min
5. Adjourn	Leader	

Practice
Participant Names
Date

Time

Hypertension Management QI Planning

SESSION 4 AGENDA

Topic	Leader	Time
1. Start Up	Leader	5 min
2. Review Problem Identification	Group	5 min
3. Discuss Best Practice Strategies	Group	30 min
4. Opportunities & Future State	Group	15 min
5. Plan for Next Step	Facilitator	5 min
6. Measures		
7. Next Meeting:		
8. Adourn		

Practice
Participant Names
Date

Time

Hypertension Management QI Planning

SESSION 5 AGENDA

Topic	Leader	Time
1. Start Up	Leader	5 min
2. Review Future State	Facilitator	5 min
3. Update Implementation Plan <ul style="list-style-type: none"> How will you know if the plan is successful? 	Group	30 min
4. Final Review of Strategies <ul style="list-style-type: none"> Add to Implementation Plan What If Scenarios 	Facilitator	15 min
5. Next Steps <ul style="list-style-type: none"> Future meetings Plan for follow up survey 	Facilitator	5 min
6. Adjourn	Leader	

Practice
Participant Names
Date

Time

Hypertension Management QI Planning

SESSION 6 AGENDA

Topic	Leader	Time
1. Start Up	Leader	5 min
2. Review and Complete Future State	Facilitator	15 min
3. Measures	Group	10 min
4. Implementation Plan	Group	10 min
5. Next Meeting:	Facilitator	
6. Adourn	Leader	

Practice	
Participant Names	
Date	Time

Hypertension Management QI Planning

SESSION 7 AGENDA

Topic	Leader	Time
1. Start Up	Leader	5 min
2. Review Future State	Facilitator	5 min
3. Update Implementation Plan <ul style="list-style-type: none"> How will you know if the plan is successful? 	Group	30 min
4. Final Review of Strategies <ul style="list-style-type: none"> Add to Implementation Plan 	Facilitator	15 min
5. Next Steps <ul style="list-style-type: none"> Future meetings Plan for follow up survey 	Facilitator	
6. Adjourn	Leader	

Practice	
Participant Names	
Date	Time

Hypertension Management QI Planning

SESSION 8 AGENDA

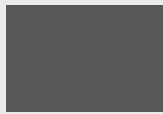
Topic	Leader	Time
1. Start Up	Leader	5 min
2. Update Implementation Plan	Facilitator	20 min
3. Measures <ul style="list-style-type: none"> • Plan for follow up survey? 	Group	10 min
4. Additional Issues <ul style="list-style-type: none"> • Add to Implementation Plan 	Facilitator	20 min
5. Next Steps <ul style="list-style-type: none"> • Future meetings • Plan for follow up survey – when? 	Facilitator	5 min
6. Adjourn	Leader	

PROCESS MAP TOOLKIT



MOST COMMON PROCESS MAP SYMBOLS

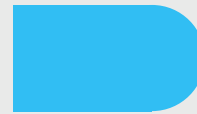
Which symbols should you use? Most process maps can be created using a few basic flowchart symbols. Here are some common symbols and their meanings. To create your own map, copy and paste these symbols into a new slide.



Process represents a step or activity in your process.



Terminal points indicate the starting or ending points of a process.



Delay represents a waiting period where no value-added activity takes place.



Decision indicates a point where the outcome of a decision dictates the next step. There can be multiple outcomes, but often there are just two - yes and no.



Document represents a step that requires or results in a document.



Kaizen bursts indicate improvement opportunities.



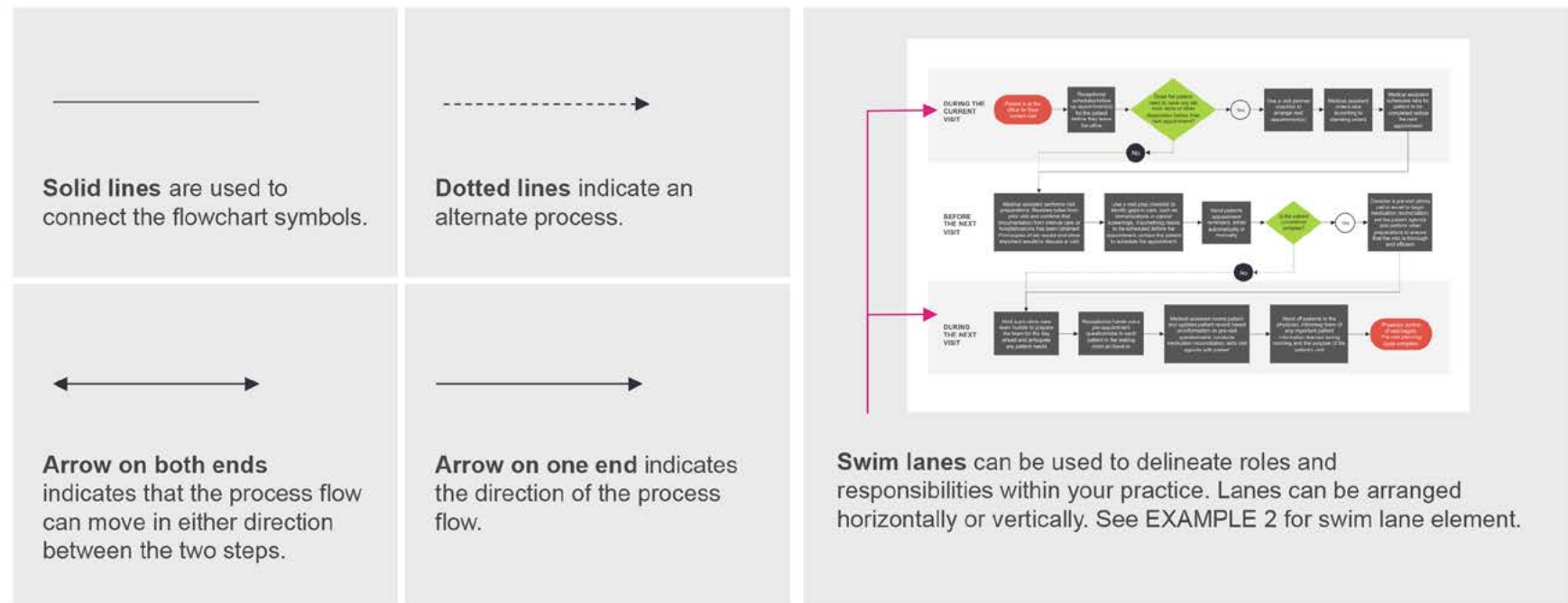
Preparation indicates an action that helps prepare for the next step in the process.



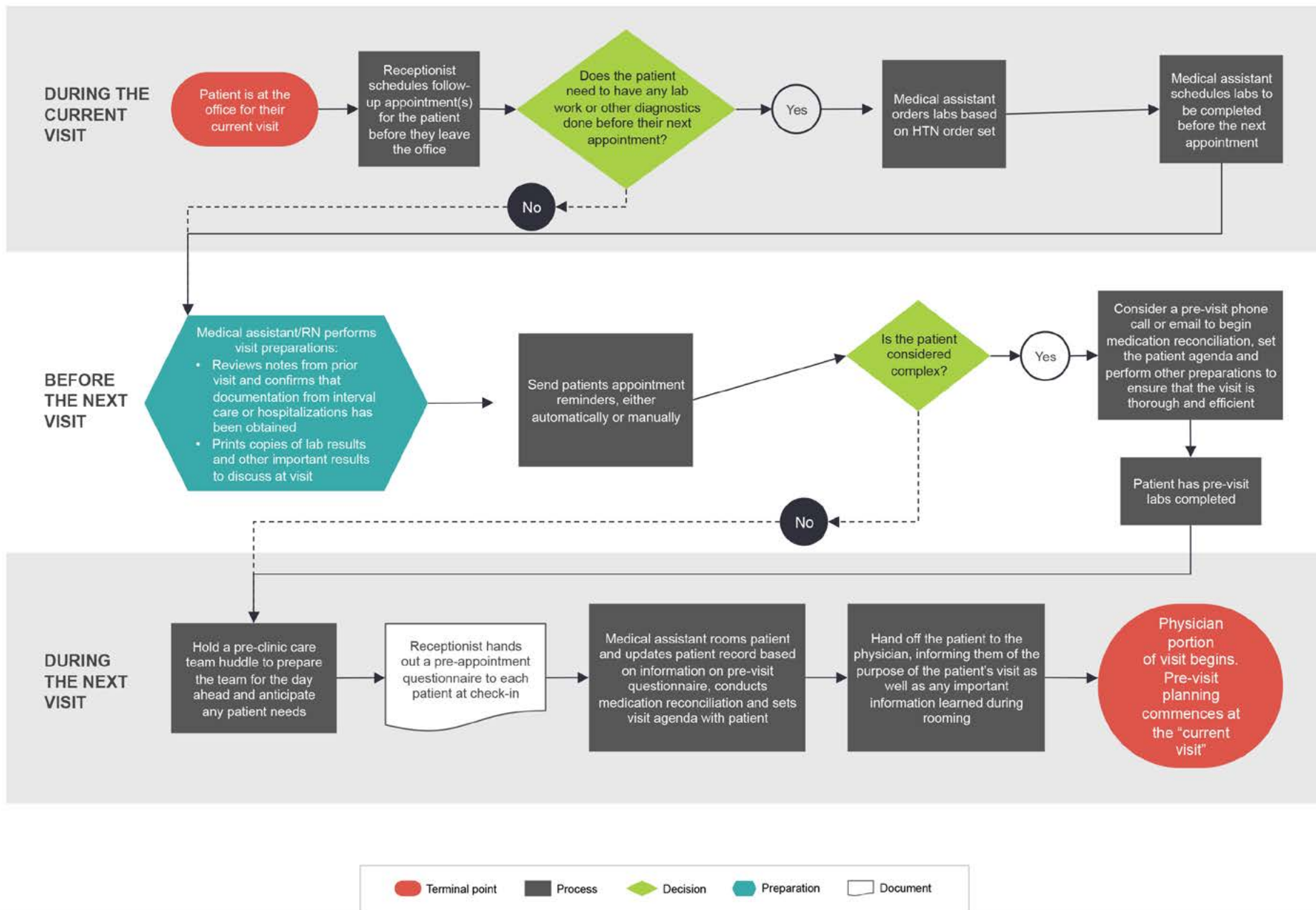
Manual operation indicates an operation or adjustment to the process that can be made manually.

CONNECTORS

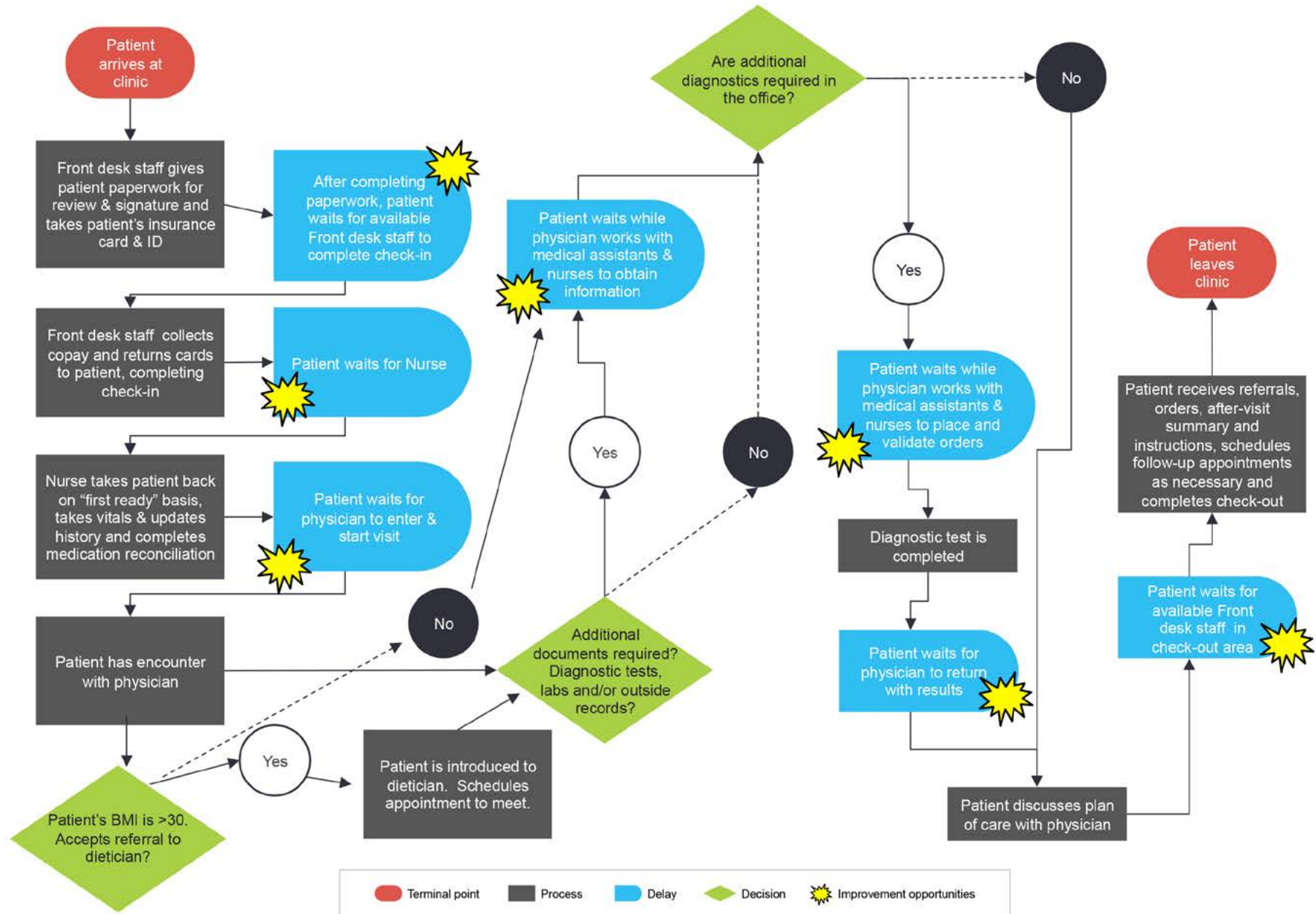
Connectors are lines that link different flowchart symbols. Once placed, connectors will stay connected to the symbols they are linked to. Move linked symbols and their connectors will automatically reorient with them.



PRE-VISIT PLANNING PROCESS EXAMPLE WITH SWIM LANES



EXAMPLE 1: PATIENT WAIT TIME PROCESS FLOW



Cause and Effect Diagram (Appendix G)

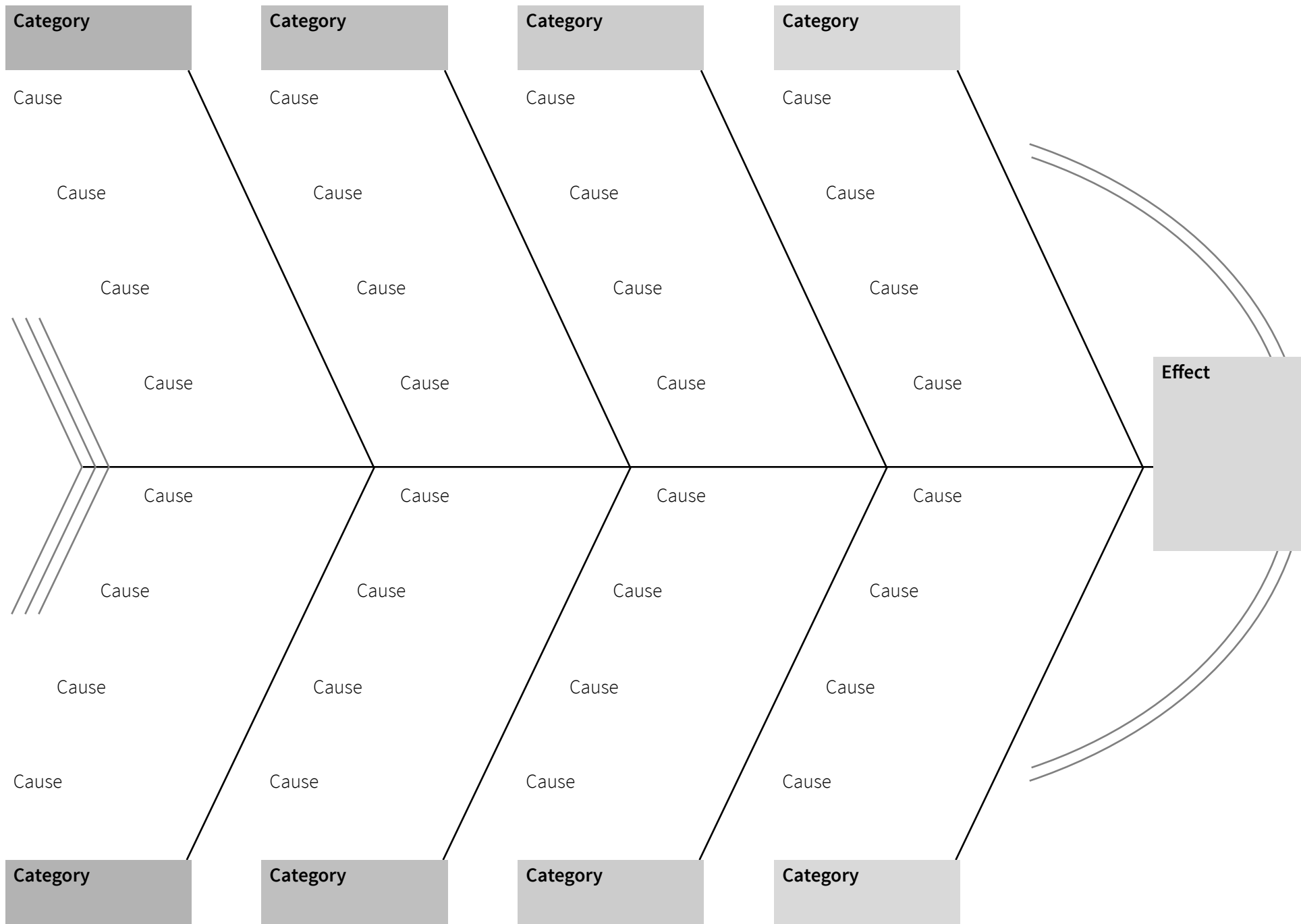
Practice

Project

Date

Instructions: Consider drawing your fish on a flip chart or white board. Then, as a team, carry out the steps listed below. Make sure to leave enough space between the major categories on the diagram so you can add minor detailed causes later.

1. Agree on the problem statement (also referred to as the effect). This is written at the mouth of the fish. Be as clear and specific as you can about the problem. In this case, the problem is likely, *Insufficient Hypertension Control*.
2. Agree on the major categories of influence (written as the bones of the main arrow). For the purpose of hypertension control, these arms might be labeled as *Treatment, Patient, Medical Staff, Documentation, Measurement, and Environment*.
3. Brainstorm all the possible causes of the problem. Ask “Why does this happen?” As each idea is given, the facilitator writes the causal factor as a branch from the appropriate category. In this case, causes may be *no one person to focus on HTN, high copays for medication, poor information flow between primary care and specialist, or inaccurate blood pressure measurement*.
4. Again ask, “why does this happen?” about each cause. Write sub-causes branching off the main cause branches
5. Continue to ask, “why?” and generate deeper levels of causes and continue organizing them under related causes or categories.
6. You might have team members write each cause on a sticky note, going around the room asking each person for one cause. Continue going through the rounds, getting more causes, until all ideas are exhausted.



Hypertension Order Set Checklist (Appendix H)

Patient Name	
Next Appointment Date	Date of Last Annual Exam

Test	Interval	Condition
Office Visit	6 months	If BP controlled to <140/90
Office Visit	1 month	If BP >140/90
Lipid Profile	1 year	
Basic Metabolic Profile	1 year	
Urine Alb/Creat. Ratio	1 year	Patients with no Hx of Abn UACR
Urine Alb/Creat. Ratio	6 months	If UACR was ever >30

Complete these labs on all my patients with hypertension whenever the Standing Orders are due.

Signature

Date

Use this template to create your own checklist if you find it needs to be modified to meet the needs of your practice. Update the checklist based on your patient population and current guidelines before implementing. Practices are encouraged to use this as a guide to streamline electronic order entry and order sets in their electronic health record.

Vendor Engagement Strategies (Appendix I)

Consult with EMR system designers and vendors about ways CDS might help to improve your clinical goals and related objectives.¹

Finding the appropriate intervention(s) for a clinical goal can be challenging. For example, care of patients with diabetes normally entails managing a cluster of symptoms and physiological states. Improving care for these patients, then, may require focusing on a number of objectives including HbA1c testing, blood pressure monitoring, lipid management, patient education and behavior change, and so forth. Likewise, a cluster of CDS interventions may be needed to assist with each of these objectives, including various reminders and computer-based guidance for specific tests and procedures (e.g., foot/eye exams, HbA1c monitoring, blood pressure monitoring, LDL control, patient education). A conversation with your system

designer or your vendor can help to gauge what is available to achieve a clinical goal, what clinical objectives might be most appropriate, and how CDS interventions correspond to both.

Important in this discussion is determining the ability to customize a given CDS intervention to support local needs of end-users. For example, a practice or specialty within may want to change the value of then an alert “triggers” an alert. When thinking about types of CDS interventions, certain types of functionality or capabilities may have to be in place for rules to gain the functionality required to meet clinical goals and objectives—for example linkage between the laboratory and pharmacy systems. This type of consideration should be discussed with your vendor, and system redesign or complex reprogramming should be avoided as much as possible.

Questions for a Conversation with Your Vendor/Designer

What types of CDS interventions (relevant data display, alerts, reminders, etc) are available within the EMR system to address our clinical goals and objectives?

Within this cluster of interventions, which have been shown to have the most impact? Which are the easiest to turn on? Which are most likely to be accepted by end-users?

How can we configure and customize CDS interventions to suit our practice needs and workflow? Can we select specific alerts and reminders, or are the rules preset packages of alerts that can only be turned on or off wholesale?

Do we have the appropriate hardware and software to most effectively use CDS functionality?

Are there already CDS “components” that we can use, such as logic, rules templates, screen designs, interfaces?

Appendix I Reference

1. Osheroff, Teich, Levick et al., 2012. Improving outcomes with CDS: an implementer’s guide, Second Edition.

Workflow Background and Knowledge Area Primer (Appendix J)

Designation of Role-Based Access to Data

Role-based access to the data—sometimes referred to as create, read, update, and delete authority—must be defined, enforced, and built into system security functionality. Clear policies on the information access needed by a specific role or relationship to patient types must be developed. This is determined by the role and location of staff. Roles need to be identified and access provided based on the Health Insurance Portability and Accountability Act's (HIPAA) minimum necessary requirement, which states that staff should have access only to the information they need to do their job.

Creation of Data Dictionaries

A data dictionary exists for each information system, with standard data field definitions for each data element. These definitions should be clearly communicated to all staff accessing the record—especially those responsible for reporting EHR data. In addition, periodic validation of access must be in place. The data dictionary can also be built into system functionalities to ensure adherence on many levels. As an example, the distinction between ethnicity and race should be understood and consistently applied during the registration process. Selection options for these fields should be limited to choices that are in compliance with the data dictionary.

For all the systems that feed the EHR, clear policies, standards, procedures, and functionalities should be established to define who owns and has responsibility for maintaining and creating the data dictionary for each system and module. Having a single owner over the various dictionaries is helpful in reducing reporting errors. The consistent capture of key data is crucial.

Use of Standardized Formats To Ensure Consistency

A standardized format is used to ensure consistency. For example, to satisfy Meaningful Use requirements, the problem list is developed using the SNOMED format to record current, active, and past diagnoses. Format validation is another method to improve consistency. Data fields can be set to force users to enter dates as mm/dd/yyyy or assigned a reference range to warn users that certain values do not make sense for that field, such as a heart rate of 1000 beats per minute. In addition, the use of standardized templates, checklists, and online forms should be required to the greatest extent possible for provider and staff documentation. Many EHRs also allow configuration of a set of screens that walk the user through the most important documentation steps. These should be appropriate for the role and guide users to fill out the key data elements. This too can be built into the system's functionality but should be developed with the appropriate key stakeholders involved in the process.

Use of Structured Data

Use of structured data is important to enable the sharing and exchange of health information via HIEs with other organizations. For example, consider using structured fields for medication information such as route, dose, and frequency rather than entering this

information in a free-text instructions field. No matter what system body temperature or BP is entered into, the format is always the same and can be more easily shared across systems. If the information were entered as free text, the formatting might be lost and the information misinterpreted.

Systems can also use structured drop-down lists that can be customized or network to a larger file (e.g., a SNOMED database for diagnoses codes) to reduce the challenges associated with inconsistency because of free-text entry, such as by constraining a physician to select a frequency of “twice daily” rather than type “BID” when ordering a medication.

Careful Use of Item Requirements

Required items, sometimes called hard stops, prevent the user from advancing through documentation until required information has been input into system, such as a patient’s Social Security number during registration or preventing staff from marking a patient visit as “complete” or “closed” until missing information is entered. These items prevent users from missing important data elements but should be used judiciously and thoroughly tested to avoid negatively affecting user productivity. For example, if a user is unable to fill in a required field because of a unique patient situation, the system may prevent the user from advancing to other documentation.

Creation of Documentation Dashboards

Some organizations create dashboards in the system or on a computer screensaver that displays to staff or managers the status of key documentation elements for a particular patient. These can be related to missing or incomplete documentation or to a patient’s progress toward health goals.

Adherence to State and Federal Laws

State and federal laws and regulations; accreditation standards; medical staff bylaws, rules, and regulations; and organizational policies and procedures mirror standardization decisions and should be followed by providers and staff. The Joint Commission’s Information Management and Record of Care standards, HIPAA rules, CMS Conditions of Participation, and Federal Rules of Civil Procedure related to electronic discovery are just a few of the standards that should be kept in mind when developing standards and procedures.

Compliance with Data Integrity Policies and Procedures

Data integrity policies and procedures must be followed. These policies may apply to processes for new patient file creation, handling duplicate records, and addressing overlays because two patients have been assigned the same unique identifier. It is important to implement policies and procedures to maintain the integrity of the data throughout the patient encounter for all information entered into the EHR. Individuals dedicated to the continuous auditing and EHR correction processes, monitor the system proactively and correct errors as they are identified.

Appendix J Reference

1. <https://www.healthit.gov/sites/default/files/onc-beacon-lg3-ehr-data-quality-and-perform-impvt.pdf>

Data Element Capture Template (Appendix K)

Data Elements: Captured to report on NQF measure #18, Controlling Hypertension.

Numerator: The number of patients in the denominator whose most recent BP is adequately controlled during the measurement year. For a patient’s BP to be controlled, both the systolic and diastolic BP must be <140/90 (adequate control). To determine if a patient’s BP is adequately controlled, the representative BP must be identified.

Denominator: Patients 18 to 85 years of age by the end of the measurement year who had at least one outpatient encounter with a diagnosis of hypertension during the first six months of the measurement year.

Description: Define data element.

Performance: How frequently is the data in the appropriate field?

Location of Data in EHR: Where data can be found. Provide screenshot, when possible.

Structured Data Field? Can the data be extracted into a usable report?

Action Needed: Which data elements require action to correct?

#	Data Element Name (examples)	Description	Performance	Location of Data Field in EHR. Provide screenshot, when possible.	Structured Data Field? Able to be pulled into report via code or value?			Action Needed	
					Yes	No	Unsure	Yes	No
	Adult Outpatient Visit			Encounter					
	Annual Wellness Visit			Encounter					
	Chronic Kidney Disease, Stage 5			Condition/Diagnosis/ Problem					
	Dialysis Education			Intervention					
	Dialysis Services			Procedure					
	Diastolic Blood Pressure			Physical Exam					

#	Data Element Name (examples)	Description	Performance	Location of Data Field in EHR. Provide screenshot, when possible.	Structured Data Field? Able to be pulled into report via code or value?			Action Needed	
					Yes	No	Unsure	Yes	No
	ESRD Monthly Outpatient Services			Encounter					
	End Stage Renal Disease			Condition/Diagnosis/ Problem					
	Essential Hypertension			Condition/Diagnosis/ Problem					
	Ethnicity			Individual Characteristic					
	Face-to-Face Interaction			Encounter					
	Home Healthcare Services			Encounter					
	Kidney Transplant			Procedure					
	ONC Administrative Sex			Individual Characteristic					
	Office Visit			Encounter					
	Other Services Related to Dialysis			Intervention					
	Payer			Individual Characteristic					
	Pregnancy			Condition/Diagnosis/ Problem					

#	Data Element Name (examples)	Description	Performance	Location of Data Field in EHR. Provide screenshot, when possible.	Structured Data Field? Able to be pulled into report via code or value?			Action Needed	
					Yes	No	Unsure	Yes	No
	Preventive Care Services - Established Office Visit, 18 and Up			Encounter					
	Preventive Care Ser- vices-Initial Office Visit, 18 and Up			Encounter					
	Race			Individual Characteristic					
	Systolic and Diastolic Blood Pressure			Physical Exam					
	Vascular Access for Dialysis			Procedure					
	Smoking status								

CDS Intervention Rating Scale (Appendix L)

Instructions: As a group (the project team), prioritize the CDS interventions, based on your belief in the ease of implementation and effectiveness of resolving the problem. There are spaces at the bottom to add your own CDS interventions. There is no right or wrong answer.

- 1. Choose only one rating per strategy.
 - 1 – Simple and effective;** we should definitely do this.
 - 2 – Simple or effective;** we should possibly do this.
 - 3 – Much less simple or effective;** we should do this only after trying the others.
- 2. Begin with the CDS strategies that the team rated as “1” and then move onto the “2” rated strategies and so on.

#	CDS Intervention	Rating		
		1	2	3
	Use of the UpToDate® HL7 Infobutton to provide linked clinical decision support and patient information distribution. The Infobutton facilitates quick access to UpToDate tailored content based on your search query.			
	Hypertension treatment templates based on evidence-based clinical guidelines, including treatment by stage of hypertension and risk stratification			
	Suggestions and exclusions for medications based on concurrent medical conditions			
	Reminder of the underlying causes of nonessential or secondary hypertension			
	Indications for referral to a hypertensive specialist			
	Hypertension management templates with questions about self-care, weight, physical activity level, blood pressure monitoring, and salt intake			
	Prepopulated hypertension order sets, including preferred medications (generics, 90-day supplies)			
	Formularies are added to e-prescribing lists to help minimize patient out-of-pocket costs			
	Blood pressure medication default to 90-day supply to decrease patient time spent obtaining refills.			
	Medication refill review tool (such as the MMMA) to assess adherence			
	Prepopulated referrals for nutrition and/or behavioral health counseling			

#	CDS Intervention	Rating		
		1	2	3
	Targeted highlighting of relevant data			
	Reminder to order pertinent labs (creatinine, urine protein, etc.)			
	Reminder to order home blood pressure monitor prescription			
	Reminder to provide patient education materials on the DASH diet			
	Reminder to use a visit summary for 'teach back' to make sure patient understands treatment plan including medications, follow-up appointments, lifestyle goals, etc.			

AMA Tips for Accurate Blood Pressure Reading (Appendix M)

<https://www.ama-assn.org/sites/default/files/media-browser/public/iho/iho-graphic-7-tips.pdf>



Blood Pressure Log Template (Appendix N)

Is my blood pressure at goal?

Name

Record your blood pressure (BP). Write **TOP Number** (systolic BP) in **Column 1 (green)** if it is **139 or lower** or in **Column 2 (pink)** if it is **140 or higher**. Record bottom BP number and heart rate (pulse).

Date	Time	COLUMN 1	COLUMN 2	Bottom BP (Diastolic BP)	Pulse
		TOP BP 139 or lower	TOP BP 140 or higher		
	AM				
	PM				
	AM				
	PM				
	AM				
	PM				
	AM				
	PM				
	AM				
	PM				
	AM				
	PM				
	AM				
	PM				
	AM				
	PM				

If there are more TOP BP in the 1st column (GREEN) than in the 2nd column (PINK) your BP *IS* at goal.

If your BP *IS NOT* at goal, contact:

Contact

Sample Blood Pressure Log (Appendix O)

Is my blood pressure at goal?

Name _____

Record your blood pressure (BP). Write **TOP Number** (systolic BP) in **Column 1 (green)** if it is **139 or lower** or in **Column 2 (pink)** if it is **140 or higher**. Record bottom BP number and heart rate (pulse).

Date	Time	COLUMN 1	COLUMN 2	Bottom BP (Diastolic BP)	Pulse
		TOP BP 139 or lower	TOP BP 140 or higher		
5/23	10:30 AM		141	79	55
	8:00 PM		161	63	54
5/24	9:00 AM		146	79	52
	8:00 PM		157	68	57
5/25	8:00 AM	138		81	63
	8:30 PM		148	77	57
5/26	9:00 AM		151	78	52
	8:30 PM	137		70	52
5/27	9:00 AM		161	77	58
	8:35 PM		142	59	57
5/28	8:30 AM	134		79	57
	9:00 PM		157	79	60
5/29	9:00 AM		151	71	56
	7:30 PM	137		77	57

If there are more TOP BP in the 1st column (GREEN) than in the 2nd column (PINK) your BP IS at goal.

If your BP IS NOT at goal, contact:

Contact _____

Implementation Plan Template (Appendix P)

Instructions: Develop an implementation plan for each step in the new care process. Identify each task, along with who will take the lead and by what time the task should be finished or reviewed for an update. Select measures to track to help make sure that the strategies are working. See suggestions for measuring at the bottom of each “strategy” page in the Toolkit.

[illegible]

Implementation Plan Sample (Appendix Q)

Instructions: Develop an implementation plan for each step in the new care process. Identify each task, along with who will take the lead and by what time the task should be finished or reviewed for an update. Select measures to track to help make sure that the strategies are working. See suggestions for measuring at the bottom of each “strategy” page in the Toolkit.

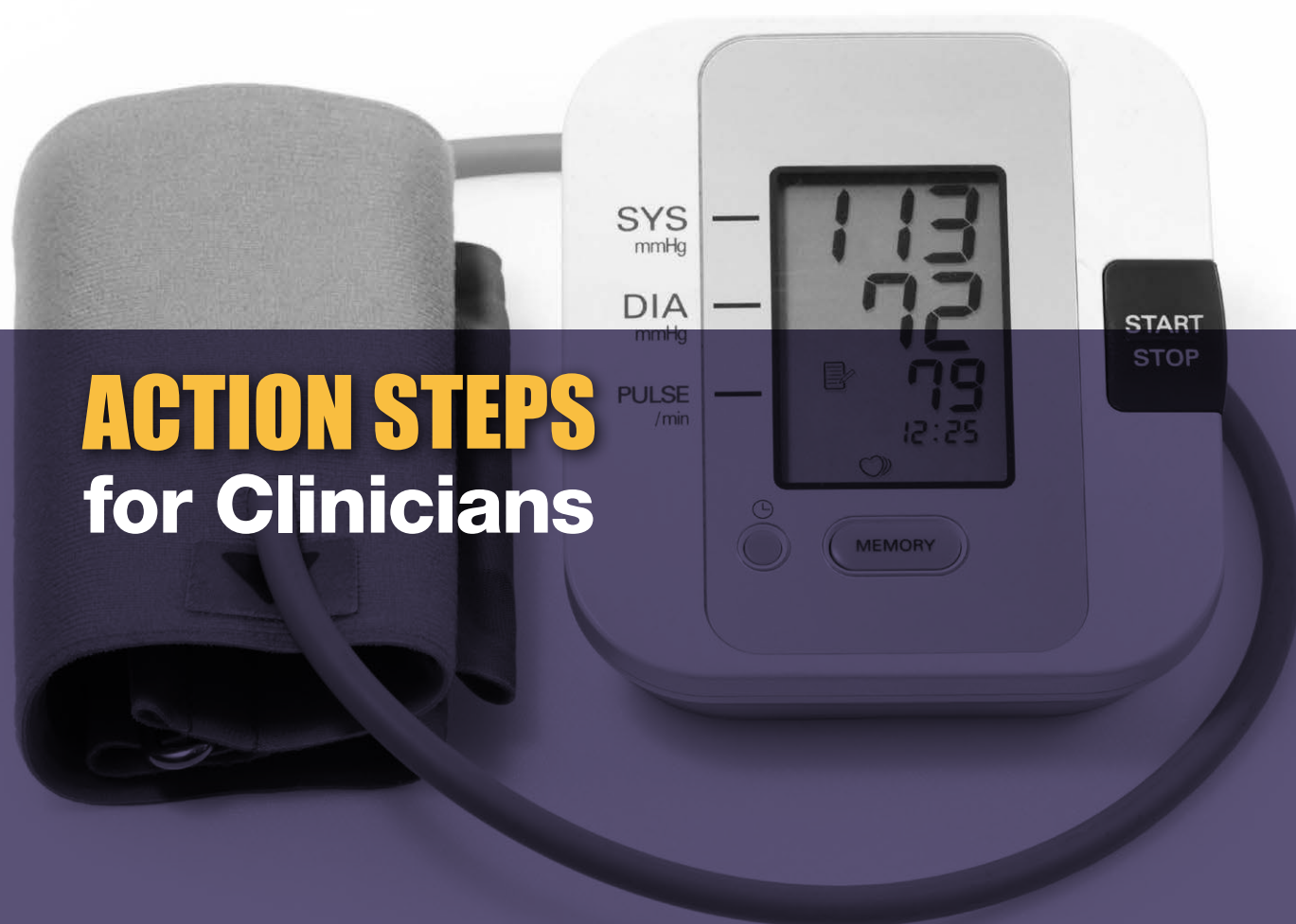
What	Who	By When	Outcome & Next Step
NEW FLOW OF WORK			
Maintain registry of patients with hypertension	Staff A All providers	Ongoing	<ul style="list-style-type: none"> Staff A will run a new report of patients with HTN and will identify patients with inadequately controlled blood pressure. Staff A will review this smaller sample for additional drivers. Track patients who need follow-up based on the practice’s protocols.
Schedule patients for future appointments at the conclusion of each visit	Staff B	March 24	<ul style="list-style-type: none"> Staff B will re-appoint the patient at the conclusion of the visit.
Measure blood pressure accurately and consistently in the office	Nursing staff A and B, Practice Manager	March 31	<ul style="list-style-type: none"> Post AMA’s poster in each exam room. At next staff meeting, watch webinar on how to take an accurate blood pressure and practice on one another.
Identify patient education resources and integrate into workflow.	Providers and Nursing staff, Practice Manager	March 15	<ul style="list-style-type: none"> Review patient resources at next staff meeting for accessible resources. Make copies available for handouts in each exam room. Contact EHR vendor to inquire about patient education resources.
MEASUREMENT			
Chart review to identify if patient education was provided	Nurse A, Practice Manager	May 1 to May 30	<ul style="list-style-type: none"> Bring results to staff meeting
Run a report on all patients with HTN and identify the number without a follow up appointment	Nurse B and Practice Manager	Monthly for three months: May to July	<ul style="list-style-type: none"> Call patients to schedule appointment.

From 70 to 80 percent: The Hypertension Management Toolkit
v1.0 06/17

The project was supported by Cooperative Agreement Number 6 NU58DP004834-04-02 from the CDC, US Department of Health and Human Services, to the Vermont Department of Health. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.



Hypertension Control



ACTION STEPS for Clinicians

Acknowledgments

We would like to extend special thanks to the following individuals for their assistance in the development and review of this document:

Centers for Disease Control and Prevention

Barbara Bowman, PhD	Kathy Harben, BA
Peter Briss, MD, MPH	Yuling Hong, MD, MSc, PhD, FAHA
David Callahan, MD, FAFP	Fleetwood Loustalot, PhD, FNP
Mary George, MD, MSPH, FACS, FAHA	Rikita Merai, MPH*
Allison Goldstein, MPH	Hilary K. Wall, MPH*
Judy Hannan, MPH, RN	Janet Wright, MD, FACC

* Denotes guide preparers

For More Information

Rikita Merai, MPH
Division for Heart Disease and Stroke Prevention
Centers for Disease Control and Prevention
rmerai@cdc.gov

Suggested Citation

Centers for Disease Control and Prevention. *Hypertension Control: Action Steps for Clinicians*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.

To reduce the burden of heart attack and stroke in the United States, the Department of Health and Human Services launched Million Hearts®. The goal of this initiative is to prevent one million heart attacks and strokes by 2017 by implementing proven and effective interventions in clinical settings and communities. Million Hearts® brings together communities, health systems, nonprofit organizations, federal agencies, and private-sector partners from across the country to fight heart disease and stroke.

High blood pressure is one of the leading causes of heart disease and stroke.¹ One in every three U.S. adults (67 million) has high blood pressure, and only about half of these individuals have their condition under control.² Of the 36 million

Americans who have uncontrolled hypertension, most have a usual source of care (89.4%), received medical care in the previous year (87.7%), and have health insurance (85.2%).³

The purpose of this document is to deliver tested strategies for busy clinicians to aid in efforts related to hypertension control. These strategies were gathered from the published scientific literature (evidence-based) or found to be effective in clinical settings (practice-based). The strategies are organized into three categories of actions to improve delivery system design (Table 1), improve medication adherence (Table 2), and optimize patient reminders and supports (Table 3). This document contains additional resources and references where more information can be found for each action step.

Strategies for Hypertension Control

Table 1. Actions to Improve Delivery System Design
Implement a standardized hypertension treatment protocol. ⁴ ▶ Support titration of hypertension medications by clinical team members via a physician-approved protocol. ^{5,6}
Designate hypertension champions within your practice or organization. ⁷
Proactively track and contact patients whose blood pressure is uncontrolled using an electronic health record (EHR)-generated list, patient registry, or other data source. ⁷⁻⁹
Create a blood pressure measurement station where all patients can rest quietly for 5 minutes before measurement and that is designed to support proper measurement techniques (e.g., feet on floor, proper arm position, multiple cuff sizes conveniently located). ⁹
Have care team members review a patient's record before the office visit to identify ways to improve blood pressure control. ⁷
Proactively provide ongoing support for patients with hypertension through office visits or other means of contact until blood pressure is controlled. ¹⁰
Implement systems to alert physicians about patterns of high blood pressure readings taken by support staff. ^{11,12} ▶ Place a sign or magnet on the outside of the examination room. ▶ Build clinical decision supports into the EHR.
Provide feedback to individual clinicians and clinic sites on their hypertension control rates. Provide incentives for high performance, and recognize high performers. ⁴
Provide blood pressure checks without a copayment or appointment. Train clerical personnel in proper blood pressure measurement technique so they are capable of obtaining drop-in blood pressure readings. ^{4,13}
Encourage clinicians to take continuing education on hypertension management and care of resistant hypertension. ^{4,14}

Table 2. Actions to Improve Medication Adherence

Encourage patients to use medication reminders. ^{15–18}
▶ Promote pill boxes, alarms, vibrating watches, and smartphone applications.
Provide all prescription instructions clearly in writing and verbally. ¹⁹
▶ Limit instruction to 3–4 major points.
▶ Use plain, culturally sensitive language.
▶ Use written information or pamphlets and verbal education at all encounters.
Ensure patients understand their risks if they do not take medications as directed. Ask patients about these risks, and have patients restate the positive benefits of taking their medications. ¹⁹
Discuss with patients potential side effects of any medications when initially prescribed and at every office visit thereafter. ²⁰
Provide rewards for medication adherence. ²¹
▶ Praise adherence.
▶ Arrange incentives, such as coupons, certificates, and reduced frequency of office visits.
Prescribe medications included in the patient’s insurance coverage formulary, when possible. ²²
Prescribe once-daily regimens or fixed-dose combination pills. ^{23–26}
Assign one staff person the responsibility of managing medication refill requests. ²⁷
▶ Create a refill protocol.
Implement frequent follow-ups (e.g., e-mail, phone calls, text messages) to ensure patients adhere to their medication regimen. ^{15,28–30}
▶ Set up an automated telephone system for patient monitoring and counseling.

Table 3. Actions to Optimize Patient Reminders and Supports

Provide patients who have hypertension with a written self-management plan at the end of each office visit. ^{12,31}
▶ Encourage or provide patient support groups.
▶ Use all staff interactions with patients as opportunities to assist in self-management goal-setting and practices.
▶ Print visit summaries and follow-up guidance for patients.
Generate lists of patients with hypertension who have missed recent appointments. Send phone, mail, e-mail, or text reminders. ¹³
Contact patients to confirm upcoming appointments, and instruct them to bring medications, a medication list, and home blood pressure readings with them to the visit. ⁷
Send a postcard to or call patients who have not had their blood pressure checked recently. Invite them to drop in to have their blood pressure checked by a medical assistant, nurse, or other trained personnel without an appointment and at no charge. ¹²
Send patients text messages about taking medications, home blood pressure monitoring, or scheduled office visits. ³⁰
Encourage patients to use smartphone or Web-based applications to track and share home blood pressure measurements. ^{32,33}
Encourage home blood pressure monitoring plus clinical support using automated devices with a properly sized arm cuff. ^{7,34,35}
▶ Advise patients on choosing the best device and cuff size.
▶ Check patients’ home monitoring devices for accuracy.
▶ Train patients on proper use of home blood pressure monitors.
Implement clinical support systems that incorporate regular transmission of patients’ home blood pressure readings and customized clinician feedback into patient care. ³⁵
▶ Train staff to administer specific clinical support interventions (e.g., telemonitoring, patient portals, counseling, Web sites).
▶ Incorporate regular transmission of patient home blood pressure readings through patient portals, telemonitoring, log books, etc., to clinicians and EHR systems.
▶ Provide regular customized support and advice (e.g., medication titration, lifestyle modifications) based on patient blood pressure readings.

Resources

Resources for Delivery System Design

[American Academy of Family Physicians](#). Using a Simple Patient Registry to Improve Your Chronic Disease Care.

[American Medical Group Foundation](#). Provider Toolkit to Improve Hypertension Control.

[Centers for Disease Control and Prevention](#). Protocol for Controlling Hypertension in Adults.

[Washington State Department of Health](#). Improving the Screening, Prevention, and Management of Hypertension—An Implementation Tool for Clinical Practice Teams.

Resources for Medication Adherence

[American Academy of Family Physicians](#). Improving Patient Care: Rethinking Refills.

[American College of Preventive Medicine](#). Medication Adherence Time Tool: Improving Health Outcomes.

[Centers for Disease Control and Prevention](#). Medication Adherence Educational Module.

[Script Your Future](#). Adherence Tools.

[Surescripts](#). Clinician's Guide to e-Prescribing: 2011 Update.

Resources for Patient Reminders and Supports

[Agency for Healthcare Research and Quality](#). Electronic Preventive Services Selector (ePSS).

[American Heart Association](#). Heart360. An Online Tool for Patients to Track and Manage Their Heart Health and Share Information with Healthcare Providers.

[Institute for Healthcare Improvement](#). Partnering in Self-Management Support: A Toolkit for Clinicians.

References

1. Frieden TR, Berwick DM. The “Million Hearts” initiative—preventing heart attacks and strokes. *N Engl J Med*. 2011;365:e27.
2. Valderrama AL, Gillespie C, King SC, George MG, Hong Y, Gregg E. Vital signs: awareness and treatment of uncontrolled hypertension among adults—United States, 2003–2010. *MMWR*. 2012;61:703–9.
3. Gillespie C, Kuklina EV, Briss PA, Blair NA, Hong Y. Vital signs: prevalence, treatment, and control of hypertension—United States, 1999–2002 and 2005–2008. *MMWR*. 2011;60(04):103–8.
4. Jaffe M, Lee G, Young J, Sidney S, Go A. Improved blood pressure control associated with a large-scale hypertension program. *JAMA*. 2013;310(7):699–705.
5. Centers for Disease Control and Prevention. *Field Notes: Kaiser Permanente Colorado Hypertension Management Program*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.
6. Curzio JL, Rubin PC, Kennedy SS, Reid JL. A comparison of the management of hypertensive patients by nurse practitioners compared with conventional hospital care. *J Hum Hypertens*. 1990;4(6):665–70.
7. Health Resources and Services Administration. *Hypertension Control*. Washington, DC: Health Resources and Services Administration, US Dept of Health and Human Services; 2012. www.hrsa.gov/quality/toolbox/508pdfs/hypertensioncontrol.pdf. Accessed October 30, 2013.
8. Burke W, Nelson K, Caulin-Glaser T, Snow R. Use of hypertension registry to identify patients at high risk for cardiovascular events caused by metabolic syndrome. *Ost Fam Phys*. 2010;2(10):124–30.
9. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, et al.; National Heart, Lung, and Blood Institute Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; National High Blood Pressure Education Program Coordinating Committee. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA*. 2003;289(19):2560–72.

10. McClellan W, Hall D, Brogan D, Miles C, Wilber J. Continuity of care in hypertension: an important correlate of blood pressure control among aware hypertensives. *Arch Intern Med*. 1988;148(3):525–8.
11. Roumie CL, Elasy TA, Greevy R, Griffin MR, Liu X, Stone WJ, et al. Improving blood pressure control through provider education, provider alerts, and patient education: a cluster randomized trial. *Ann Intern Med*. 2006;145(3):165–75.
12. Tashjian C. Making meaningful use of meaningful use: combining medicine and technology to improve quality and transform healthcare [PowerPoint slides]. Vital Signs Town Hall; September 4, 2012.
13. Bass M, McWhinney IR, Donner A. Do family physicians need medical assistants to detect and manage hypertension? *CMAJ*. 1986;134(11):1247–55.
14. Gullion D, Tschann J, Adamson E, Coates T. Management of hypertension in private practice: a randomized controlled trial in continuing medical education. *J Contin Educ Health Prof*. 1988;4(8):239–55.
15. Agency for Healthcare Research and Quality. *Medication Adherence Interventions: Comparative Effectiveness. Closing the Quality Gap: Revisiting the State of the Science*. Evidence Report/Technology Assessment No. 208. 2012. www.effectivehealthcare.ahrq.gov/ehc/products/296/1248/EvidenceReport208_CQGMedAdherence_FinalReport_20120905.pdf. Accessed September 5, 2013.
16. Connor J, Rafter N, Rodgers A. Do fixed-dose combination pills or unit-of-use packaging improve adherence? A systematic review. *Bull World Health Organ*. 2004;82(12):935–9.
17. Fenerty S, West C, Davis S, Kaplan S, Feldman S. The effect of reminder systems on patients' adherence to treatment. *Patient Prefer Adherence*. 2012;6:127–35.
18. Becker L, Glanz K, Sobel E, Mossey J, Zinn S, Knott KA. A randomized trial of special packaging of antihypertensive medication. *J Fam Pract*. 1986;22:357–61.
19. Domino FJ. Improving adherence to treatment for hypertension. *Am Fam Physician*. 2005;71(11):2089–90.
20. Brown M, Bussell J. Medication adherence: who cares? *Mayo Clin Proc*. 2011;86(4):304–14.
21. Krousel-Wood M, Hyre A, Munter P, Morisky D. Methods to improve medication adherence in patients with hypertension: current status and future directions. *Curr Opin Cardiol*. 2005;20(4):296–300.
22. Fischer M, Vogeli C, Stedman M, Ferris T, Brookhart A, Weissman J. Effect of electronic prescribing with formulary decision on medication use and cost. *Arch Intern Med*. 2008;168(22):2433–9.
23. Schroeder K, Fahey T, Ebrahim S. Interventions for improving adherence to treatment in patients with high blood pressure in ambulatory settings. *Cochrane Database Syst Rev*. 2004;(2):CD004804.
24. Iskedian M, Einarson TR, MacKeigan LD, Shear N, Addis A, Mittmann N, et al. Relationship between daily dose frequency and adherence to antihypertensive pharmacotherapy: evidence from a meta-analysis. *Clin Ther*. 2002;24:302–16.
25. Skaer TL, Sclar DA, Robison LM, Chin A, Gill MA, Okamoto MP, et al. Effect of pharmaceutical formulation for antihypertensive therapy on health service utilization. *Clin Ther*. 1993;15(4):715–25.
26. Claxton A, Cramer J, Pierce C. A systematic review of the association between dose regimens and medication compliance. *Clin Ther*. 2001;23(8):1296–310.
27. American Academy of Family Physicians. Practice pearls. *Fam Pract Manag*. 2008;15(3):42. www.aafp.org/fpm/2008/0300/p42.html. Accessed September 5, 2013.
28. Patton K, Meyers J, Lewis BE. Enhancement of compliance among patients with hypertension. *Am J Manag Care*. 1997;3(11):1693–8.
29. Friedman RH, Kazis LE, Jette A, Smith MB, Stollerman J, Torgerson J, et al. A telecommunications system for monitoring and counseling patients with hypertension. Impact on medication adherence and blood pressure control. *Am J Hypertens*. 1996;9:285–92.
30. Fisher HH, Moore SL, Ginosar D, Davidson AJ, Rice-Peterson CM, Durfee MJ, et al. Care by cell phone: text messaging for chronic disease management. *Am J Manag Care*. 2012;18(2):e42–7.
31. Chodosh J, Morton S, Walter M, Maglione M, Suttrop MJ, Hilton L, et al. Meta-analysis: chronic disease self-management programs for older adults. *Ann Intern Med*. 2005;143(6):427–38.

32. Logan A, Irvine M, Mclsaac W, Tisler A, Rossos PG, Easty A, et al. Effect of home blood pressure telemonitoring with self-care support on uncontrolled systolic hypertension in diabetics. *Hypertension*. 2012;60:51–7.
33. Magid D, Olson K, Billups S, Wagner N, Lyons E, Kroner B. A pharmacist-led, American Heart Association Heart 360 web-enabled home blood pressure monitoring program. *Circ Cardiovasc Qual Outcomes*. 2013;6:157–63.
34. Williams JS, Brown SM, Conlin PR. Videos in clinical medicine. Blood-pressure measurement. *N Engl J Med*. 2009;360(5):e6.
35. Centers for Disease Control and Prevention. *Self-Measured Blood Pressure Monitoring: Action Steps for Public Health Practitioners*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.



Million Hearts® is a U.S. Department of Health and Human Services initiative that is co-led by the Centers for Disease Control and Prevention and the Centers for Medicare & Medicaid Services, with the goal of preventing one million heart attacks and strokes by 2017.

SELF-MEASURED BLOOD PRESSURE MONITORING PROGRAM:

ENGAGING PATIENTS IN SELF-MEASUREMENT



Self-measured blood pressure monitoring program:

Engaging patients in self-measurement

This program is designed for use by physician offices and health centers to engage patients in self-measurement of blood pressure. This program describes various ways that the patient can obtain blood pressure (BP) measurements outside of the clinical office either through the purchase of a device or a physician-led blood pressure monitor loaner program. Your practice or health center will establish a process for

- Training staff on engaging patients in a self-measurement program
- Educating patients on hypertension
- Measuring blood pressure using proper positioning
- Suggestions for communicating blood pressure measurements back to the care team
- Guidance for instituting a blood pressure monitor loaner program

Disclaimer: Always make sure patients know what to do should they have a blood pressure measurement that is outside the pre-determined acceptable range or if they experience any symptoms with a high or low blood pressure measurement, including seeking emergency treatment if appropriate. This guidance to the patient should be individualized by the clinician and reinforced by clinical staff at the initiation of any SMBP monitoring program.

Suggested citation: Improving Health Outcomes: Blood Pressure. Murakami L and Rakotz M. Self-measured Blood Pressure Monitoring Program: Engaging Patients in Self-measurement. 1st ed. Daniel D and Prall M, eds. American Medical Association and the Johns Hopkins University School of Medicine; February 2015.

Acknowledgments: The authors acknowledge the contributions of the Centers for Disease Control and Prevention “Million Hearts®” program for its development of the [Self-measured Blood Pressure Monitoring Action Steps for Clinicians](#). We also would like to acknowledge the contributions by Romsai Tony Boonyasai, MD, MPH, and Marsha Kaufman, MSW.

Self-measured blood pressure monitoring program:

Engaging patients in self-measurement

Page	Name of document	Audience			
		Practice staff	Patient	Blood pressure monitor loaner program	Patient-owned blood pressure monitor
4	Measuring accurately: Self-measured blood pressure monitoring	X		X	X
6	Clinical competency: Patient self-measured blood pressure at home	X		X	X
8	Measure accurately: A guide for blood pressure measurement	X		X	X
9	How to check a home blood pressure monitor for accuracy	X		X	X
10	Patient selection criteria for a blood pressure monitor loaner program	X		X	
11	Patient enrollment process for a blood pressure device loaner program	X		X	
12	Patient participation and blood pressure device loaner agreement	X		X	
13	Diagnosis, communication, documentation and management	X		X	X
15	Recommended infection prevention process for blood pressure monitors loaned to patients	X		X	
16	BP monitor loaner log	X		X	
17	High blood pressure (hypertension) overview		X	X	X
19	Self-measured blood pressure at home		X	X	X
21	Self-measured blood pressure technique: How to take your own blood pressure		X	X	X
22	Self-measured blood pressure monitoring at home – flow sheet		X	X	X
23	Self-measured blood pressure patient log (wallet card)		X	X	X

Measuring accurately:

Self-measured blood pressure monitoring

What is self-measured blood pressure monitoring?

Self-measured blood pressure (SMBP) monitoring, sometimes called home blood pressure monitoring, is a patient-performed measurement of their own blood pressure outside of a clinical setting. Research shows that SMBP:

- Can improve adherence and health outcomes for hypertensive patients¹
- Is different from, and more convenient than, ambulatory blood pressure monitoring, which requires a more specialized monitor to measure multiple blood pressures at set intervals over a 24-hour period²
- Should always be accompanied by additional support, such as a one-time training session by a health care professional, during which patients should be observed to determine that they measure blood pressure readings correctly
- Is proven to improve blood pressure control when a patient/clinician feedback loop is used to provide personalized support and advice based on the patient's data¹

Which SMBP device should patients use?

Most of the methods shown to improve patient outcomes have used an automated (oscillometric) device. With automatic devices, patients wrap a cuff around their arm and press a button to obtain a digital blood pressure reading.

When recommending an automated blood pressure measurement device for self-monitoring, take the following features into careful consideration.

Is the device valid? Automatic devices should be certified by one of three respected organizations:

- Association for the Advancement of Medical Instrumentation
- British Hypertension Society
- European Society of Hypertension

Does the device measure blood pressure from the upper arm? Only upper arm (not wrist) monitors produce reliable measures and these are the only type of monitors that reputable organizations recommend for home use.^{2,3}

Will patients find the device easy to use? Devices come in a range of models with varying features. For example, patients with visual, motor or hearing impairments may prefer devices with large digital display and large buttons and/or that use voice commands to operate.

Does the device make it easy for patients to share results with their provider? Consider whether the device has the ability to:

- Store readings and report them back at a later time
- Calculate an average measure over multiple readings
- Transmit information to other devices, including to apps or to your electronic health record (EHR) system

Does your EHR permit the direct transmittal of blood pressure measurements via a patient portal?

If so, you should establish a protocol to ensure that dangerously abnormal readings reported into the EHR receive timely responses.

How much does the device cost? Many public and private health insurance plans do not cover the cost of self-monitoring devices. Prices for a typical, high-quality device (available for purchase at most drug stores) can range between \$50 and \$150.

How should you and your patients use a home blood pressure monitor?

A universally accepted protocol for self-monitoring blood pressure does not exist. However, many patients and providers have found the following instructions useful. They are adapted from the Finn Protocol⁴ by Michael Rakotz, MD, at Northwestern Medical Group.

- Ask your patients to find a space where they can position themselves appropriately: seated comfortably in a chair with their legs uncrossed, feet flat on the floor, and arm and back supported. The cuff should be wrapped snugly but not tightly around their upper arm.
- Ask your patient to take two blood pressure readings at one- to two-minute intervals, both in the morning and in the evening for seven consecutive days. This will provide four blood pressure measurements a day, totaling 28 measurements for the week, which is ideal. However, it is worth noting that even three days of measurements (i.e., 12 readings) also has prognostic value.
- Ask your patient to record each blood pressure measurement.
- When you receive these measurements calculate the average (mean) value of all the systolic and diastolic blood pressures. Use this single average value to determine if your patient has hypertension or if your patient's blood pressure is controlled.
- It is important to note that self-monitored blood pressure values trend approximately 5mm Hg lower than those obtained by nurses in research settings. Thus a self-monitored systolic blood pressure of 135mm Hg is equivalent to a high-quality systolic blood pressure of 140mm Hg. The American Society of Hypertension recommends that when diagnosing or treating hypertension, providers and patients should consider a mean blood pressure >135/85 as the threshold for diagnosing hypertension or for treating high blood pressure.

Resources

List of validated home blood pressure monitors

Dabl Educational Trust website: <http://bit.ly/1pLvucM>

British Hypertension Society website: bhsoc.org/index.php?CID=247

Additional information on home blood pressure monitors

Association for the Advancement of Medical Instrumentation website: aami.org

European Society of Hypertension website: eshonline.org

Article on wireless blood pressure cuffs and Smartphone applications: <http://bit.ly/1pLvFF4>

References

1. Centers for Disease Control and Prevention Self-Measured Blood Pressure Monitoring: Action Steps for Public Health Practitioners, GA: Centers for Disease Control and Prevention, US Dept. of Health and Human Services; 2013.
2. Pickering TG, Miller NH, Ogedegbe G, Krakoff LR, Artinian NT, Goff D. Call to action on use and reimbursement for home blood pressure monitoring: A Joint Scientific Statement from the American Heart Association, American Society of Hypertension, and Preventive Cardiovascular Nurses Association. *Hypertension*. 2008; 52:10-29.
3. Uhlig K, Balk EM, Patel K, Ip S, Kitsios GD, Obadan NO, et al. Self-Measured Blood Pressure Monitoring: Comparative Effectiveness. Comparative Effectiveness Review No. 45. (Prepared by the Tufts Evidence-based Practice Center under Contract No. HHSA 290-2007-10055-I.) AHRQ Publication No. 12-EHC002-EF. Rockville, MD: Agency for Healthcare Research and Quality, US Dept. of Health and Human Services; 2012. http://www.effectivehealthcare.ahrq.gov/ehc/products/193/893/CER45_SMBP_20120131.pdf. Accessed July 9, 2014.
4. Niiranen TJ, Johansson JK, Reunanen A, Jula AM. Optimal Schedule for Home Blood Pressure Measurement Based on Prognostic Data: The Finn-Home Study. *Hypertension*. 2011; 57: 1081-1086. doi: 10.1161/HYPERTENSIONAHA.110.162123
5. Improving Health Outcomes: Blood Pressure. Murakami L, Astalas A, Boonyasai R, Wynia M, Rush C, Rakotz M. Fast Facts: Home Blood Pressure Monitoring. 1st ed. Daniel D and Prall M, eds. American Medical Association and the Johns Hopkins University School of Medicine; May 2014.

Make sure patients know what to do should they have a blood pressure measurement that is outside the pre-determined acceptable range, or if they experience any symptoms with a high or low blood pressure measurement, including seeking emergency treatment if appropriate. This guidance to the patient should be individualized by the clinician and reinforced by clinical staff at the initiation of any SMBP monitoring program.

Clinical competency:

Patient self-measured blood pressure at home

Clinical staff should be trained and tested on measuring blood pressure accurately. Using an essential competency like this will help demonstrate that staff can effectively teach patients to perform accurate blood pressure measurement independently at home.

How to use the competency form:

- Perform competencies at least twice a year.
- Fill in the name of the employee and the trainer.
- Follow the procedures step-by-step and determine if the employee is following them correctly.
- Based on the trainer's observation, place a check mark in either the column labeled "Meets competency" or "Needs more training."
- Use the following options to document the "Method of validation":
 - If the trainer showed the employee how to do the procedure and the employee then demonstrated the procedure, write "RD" for **return demonstration in a simulated patient setting**.
 - If the trainer is observing the employee perform the procedure while providing direct patient care, write "PC" for **direct patient care observation**.
- Both the employee and trainer should sign and date the competency form.
- Make the competency form part of the employee's training file.

Copyright 2015 American Medical Association and The Johns Hopkins University. All Rights Reserved. Please feel free to adapt this content to meet the needs of your organization to improve health outcomes solely for non-commercial purposes. Use of the names of the American Medical Association or The Johns Hopkins University or the logos of either beyond use of the names in the required permission statement is not permitted on any adaptations without prior written authorization. The following should appear on the first page or screen of adaptations:

"This [content description, e.g., protocol or checklist] was adapted with permission of the American Medical Association and The Johns Hopkins University. All Rights Reserved. The original copyrighted content can be found at [link]."

This clinical competency is not intended to be comprehensive. Additions and modifications to fit local practice or health center are encouraged.

Clinical competency:

Patient self-measured blood pressure (SMBP) at home

Employee's name (print): _____

Trainer's name (print): _____

Procedure	Meets competency (Check if "Yes")	Needs more training (Check if "Yes")	Method of validation RD: Return demonstration PC: Direct patient care observation
Explain the purpose of SMBP to the patient			
Tell the patient to use the bathroom if they need to prior to measuring their blood pressure (BP)			
Tell the patient to rest sitting in a chair for several minutes prior to measuring their blood pressure			
Ensure the patient's device has the correct cuff size (You may need to guide the patient to purchase a different size cuff from the manufacturer.)			
Show the patient how to position the cuff correctly on the arm against bare skin (NOTE: Refer to the manufacturer's user manual for instruction on placement of the tubing.)			
Teach the patient proper positioning: • Seated in a chair with back supported • Legs should be uncrossed • Feet flat on the ground or supported by a foot stool • Arm supported with the BP cuff in place and positioned so that the BP cuff is at the level of the patient's heart			
Direct the patient not to talk, use the phone, text, email or watch television during the procedure. (Also explain that no one else should be talking during blood pressure measurement.)			
Instruct the patient to take two readings one minute apart, once in the morning and once in the evening			
Show the patient how to turn on the device and press the start button			
If an error reading occurs, direct the patient to start over			
When the cuff completes the deflating process and a reading is displayed, explain to the patient which numbers represent the systolic and diastolic blood pressure			
Show the patient how to document their blood pressure on the flow sheet or wallet card If the device has memory capability, show the patient how to retrieve the readings			
Provide the patient with instructions on what to do if readings show an abnormal blood pressure measurement			

Comments: _____

Employee's signature: _____ Date: _____

Trainer's signature: _____ Date: _____

Measure accurately:

A guide for blood pressure measurement

The importance of accurate blood pressure (BP) measurement cannot be minimized when diagnosing or treating hypertension. Measuring blood pressure accurately every time requires:

- Well-supported standard processes that are easy for staff to follow
- Staff who consistently use proper technique
- Easy availability of equipment and space

Excellent measurement technique requires training and skill building, but a few common problems related to patient preparation and positioning often account for unreliable readings.^{1,2}

Here are several common problems that account for inaccurate blood pressure measurement:

When patient has ...	BP can change by this much ... ^{3,4}
Cuff over clothing	10–40 mm Hg
Full bladder	10–15 mm Hg
Conversation or is talking	10–15 mm Hg
Unsupported arm	10 mm Hg
Unsupported back	5–10 mm Hg
Unsupported feet	5–10 mm Hg
Crossed legs	2–8 mm Hg

A standardized process should be implemented to ensure blood pressure is measured accurately for each patient. Steps to include are:

- Use a validated, automated device to measure BP.⁵
- Ask the patient “Do you need to use the bathroom?” and allow him/her to do so if needed prior to measurement.³
- Use the correct cuff size for the patient’s arm.³
- Ensure the patient is properly positioned³:
 - Seated in a chair with the back supported
 - Legs uncrossed
 - Feet flat on the ground or supported by a foot stool
 - Arm supported with the blood pressure cuff in place and positioned so that the cuff is at the level of the patient’s heart
- Do not allow the patient to talk, use the phone, text or email during the procedure.
- Employees should also not talk during the procedure.

See the “Self-measured blood pressure technique” patient handout for a graphical representation of measuring accurately.

References

1. Williams JS, Brown SM, Conlin PR. Blood-Pressure Measurement. *N Engl J Med*. 2009;360(5):e6.
2. Ogedegbe G, Pickering T. Principles and techniques of blood pressure measurement. *Cardiol Clin*. 2010 Nov;28(4):571-86.
3. Pickering TG, Hall JE, Appel LJ, et al. Recommendations for blood pressure measurement in humans and experimental animals: part 1: blood pressure measurement in humans: a statement for professionals from the Subcommittee of Professional and Public Education of the American Heart Association Council on High Blood Pressure Research. *Circulation*. Feb 8 2005;111(5):697-716
4. O'Brien E, Asmar R, Beilin L, et al. European Society of Hypertension recommendations for conventional, ambulatory and home blood pressure measurement. *J Hypertens* 2003; 21: 821-848.
5. Campbell NR, Berbari AE, Cloutier L, et al. Policy statement of the world hypertension league on noninvasive blood pressure measurement devices and blood pressure measurement in the clinical or community setting. *J Clin Hypertens*. 2014; 16(5): 320-322.

How to check a home blood pressure monitor for accuracy*

The first step in choosing an accurate monitor is to select one that has been approved under a formal validation protocol; all self-measured blood pressure devices sold in the United States are required to meet Food and Drug Administration standards. However, even a device that has passed an accepted validation test will not provide accurate readings in all patients; the error may be consistently + 5 mm Hg in many individuals, especially elderly patients or patients with diabetes. For this reason clinicians should encourage patients to bring any home blood pressure monitor they use to their physician's office to measure its accuracy against a mercury sphygmomanometer or comparable device before the readings are accepted. A simple version of the European Society of Hypertension International Protocol has been developed for this purpose and can be done quickly by the physician or other health care clinician and the patient.

The following steps to ensure accuracy take approximately 10 minutes.

1. Have the patient sit down with his or her arm at heart level. The arm should be completely relaxed.
2. Allow the patient to rest for five minutes.
3. Avoid any conversation during the measurements to prevent an increase in blood pressure.
4. Take a total of five sequential same-arm blood pressure readings, no more than 30 seconds apart.
5. Have the patient take the first two readings with his or her own device.
6. Take the third reading, preferably with a mercury sphygmomanometer or comparable device.
7. Have the patient take the fourth reading.
8. The fifth and final reading is taken by the health care clinician.
9. Compare the difference between the readings from the two cuffs.
 - a. BP readings will usually decline over the five measurements. The final systolic blood pressure reading may be as much as 10 mm Hg lower than the first.
 - b. If the difference is 5 mm Hg or less, the comparison is acceptable.
 - c. Do the calibration again if the difference is greater than 5 mm Hg but less than 10 mm Hg.
 - d. The device may not be accurate if the difference is greater than 10 mm Hg.
10. Repeat this procedure annually.

Though there is no established target for how close the readings from the patient's cuff should be to those from the clinician's cuff, the above exercise can provide a general sense of the device's accuracy, which can be taken into consideration for future measurements recorded at home. To further ensure accuracy, consider calibrating the clinic and home devices following the National Health and Nutrition Examination Survey (NHANES) Health Tech/Blood Pressure Procedures Manual. The manual can be found at: cdc.gov/nchs/data/nhanes/nhanes_09_10/bp.pdf

* Adapted from Centers for Disease Control and Prevention. *Self-Measured Blood Pressure Monitoring: Action Steps for Clinicians*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2014: 24.

Patient selection criteria for a blood pressure monitor loaner program

Practice sites can consider the following criteria for selecting patients to participate in the blood pressure monitor loaner program:

The patient has a measured blood pressure > 140/90 mmHg on the first and subsequent readings during an office visit.

- ✓ The patient has elevated readings persisting for two or more subsequent office visits.
- ✓ The patient has a diagnosis of hypertension, is being ruled out for a diagnosis of hypertension or has white coat hypertension.
- ✓ The practice's device has a cuff size appropriate for the patient.

Recommended cuff sizes for accurate measurement of blood pressure¹

Arm circumference	Cuff size
22 to 26 cm	12 x 22 cm (small adult)
27 to 34 cm	16 x 30 cm (adult)
35 to 44 cm	16 x 36 cm (large adult)

- ✓ The patient has the aptitude to take an accurate measurement and willingness to take blood pressure readings consistently. The patient must also be capable of documenting the readings if the loaner device does not have memory storage capability.
- ✓ The patient meets the above criteria and has expressed a desire to take blood pressure readings at home, but is unable to purchase a home blood pressure device AND/OR the clinician feels home measurement will only be needed for a short period of time and patient purchase would be unnecessary.

Copyright 2015 American Medical Association and The Johns Hopkins University. All Rights Reserved. Please feel free to adapt this content to meet the needs of your organization to improve health outcomes solely for non-commercial purposes. Use of the names of the American Medical Association or The Johns Hopkins University or the logos of either beyond use of the names in the required permission statement is not permitted on any adaptations without prior written authorization. The following should appear on the first page or screen of adaptations:

"This [content description, e.g., protocol or checklist] was adapted with permission of the American Medical Association and The Johns Hopkins University. All Rights Reserved. The original copyrighted content can be found at [link]."

Reference

1. Pickering TG, Hall JE, Appel LJ, et al. Recommendations for blood pressure measurement in humans: An AHA scientific statement from the Council on High Blood Pressure Research Professional and Public Education Subcommittee. J Clin Hypertens. February 2005; 7(2): 102-109. Accessed December 22, 2014.

Patient enrollment process for a blood pressure device loaner program

Please use this document as a checklist to ensure continuity and consistency among staff members when distributing a loaner blood pressure (BP) device to the patient.

- ☐ The physician or other designated staff member confirmed the patient meets the criteria for patient selection (see "Patient selection criteria" document).
- ☐ The physician or other designated staff member discussed the loaner program and expectations with the patient and receive agreement on actively participating in self-measured blood pressure at home.
- ☐ Upon agreement, educate the patient on use of the blood pressure monitor:
 - How to measure blood pressure accurately
 - Functionality and use of the blood pressure monitor
 - How to read and understand the digital display
- ☐ Provide the following handouts to the patient and review them together:
 - Self-measured blood pressure at home: Patient information
 - Self-measured blood pressure technique
 - High blood pressure (hypertension) overview
 - Self-measured blood pressure and pulse at home flow sheet and/or BP log wallet card
- ☐ Fill out the "BP monitor loaner log."
- ☐ Complete and have the patient sign the "Patient participation and loaner device agreement."
- ☐ Document participation in program in patient medical record.
- ☐ Inform patient on specifics of how they should communicate blood pressure measurements back to the office, including how often, and document it in the medical record.
- ☐ Upon return of the device, perform infection prevention measures and document the return in the "BP monitor loaner log."

Copyright 2015 American Medical Association and The Johns Hopkins University. All Rights Reserved. Please feel free to adapt this content to meet the needs of your organization to improve health outcomes solely for non-commercial purposes. Use of the names of the American Medical Association or The Johns Hopkins University or the logos of either beyond use of the names in the required permission statement is not permitted on any adaptations without prior written authorization. The following should appear on the first page or screen of adaptations:

"This [content description, e.g., protocol or checklist] was adapted with permission of the American Medical Association and The Johns Hopkins University. All Rights Reserved. The original copyrighted content can be found at [link]."

Patient participation and blood pressure device loaner agreement

- I agree to participate in the Blood Pressure Device Loaner Program.
- I will take my blood pressure using the monitor provided to me and as directed by my doctor or staff member.
- I will record the blood pressure readings as instructed below.
- I will report these readings to my doctor's office as instructed below.
- I will contact my doctor as instructed for any blood pressure reading of more than _____.
- I will return this monitor on the anticipated return date (listed below) as determined by my doctor or staff member.

Blood pressure device serial number: _____

Anticipated date of return: _____

Blood pressure is to be measured and recorded twice daily, two measurements one minute apart every morning and two measurements one minute apart every evening for ____ days.

Alternatively, _____

Blood pressures will be reported back to the doctor's office by (circle one):

Telephone

Bringing machine / blood pressure log back to office for review

Patient portal / secure computer messaging

Patient name (print): _____

Patient date of birth: _____

Patient signature: _____

Date: _____

Copyright 2015 American Medical Association and The Johns Hopkins University. All Rights Reserved. Please feel free to adapt this content to meet the needs of your organization to improve health outcomes solely for non-commercial purposes. Use of the names of the American Medical Association or The Johns Hopkins University or the logos of either beyond use of the names in the required permission statement is not permitted on any adaptations without prior written authorization. The following should appear on the first page or screen of adaptations:

"This [content description, e.g., protocol or checklist] was adapted with permission of the American Medical Association and The Johns Hopkins University. All Rights Reserved. The original copyrighted content can be found at [link]."

Diagnosis, communication, documentation and management

Diagnosis

When patients have elevated blood pressures in the office and the diagnosis of hypertension is suspected, self-measured blood pressure (SMBP) can be very useful in distinguishing between white coat hypertension (or isolated office hypertension) and true hypertension. White coat hypertension occurs when a patient's blood pressure is persistently elevated in the office setting, but out-of-office blood pressures are in the normal range. SMBP is also useful in identifying patients with masked hypertension. Masked hypertension occurs when office blood pressures are normal, but out-of-office blood pressures are elevated. This is one of the most dangerous types of hypertension, as both the patient and physician can remain unaware for long periods of time.

To confirm the diagnosis of hypertension¹ in a patient with elevated office blood pressures or to increase the chance of diagnosing a patient suspected of having masked hypertension, it is best to use multiple readings over time. This is due to the significant variability in everyone's blood pressure over time. There is one protocol for SMBP at home that is the most widely accepted, and used in most guidelines.²

- Have your patients take at least two blood pressure measurements with a validated automated upper arm device (one minute apart) each morning and each evening for at least four days.
- Calculate the average of all of the measured systolic and diastolic blood pressures into a single averaged systolic and single averaged diastolic blood pressure (see "Documentation" below).
- If the average blood pressure is either a systolic blood pressure (SBP) >135 mm Hg or diastolic blood pressure (DBP) > 85 mm Hg then the patient meets the criteria for having hypertension.
- If the diagnosis of hypertension, white coat hypertension or masked hypertension remains uncertain after using SMBP, then use 24-hour ambulatory blood pressure monitoring (ABPM).

Communication

To be most effective, self-measured blood pressures from home should be communicated back to the physician's office for interpretation.

Home blood pressure measurements can be communicated back to the physician or care team in several ways:

- The patient can phone the measurements to the office to an assigned staff member.
- The patient can fax the measurements to the office via a pre-provided secure fax number.
- The patient can send the measurements online through the facility's secure patient portal.
- The patient can send the measurements online through a secure telemedicine site, such as the American Heart Association's Heart360 tool (heart360.org).
- If the blood pressure device has memory storage capability, the patient can bring the device to the office for staff to review or download.
- The patient can return for a scheduled follow-up visit after the home measurement period is completed. (NOTE: If the patient received a loaner blood pressure device, this can assist in securing its return.)

Each physician office is encouraged to analyze the process it uses to have patients communicate home blood pressure readings. Inform to patients how and when you will respond to their communications and what the patient should do in the event of a concerning blood pressure reading, particularly if the office is not able or does not intend to respond immediately.

Documentation

The average SMBP measurement from home should be documented in the patient's health record.

All of the individual blood pressure measurements performed by the patient should be averaged into a single blood pressure that will be used to determine the diagnosis and/or guide treatment.

- Calculate the average of all the readings and document that result.
- If a patient provides you with an average of the readings, verify the method used.
 - Manual patient calculations should be verified by the physician or a member of the office staff.
- Some electronic medical record applications have the capability to do this automatically. If that is not available, perform a manual calculation.
- Place documentation of this average value in the patient's record in a field designated for self-measured or home blood pressure readings.
 - Some electronic medical record systems only provide the capability to record these extra blood pressure measurements within a text field of the clinical note.
 - Consult with your electronic medical record vendor for the best solution based on your electronic medical records' functionality.

Management

SMBP at home is useful in the management of hypertension for several reasons.

SMBP:

- Yields many blood pressure measurements over time, (with fewer office visits) which helps determine if a change in therapy is warranted and helps prevent over-treatment.
 - Variation in blood pressure occurs in everyone, making treatment decisions difficult. No single medication is equally effective for all patients, so multiple measurements over time are needed to determine if control has been achieved.
- Improves blood pressure control, especially if the patient uses a form of clinical support.
 - Examples include telemonitoring with counseling, pharmacist counseling, self-adjustment of medications, remote counseling from a nurse or lifestyle counseling.³
- Provides measurements correlated more closely with target organ damage as compared to office blood pressure measurements.
- Improves adherence to antihypertensive therapy.⁴
- When combined with telemonitoring, can increase aggressiveness of pharmacotherapy⁵ and help reduce therapeutic inertia.

Copyright 2015 American Medical Association and The Johns Hopkins University. All Rights Reserved. Please feel free to adapt this content to meet the needs of your organization to improve health outcomes solely for non-commercial purposes. Use of the names of the American Medical Association or The Johns Hopkins University or the logos of either beyond use of the names in the required permission statement is not permitted on any adaptations without prior written authorization. The following should appear on the first page or screen of adaptations:

"This [content description, e.g., protocol or checklist] was adapted with permission of the American Medical Association and The Johns Hopkins University. All Rights Reserved. The original copyrighted content can be found at [link]."

References

1. Niiranen TJ, Johansson JK, Reunanen A, Jula AM. Optimal schedule for home blood pressure measurement based on prognostic data. *Hypertension*. 2011; 57: 1081-1088.
2. Niiranen TJ, Asayama K, Thijs L, et al. Outcome-driven thresholds for home blood pressure measurement. *Hypertension*. 2013; 61: 27-34.
3. McManus J, Mant J, Bray EP, et al. Telemonitoring and self-management in the control hypertension (TASMINH2): a randomized controlled trial. *Lancet*. 2010; 376: 163-172.
4. Bosworth HB, Powers BJ, Olsen MK, et al. Home blood pressure management and improved blood pressure control: Results from a randomized controlled trial. *Arch Intern Med*. 2011; 171: 1173-1180.
5. Omboni S, Gazzola T, Carabelli G, Parati, G. Clinical usefulness and cost effectiveness of home blood pressure telemonitoring: Meta-analysis of randomized controlled studies. *J Hypertension*. 2013; 31: 455-467.

Recommended infection prevention process for blood pressure monitors loaned to patients

Infection prevention is important in any setting where care is delivered. The Centers for Disease Control and Prevention (CDC) have developed minimum standards for safe care that includes medical equipment.

According to the CDC, non-critical items (e.g., blood pressure cuffs) are objects that may come into contact with intact skin but not mucous membranes and should go through cleaning and low- or intermediate-level disinfection.¹

Per the “CDC Guideline for Disinfection and Sterilization in Healthcare Facilities”:

“Disinfect noncritical surfaces with an [Environmental Protection Agency (EPA)]-registered hospital disinfectant according to the label’s safety precautions and use directions. Most EPA-registered hospital disinfectants have a label contact time of 10 minutes. However, many scientific studies have demonstrated the efficacy of hospital disinfectants against pathogens with a contact time of at least 1 minute. By law, the user must follow all applicable label instructions on EPA-registered products. If the user selects exposure conditions that differ from those on the EPA-registered product label, the user assumes liability for any injuries resulting from off-label use and is potentially subject to enforcement action under [Federal Insecticide, Fungicide, and Rodenticide Act]. Category II, IC.”²

Process

- Upon return of the blood pressure monitor, place it in a location designated for dirty equipment.
- Clean the equipment per CDC guidelines and place it in a location designated for clean equipment.
- Document the disinfection of the blood pressure monitor in the “Blood pressure monitor loaner log.”

Copyright 2015 American Medical Association and The Johns Hopkins University. All Rights Reserved. Please feel free to adapt this content to meet the needs of your organization to improve health outcomes solely for non-commercial purposes. Use of the names of the American Medical Association or The Johns Hopkins University or the logos of either beyond use of the names in the required permission statement is not permitted on any adaptations without prior written authorization. The following should appear on the first page or screen of adaptations:

“This [content description, e.g., protocol or checklist] was adapted with permission of the American Medical Association and The Johns Hopkins University. All Rights Reserved. The original copyrighted content can be found at [link].”

References

1. Centers for Disease Control and Prevention. Infection prevention checklist for outpatient settings: Minimum expectations for safe care; vol 1. CDC publication CS224818. <http://www.cdc.gov/HAI/pdfs/guidelines/Outpatient-Care-Guide-withChecklist.pdf>. Accessed January 23, 2015.
2. Rutala W, Weber D, Healthcare Infection Control Practices Advisory Committee; Centers for Disease Control and Prevention. Guideline for disinfection and sterilization in healthcare facilities, 2008. http://www.cdc.gov/hicpac/pdf/guidelines/Disinfection_Nov_2008.pdf. Accessed January 23, 2015.

BP monitor loaner log

Device serial number	Patient name	Patient MRN	Date loaned	Date due for return	Date returned	Date device disinfected	Function check date

Copyright 2015 American Medical Association and The Johns Hopkins University. All Rights Reserved. Please feel free to adapt this content to meet the needs of your organization to improve health outcomes solely for non-commercial purposes. Use of the names of the American Medical Association or The Johns Hopkins University or the logos of either beyond use of the names in the required permission statement is not permitted on any adaptations without prior written authorization. The following should appear on the first page or screen of adaptations:

"This [content description, e.g., protocol or checklist] was adapted with permission of the American Medical Association and The Johns Hopkins University. All Rights Reserved. The original copyrighted content can be found at [link]."

High blood pressure (hypertension) overview

Background

High blood pressure is also known as hypertension. Blood pressure (BP) is the pressure of the blood against the walls of the blood vessels as it moves through the body. Blood pressure rises and falls during the course of the day, but if it is high for a long time, it can cause serious health problems.

Blood pressure is written as two numbers:

- **Systolic blood pressure (SBP)** is the “top” number of your blood pressure measurement. It represents the pressure generated when the heart beats. A systolic blood pressure less than 120 mm Hg is considered normal. An SBP of 140 mm Hg or higher indicates hypertension in most people.
- **Diastolic blood pressure (DBP)** is the “bottom” number of your blood pressure measurement. It represents the pressure in the blood vessels when the heart is at rest. A diastolic blood pressure less than 80 mm Hg is considered normal. A DBP of 90 mm Hg or higher indicates hypertension in most people.

Blood pressure levels	
Normal	Systolic: less than 120 mm Hg Diastolic: less than 80 mm Hg
At Risk (pre-hypertension)	Systolic: 120–139 mm Hg Diastolic: 80–89 mm Hg
High	Systolic: 140 mm Hg or higher Diastolic: 90 mm Hg or higher

Make sure you know what to do should you have a blood pressure measurement that is outside the pre-determined acceptable range or if you are experiencing any symptoms with a high or low blood pressure measurement, including seeking emergency treatment if appropriate. This plan should be established between you and your clinician prior to you initiating home blood pressure monitoring. It should also be reinforced by clinical staff at the initiation of a Self-measured blood pressure monitoring program.

Types of hypertension and risks

- **Essential hypertension** is the most common type of hypertension. It is caused by genetics and environmental factors. It can be affected by your diet and how much salt you use. Obesity increases your risk for essential hypertension. Your risk also increases as you age because your blood vessels become stiffer, which causes your blood pressure to go up.
- **Secondary hypertension** is much less common. It is caused by specific diseases of different parts of your body such as your kidneys, adrenal glands or blood vessels.
- **White coat hypertension**, sometimes called white coat syndrome, is when a patient has elevated blood pressure readings in a medical setting (such as a doctor’s office) and normal blood pressures when not in a medical setting (such as at home or at work). The elevated blood pressure readings are thought to be due to anxiety from being in a medical setting.

Other things that can increase your risk for hypertension include medicines you take. Birth control pills and steroids, for example, can raise your blood pressure. Illegal drugs that are stimulants, like cocaine, can also cause hypertension or make it worse, as can alcohol.

Signs and symptoms of high blood pressure

High blood pressure does not usually have any warning signs or symptoms and is often called a “silent disease.” Effects of prolonged untreated hypertension most often occur late in the disease. That is why it is important for your blood pressure be checked regularly to find out if it is high. Early identification of high blood pressure will help prevent damage to your body’s organs and decrease your risk of heart attack and stroke.

Treating and controlling high blood pressure

- **Medications:** Your doctor may prescribe a number of pills for you to take. It is important to follow the directions for taking these medications. Low cost medications are available. Let your doctor know if these medications present any physical or financial problems for you.
- **Healthy weight:** Maintaining a healthy weight is important to blood pressure control. If you are overweight, losing 5 percent to 10 percent of your current body weight can help lower your blood pressure. That is about 20 pounds for someone who weighs 200 pounds. Excess weight adds to the effort your heart makes to pump blood through your body.
- **Exercise:** Exercising 30 minutes at least five days per week can help lower your blood pressure. If you are not currently exercising, review a plan with your doctor before you start.
- **DASH eating plan:** DASH stands for “Dietary Approaches to Stop Hypertension.” This diet includes a diet with lots of fruits, vegetables, low-fat dairy products, and lower saturated and total fat. The DASH eating plan is also lower in sodium and less sodium is known to help lower blood pressure.
- **Alcohol and tobacco:** Having more than one alcoholic drink per day can raise your blood pressure. It can also cause liver damage and increase your risk for a variety of cancers. Smoking and tobacco use will also raise your blood pressure. Don’t smoke or use any tobacco products.
- **Self-measured blood pressure:** Research shows that people who measure their blood pressure at home and report results to their doctor or care team member have better blood pressure control. Your doctor or care team member may advise you on how often you should check your blood pressure, especially when you are first diagnosed with high blood pressure or when changing your medications.
- **Doctor visits:** Follow up with your doctor regularly when you have high blood pressure. Your doctor may ask you to come to the office as often as every one or two weeks to have your blood pressure checked when you are first diagnosed. Once your BP is under control, your doctor will create a schedule for you to return to the office.

Additional resources

Weight control: cdc.gov/healthyweight/index.html

Exercise: cdc.gov/physicalactivity/index.html

DASH eating plan: nhlbi.nih.gov/files/docs/public/heart/dash_brief.pdf

Limiting alcohol use: cdc.gov/alcohol

Quitting smoking: cdc.gov/tobacco

Self-measured blood pressure at home

Importance of self-measuring blood pressure

Measuring your blood pressure at home and sharing measurements with your doctor has been shown to improve blood pressure control. By providing your doctor with more blood pressure measurements than would normally be taken in the office, your doctor will have a better idea of how well your diet, exercise and medicines are working to control your high blood pressure when you are not in the office.

This handout will show you how to:

- Choose a home blood pressure monitor
- Measure your blood pressure accurately

Choosing a home blood pressure monitoring device

If you are buying your own blood pressure monitor for home use, there are a few points to consider:

- Most upper arm home blood pressure monitors cost \$50 to \$100.
- Using wrist and finger cuffs on blood pressure monitors are less accurate and not recommended.
- Monitors are available with larger displays that are easier to read.
- If you enjoy technology, some monitors can connect with your smart phone and track your blood pressure readings.
- Always purchase a monitor that has the correct size cuff for your arm.

Recommended cuff sizes for accurate measurement of blood pressure

Arm circumference	Cuff size
22 to 26 cm	12 x 22 cm (small adult)
27 to 34 cm	16 x 30 cm (adult)
35 to 44 cm	16 x 36 cm (large adult)

There are many blood pressure monitors to choose from. Always select a blood pressure monitor that has been certified (confirmed to be accurate) by one of these three respected organizations:

- Association for the Advancement of Medical Instrumentation
- British Hypertension Society
- European Society of Hypertension

Additional certified monitors can be found on the internet at <http://tinyurl.com/mxuvn7v>.

If you buy your own device, consider taking it to your doctor's office and ask them to check the accuracy of your machine.

Measuring your blood pressure accurately

You will need to follow certain steps to help make sure that you are measuring your blood pressure accurately. Your doctor or care team may also give you instructions on how often to take your blood pressure. Always follow the advice of your doctor. Most of the time you will take two blood pressure measurements in the morning and two more in the evening for one to two weeks. You should plan to review these results with your doctor or a member of your doctor's staff. This can be done through a phone call, an office visit or using a patient portal on a computer if that is available to you.

To measure blood pressure correctly, there are things you should, and should not, do. Follow these guidelines to help make sure that you measure your blood pressure accurately every time. If you are sharing your machine with another family member or friend, remember to follow the manufacturer's instructions for changing the user.

Before you take your blood pressure:

- Do not exercise, eat a large meal, use caffeine, drink alcohol or take decongestants for 30 minutes before you take your blood pressure.
- Use the bathroom if you need to before taking your blood pressure.
- Sit quietly in a comfortable position for five minutes without crossing your legs or your ankles.
- Sit with your back supported keeping your feet flat on the floor.

When you are ready to take your blood pressure:

- Continue to sit with your back supported, your legs uncrossed and your feet flat on the floor. Use a step stool if needed to make sure your feet are flat on a surface.
- Following the instructions for your device, put the cuff on by wrapping it around your bare arm above your elbow. Face the palm of your hand up to relax your arm muscles.
- Rest your arm on a table or another flat surface at the level of your heart. Keep it stretched out and relaxed and sit still.
- Do not talk, read, text or watch television while taking your blood pressure.
- Following the directions of the monitor you are using, press the button to start the machine. The cuff will inflate and slowly deflate by itself.

When the machine has stopped taking your blood pressure:

- The machine will display two numbers. The top number is the systolic blood pressure and the bottom number is the diastolic blood pressure. Write down the date, time and result of your blood pressure if your machine does not store that information automatically. If there is a pulse recorded on the display, write that down as well.
- Remove the cuff from your arm and place the device in a safe and dry place.
- Remember to follow the instructions that your doctor or care team gave you for reporting your blood pressures. Take your written blood pressure log or the blood pressure machine with you to your next doctor's office visit if you have been instructed to do so.

For additional information on taking your blood pressure at home, see the "Patient self-measured blood pressure technique" handout.

Self-measured blood pressure technique: How to take your own blood pressure

Before you measure

1. Use a certified, automated device to measure your blood pressure (BP) using your arm (not finger or wrist).
2. Use a cuff that is the right size for your arm.
3. Do not exercise, smoke, eat a large meal, take decongestants or have caffeine within 30 minutes of measuring your blood pressure.
4. Use the bathroom if you need to, before the measurement.
5. Rest for five minutes before measuring your blood pressure.

Position yourself correctly

6. **1** Sit in a chair, with your back supported.
- 2** Sit with your legs uncrossed and feet flat on the floor (or stool).
- 3** Rest your arm on a table close to heart level.
- 4** Place the blood pressure cuff over bare skin, on mid-arm at heart level and just above your elbow.



Perform blood pressure measurement

7. Do not talk, text, read, watch TV or use your phone, computer or tablet while measuring your blood pressure.

8. "Power on" the machine and push the start button.

When the machine stops, write down the upper and lower BP numbers (systolic and diastolic) if the machine does not store them automatically.

Wait one minute and then repeat (some machines will do this automatically). You should always check at least two blood pressure measurements one minute apart and write them down.

9. Take your two blood pressure measurements in the morning and two in the evening for one week, and report them to your doctor's office.



Self-measured blood pressure monitoring at home – flow sheet

Name: _____ Date of birth: _____

Instructions for self-measured blood pressure at home

Decide with your doctor or care team if you should use this form. You may not need to use it if your blood pressure device is able to store your readings and you are able to share those readings with your clinician.

(See “Self-measured blood pressure at home” handout for additional information.)

Rest for five minutes before measuring the first blood pressure

1. Take at least two measurements each time you check your blood pressure and write them down. Wait at least one minute between each measurement.
2. Write any factors you feel may have affected your blood pressure in the comments section.
3. Do this two times a day—once in the morning and once in the evening.
4. Give these numbers to your doctor or clinical office staff in person, during a telephone call or through secure computer messaging.

Morning				Evening		
Date	#1	#2	Comments/average	#1	#2	Comments/average
Day 1						
Day 2						
Day 3						
Day 4						
Day 5						
Day 6						
Day 7						

Morning				Evening		
Date	#1	#2	Comments/average	#1	#2	Comments/average
Day 1						
Day 2						
Day 3						
Day 4						
Day 5						
Day 6						
Day 7						

Copyright 2015 American Medical Association and The Johns Hopkins University. All Rights Reserved. Please feel free to adapt this content to meet the needs of your organization to improve health outcomes solely for non-commercial purposes. Use of the names of the American Medical Association or The Johns Hopkins University or the logos of either beyond use of the names in the required permission statement is not permitted on any adaptations without prior written authorization. The following should appear on the first page or screen of adaptations:

“This [content description, e.g., protocol or checklist] was adapted with permission of the American Medical Association and The Johns Hopkins University. All Rights Reserved. The original copyrighted content can be found at [link].”

Always measure accurately

- Avoid checking your blood pressure if you have eaten a big meal, exercised, smoked, used caffeine or taken decongestants in the past 30 minutes.
- If you need to use the bathroom, do so before you begin.
- Sit quietly for five minutes in a comfortable position.
- Sit in a chair with your back supported.
- Sit with your legs uncrossed and your feet flat on the floor. Use a step stool if necessary to make sure you support your feet on a flat surface.
- Support your arm on a table or other surface at heart level.

How to use this log:

Take your blood pressure as directed by your doctor.

Write down the date and time of your blood pressure measurement in the appropriate column.

Write the top number of your blood pressure reading in the "systolic" column.

Write the bottom number of your blood pressure reading in the "diastolic" column.

Bring this log with you to your doctor visits or communicate the results by telephone or computer.



Self-measured blood pressure patient log



Always measure accurately

- Avoid checking your blood pressure if you have eaten a big meal, exercised, smoked, used caffeine or taken decongestants in the past 30 minutes.
- If you need to use the bathroom, do so before you begin.
- Sit quietly for five minutes in a comfortable position.
- Sit in a chair with your back supported.
- Sit with your legs uncrossed and your feet flat on the floor. Use a step stool if necessary to make sure you support your feet on a flat surface.
- Support your arm on a table or other surface at heart level.

How to use this log:

Take your blood pressure as directed by your doctor.

Write down the date and time of your blood pressure measurement in the appropriate column.

Write the top number of your blood pressure reading in the "systolic" column.

Write the bottom number of your blood pressure reading in the "diastolic" column.

Bring this log with you to your doctor visits or communicate the results by telephone or computer.



Self-measured blood pressure patient log



Always measure accurately

- Avoid checking your blood pressure if you have eaten a big meal, exercised, smoked, used caffeine or taken decongestants in the past 30 minutes.
- If you need to use the bathroom, do so before you begin.
- Sit quietly for five minutes in a comfortable position.
- Sit in a chair with your back supported.
- Sit with your legs uncrossed and your feet flat on the floor. Use a step stool if necessary to make sure you support your feet on a flat surface.
- Support your arm on a table or other surface at heart level.

How to use this log:

Take your blood pressure as directed by your doctor.

Write down the date and time of your blood pressure measurement in the appropriate column.

Write the top number of your blood pressure reading in the "systolic" column.

Write the bottom number of your blood pressure reading in the "diastolic" column.

Bring this log with you to your doctor visits or communicate the results by telephone or computer.



Self-measured blood pressure patient log

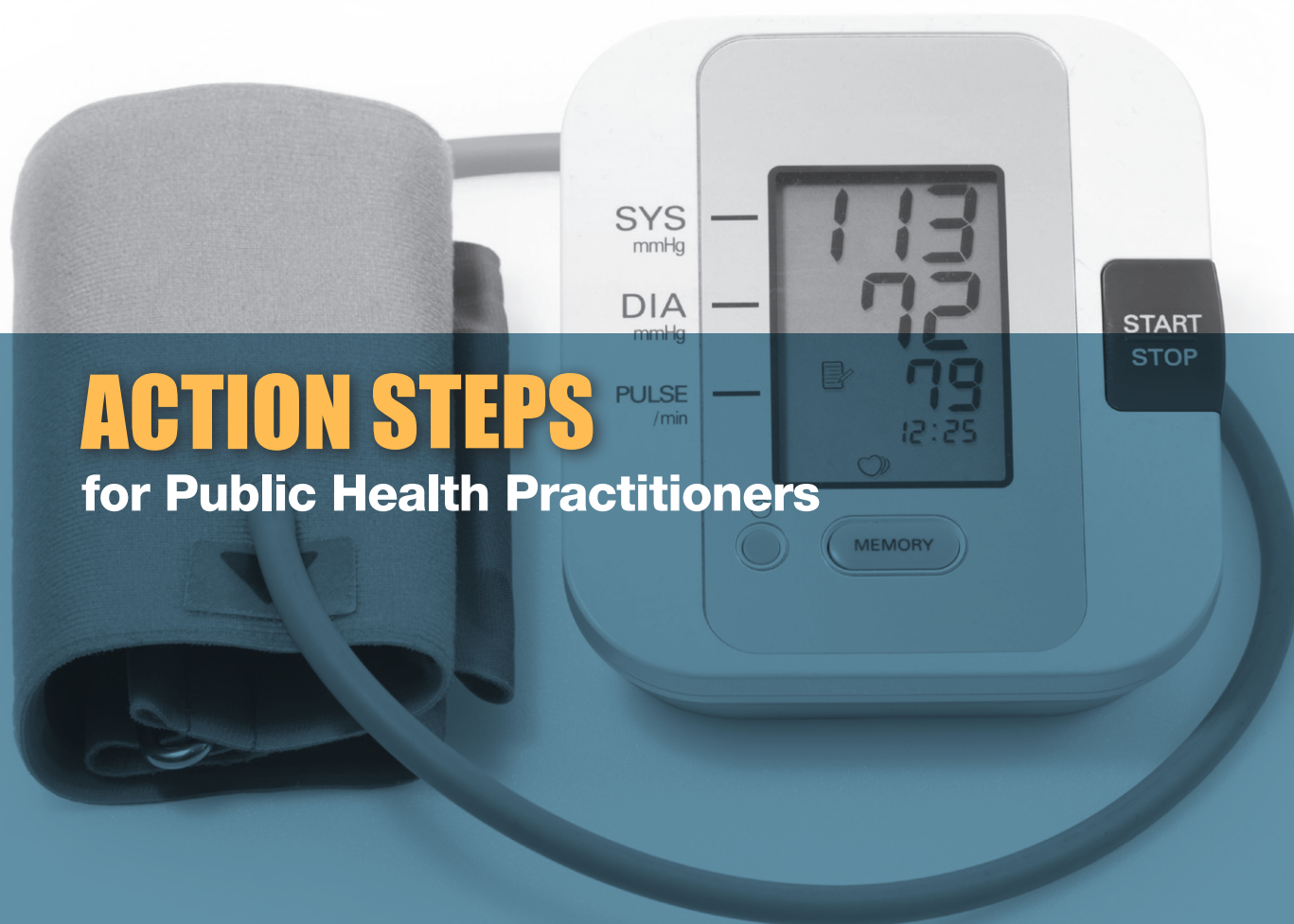


Copyright 2015 American Medical Association and The Johns Hopkins University. All Rights Reserved. Please feel free to adapt this content to meet the needs of your organization to improve health outcomes solely for non-commercial purposes. Use of the names of the American Medical Association or The Johns Hopkins University or the logos of either beyond use of the names in the required permission statement is not permitted on any adaptations without prior written authorization. The following should appear on the first page or screen of adaptations:

"This [content description, e.g., protocol or checklist] was adapted with permission of the American Medical Association and The Johns Hopkins University. All Rights Reserved. The original copyrighted content can be found at [link]."



Self-Measured **Blood Pressure** Monitoring



ACTION STEPS for Public Health Practitioners

Acknowledgments

We would like to extend special thanks to the following individuals for their assistance in the development and review of this document:

Agency for Healthcare Research and Quality

Elisabeth Kato, MD, MRP

America's Health Insurance Plans

Casey Korba, MS

Barbara Lardy, MPH

Centers for Disease Control and Prevention

Diane Beistle, BA

Kathy Harben, BA

Stephanie Bernard, PhD, MPH

Yuling Hong, MD, PhD

Nicole Blair, MPH

Megan C. Lindley, MPH*

Barbara Bowman, PhD

Anne Lutz, MPH

Peter Briss, MD, MPH

Cynthia Morrison, MSPH

Valerie Edelheit, MSPH

Monica Ponder, MS, MSPH

Nicole Flowers, MD, MPH

Linda Redman, MPH, MA

Mary George, MD, MSPH, FACS, FAHA

Michael Schooley, MPH

Siobhan Gilchrist, JD, MPH

Amy Valderrama, PhD, RN, ACNP-BC

Allison Goldstein, MPH*

Jennifer VanderVeur, JD

Janelle Gunn, MPH, RD

Hilary K. Wall, MPH*

Carol Hamilton, EdD, PA-C

Guijing Wang, PhD

Judy Hannan, MPH, RN

Janet Wright, MD

Centers for Medicare and Medicaid Services

Marsha Davenport, MD

Cynthia Pamon, RN, MBA, MSHCAD, CCM

Jacqueline Higgins, BA, PHI-C

Health Resources and Services Administration

Preeta Chidambaran, MD, MPH

National Association of Chronic Disease Directors

Margaret Casey, RN, MPH

Miriam Patanian, MPH

National Institutes of Health, National Heart, Lung, and Blood Institute

Anne Rancourt, MPS

* Denotes guide preparers

For More Information

Allison Goldstein, MPH

Division for Heart Disease and Stroke Prevention

Centers for Disease Control and Prevention

agoldstein@cdc.gov

Suggested Citation

Centers for Disease Control and Prevention. *Self-Measured Blood Pressure Monitoring: Action Steps for Public Health Practitioners*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.

Contents

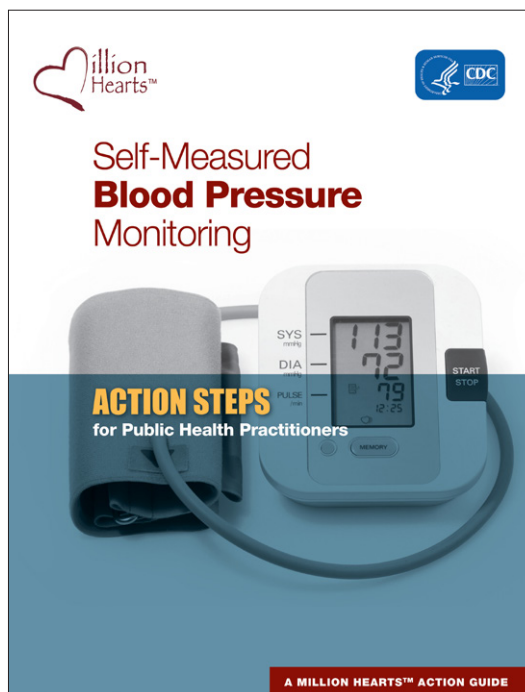
Executive Summary	1
Burden of Hypertension	2
Self-Measured Blood Pressure Monitoring	3
Additional Support Strategies for SMBP	4
Home Blood Pressure Monitors Used for SMBP	6
Cost of SMBP Plus Additional Support	6
Health Insurance Coverage for SMBP	8
Action Steps for Public Health Practitioners	9
1. Explore the Environment	9
2. Work with Payers and Purchasers	9
3. Work with Health Care Providers	9
4. Help Spread the Word to the Public	10
5. Monitor and Assess Progress	10
Resources	11
References	14
Appendix A: Medicaid Benefits for Self-Measured Blood Pressure Monitoring Plus Additional Support, by State	17
Appendix B: Top Five Insurance Plans in Each State for Managed Care Enrollment, by Market Share, Atlantic Information Services, Inc. Directory of Health Plans, 2011	21

Executive Summary

Million Hearts™ is a U.S. Department of Health and Human Services initiative that is co-led by the Centers for Disease Control and Prevention and the Centers for Medicare & Medicaid Services, with the goal of preventing one million heart attacks and strokes by 2017. To help achieve this goal, Million Hearts™ aims to increase by 10 million the number of persons in the United States whose blood pressure is under control.¹ Self-measured blood pressure monitoring (SMBP) plus additional support is one strategy that can be implemented in communities to reduce the risk of disability or death due to high blood pressure. SMBP is defined as the regular measurement of blood pressure by the patient outside the clinical setting, either at home or elsewhere. It is sometimes known as “home blood pressure monitoring.” Additional support includes regular one-on-one counseling, Web-based or telephonic support tools, and educational classes and is further defined on page 4.

This document provides action steps and resources for public health practitioners on self-measured blood pressure monitoring and is not meant to represent clinical recommendations or guidelines. It includes:

- ▷ A description of the burden of hypertension.
- ▷ A summary of the scientific evidence establishing the significance and effectiveness of SMBP plus additional support.
- ▷ A definition and explanation of additional support strategies for SMBP.
- ▷ Types and costs of home blood pressure monitors used for SMBP.
- ▷ Available cost data for SMBP plus additional support interventions.
- ▷ Health insurance coverage for SMBP.



- ▷ Action steps for public health practitioners on the implementation of SMBP plus additional support.

This document provides action steps for public health practitioners to facilitate the implementation of SMBP plus additional support in five key areas: understanding the environment, working with payers and purchasers, working with health care providers, spreading the word to the public, and monitoring/assessment of SMBP plus additional support implementation. For each area, relevant actions are given that can facilitate the implementation of SMBP plus additional support. A subsequent list of related electronic resources is also provided to assist with these actions, along with appendices that describe state-specific Medicaid coverage for blood pressure monitors and additional support as well as the top five insurance plans by market share in each state.

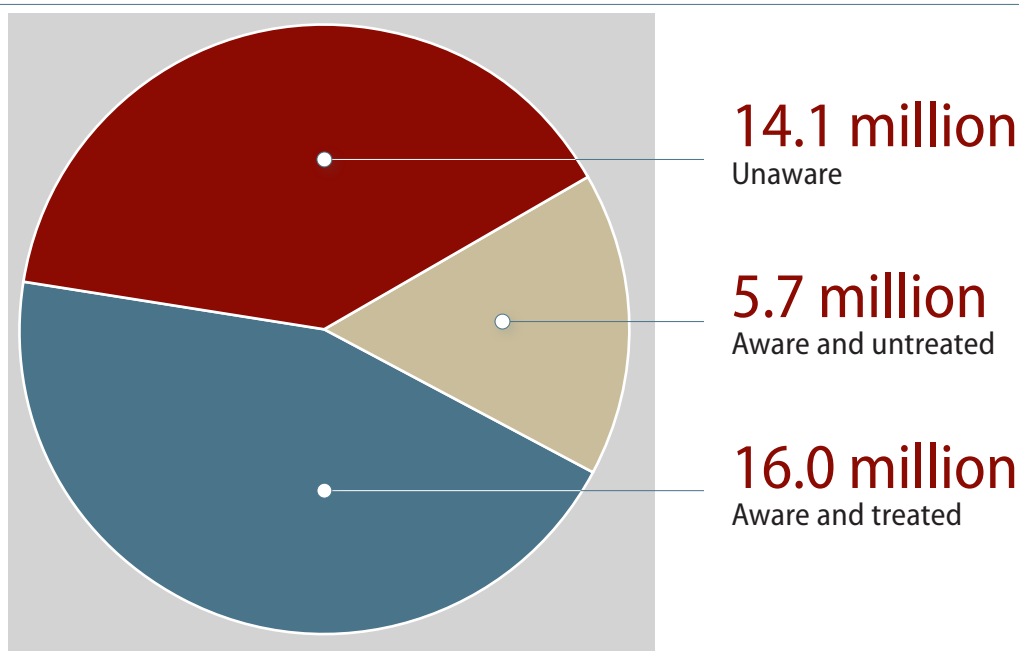
Burden of Hypertension

High blood pressure, or hypertension (HTN), is a major risk factor for heart disease, stroke, and kidney disease. It affects nearly one-third of American adults aged 18 or older (67 million people).² HTN is generally defined as systolic blood pressure (SBP) of 140 mm Hg or higher or diastolic blood pressure (DBP) of 90 mm Hg or higher.² HTN is more common among adults aged 65 years or older; Medicare beneficiaries, including people under 65 with end-stage renal disease³; and non-Hispanic blacks.⁴ HTN is uncontrolled in more than half of adults with the condition, or 36 million people.² Only 61% of adults with uncontrolled HTN are aware they have HTN, and just under half (45%) of the uncontrolled both know they have HTN and are being treated with medications to lower their blood pressure (Figure 1).² Uncontrolled HTN is associated with increased cardiovascular morbidity and mortality and increased use of health care resources,⁵ with direct health care costs related to HTN amounting to approximately \$131 billion each year.⁶ Moreover, treatment for cardiovascular

disease is estimated to account for 12% of annual spending by both private insurers and Medicaid, and nearly 30% of annual Medicare spending.⁷ Even small increases in blood pressure increase the risk for cardiovascular disease and mortality: the risk of death from ischemic heart disease and stroke doubles for every 20 mm Hg increase in SBP, or 10 mm Hg increase in DBP.^{2,5}

Effective management and control of HTN can reduce the risks of heart attack, stroke, and heart failure.⁵ Although lifestyle changes such as eating a healthy, low-sodium diet, getting more exercise, and quitting smoking may result in small decreases in blood pressure, people with HTN generally also require one or more medications to lower their blood pressure.⁵ Clinical trials have shown that blood pressure medications have the potential to reduce the incidence of stroke by 35%–40%, heart attacks by 20%–25%, and heart failure by 50%.⁵ However, HTN usually requires lifetime management, and maintaining long-term medication adherence and lifestyle modification can be challenging for patients.⁸

Figure 1.
Awareness and treatment
among adults aged 18 or
older with uncontrolled
hypertension, National
Health and Nutrition
Examination Survey
(NHANES) 2003–2010²



Self-Measured Blood Pressure Monitoring

Clinicians, public health practitioners, health care systems, and individuals can focus on strategies to improve blood pressure control and medication adherence in order to improve health outcomes for patients with HTN.^{2,8} One strategy that is being promoted by numerous national and international health organizations is SMBP.^{8,9} SMBP technically refers to the regular measurement of a patient's own blood pressure. Though there are multiple settings where blood pressure can be measured, such as a health care setting, senior center, pharmacy, church, or fire station, SMBP more broadly refers to the regular use of a personal blood pressure measurement device that is used by the patient outside a clinical setting.⁸ While these devices may be used in settings such as a workplace or church, they are typically used at home and often referred to as home blood pressure monitors.⁸ SMBP differs from ambulatory blood pressure monitoring, which is also done outside the clinical setting. Ambulatory blood pressure monitoring is performed continuously over a 24-hour period with an ambulatory blood pressure monitor, while SMBP uses a home blood pressure monitor to measure blood pressure at different points in time.⁹ Although more research is needed to determine the optimal timing and frequency of measurements, experts, including the American Heart Association (AHA), European Hypertension Society (EHS), and British Hypertension Society (BHS), recommend that patients using SMBP take two or three successive readings (at one-minute intervals) at least twice a day, once in the morning and once in the evening. The number of measurements per week should be determined together with the patient's health care provider.^{9–12}

The Agency for Healthcare Research and Quality (AHRQ) recently reviewed the effectiveness of

SMBP.⁸ The review examined 49 studies, including 24 that compared SMBP plus additional support to usual care. Patients receiving usual care had their blood pressure measured only at routine appointments with their primary care providers and did not receive extra guidance on measurement or control of blood pressure from study personnel. Patients using SMBP measured blood pressure at home only; readings were either taken themselves or by a caretaker. AHRQ found strong evidence that SMBP plus additional support (defined below) was more effective than usual care in lowering blood pressure among patients with HTN.⁸ In the studies examined by AHRQ that reported statistically significant reductions in blood pressure favoring SMBP plus additional support, the mean net decrease in SBP ranged from 1.6 to 8.5 mm Hg and the mean net decrease in DBP ranged from 1.9 to 4.4 mm Hg.^{4,13–24}

AHRQ found strong evidence that SMBP plus additional support was more effective than usual care in lowering blood pressure among patients with hypertension.

For the purposes of the review, AHRQ did not include blood pressure measurement by the patient in an office, clinic, pharmacy, or workplace health unit because those measurements do not address white coat HTN issues (this refers to artificially high readings when blood pressure is measured in a physician's office) or provide opportune conditions for the measurement frequency recommended for home self-measurement.⁸

Additional Support Strategies for SMBP

The type of additional support in the studies examined by AHRQ varied widely and fell into three main categories: regular one-on-one counseling,^{4,13,14,16,20,22} Web-based or telephonic support tools that did not involve one-on-one interaction,^{15–17,19,21,23} and educational classes.^{14,18,24}

- ▷ **One-on-one counseling:** examples included regular telephone calls from nurses to manage blood pressure-lowering medication²⁰ and in-person counseling sessions with trained community pharmacists.²²
- ▷ **Web-based or telephonic support:** examples included an interactive computer-based telephone feedback system¹⁵ and secure patient website training plus pharmacist care management delivered through Web communications,¹⁶ both in response to patient-reported blood pressure readings.
- ▷ **Educational classes:** examples included telephone-based education by nurses on blood pressure-lowering behaviors delivered only when patients reported poor blood pressure readings¹⁴ and small-group classes on SMBP technique and lifestyle changes that help lower blood pressure, taught by physician assistants.¹⁸

Determining whether one form of support is more effective than another is not possible from the AHRQ review because the details of additional support interventions differed widely from study to study.⁸ However, with one exception, all forms of additional support in the trials that successfully lowered patients' blood pressure were administered by health care providers (e.g., pharmacists, nurse practitioners, physician assistants) specifically trained to deliver the intervention, and the content was adjusted based on blood pressure readings reported by patients using SMBP. Upon additional analysis of the effective SMBP plus additional support interventions in the AHRQ review, multiple common elements were noted across all of the interventions (See Common Elements of Successful SMBP Support).^{4,13–24}

If maintained over time, interventions using SMBP plus additional support could contribute to improved blood pressure control for many patients with HTN. Because the delivery and components of successful SMBP plus additional support interventions examined in the AHRQ review varied widely, it is possible that this flexibility would allow interventions to be implemented across numerous health care settings and patient populations. However,

Common Elements of Successful SMBP Support

Many different kinds of SMBP plus additional support interventions have successfully lowered blood pressure in patients with HTN. Common elements of successful SMBP plus additional support interventions are^{4,13–24}:

- ▶ Delivery of intervention by trained health care providers (e.g., pharmacists, nurse practitioners, physician assistants, health educators).
- ▶ Regular patient communication of SMBP readings to providers.
- ▶ A patient/provider “feedback loop” in which provider support and advice are customized based on patients' reported information (see Figure 2).

more formal evaluation of these approaches is needed. Some studies suggest that when SMBP monitoring is done at home, it could help reduce HTN-related disparities among vulnerable populations because health care providers can collect information about patients' blood pressure, medications, and health behaviors without requiring them to pay for and travel to a doctor's office for every blood pressure reading.^{4,14–21}

A Joint Scientific Statement from the AHA, American Society of Hypertension (ASH), and Preventive Cardiovascular Nurses Association (PCNA) states that SMBP may be particularly useful in certain types of patients, including the elderly, people with diabetes or chronic kidney disease, pregnant women, and patients with suspected or confirmed white coat HTN.⁹ However, patients with atrial fibrillation or other

All forms of additional support in the trials were administered by health care providers specifically trained to deliver the intervention, and the content was adjusted based on blood pressure readings reported by patients using SMBP.

types of irregular heartbeat (generally known as arrhythmias) may have difficulty taking accurate readings using automated home blood pressure monitors.⁹

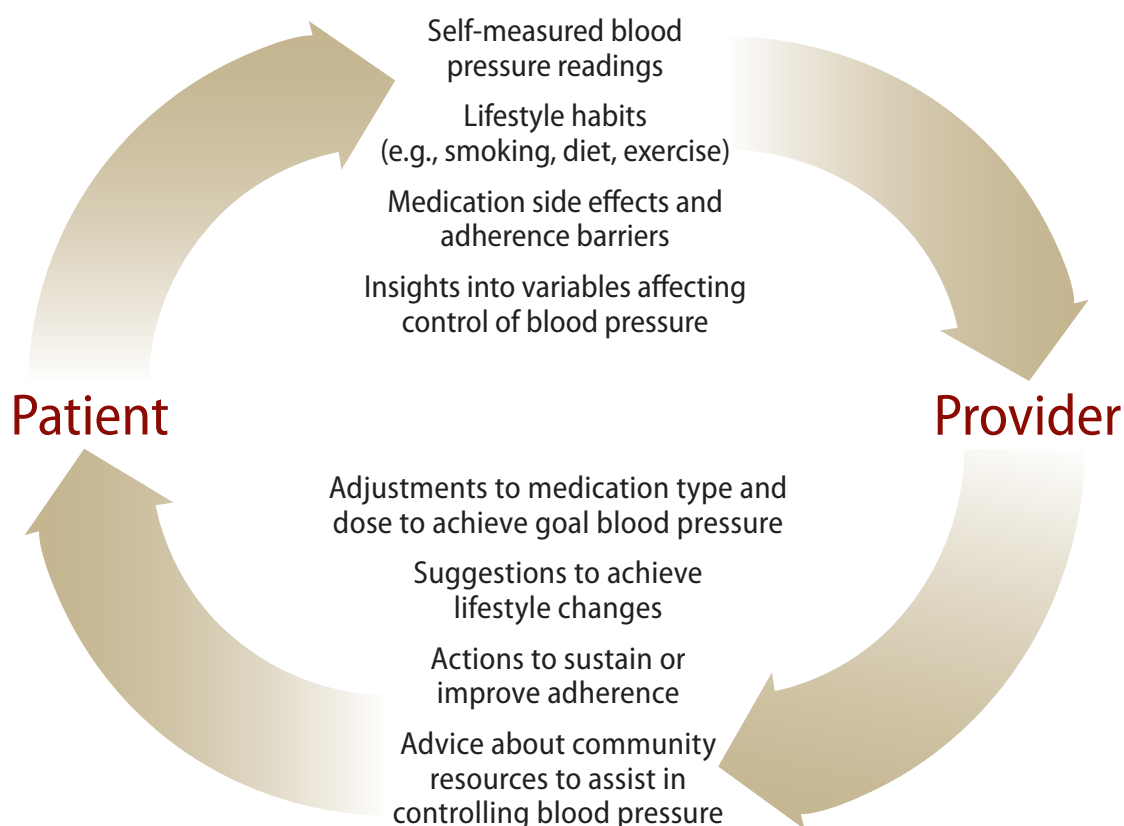


Figure 2. Feedback loop between patients and health care providers supporting SMBP

Home Blood Pressure Monitors Used for SMBP

Available home blood pressure monitors range from manual devices that require patients to measure blood pressure with a stethoscope and sphygmomanometer (auscultatory) to devices that are partially or fully automated (oscillometric). No studies directly compare different SMBP devices, but automated devices are likely to be easier to use,⁹ and most recent studies used automated devices.⁸ Although monitors that fit on the upper arm, wrist, and finger are available, upper arm monitors are recommended by AHA, ASH, and PCNA for accuracy of measurement.^{8,9} Patients should only use monitors that have been properly validated and tested for accuracy, passing at least one accepted standardized international testing protocol. The three widely accepted validation protocols are from the Association for the Advancement of Medical Instrumentation (AAMI), the BHS, and the EHS. Not all available home blood pressure monitors have passed these validation tests (see Resources section for links to current lists). For a validated upper arm home blood pressure monitor,

patients should expect to pay in the range of \$50 to \$100.^{9,25} For a summary of preferred home blood pressure monitor features outlined in the Joint Scientific Statement from AHA, ASH, and PCNA, see Table 1.

Cost of SMBP Plus Additional Support

In addition to the cost of home blood pressure monitors, the costs of supporting interventions should be considered. Although several studies have examined SMBP with additional support, few data are available on the cost of the added interventions. Among the studies of effective SMBP plus additional support interventions included in the AHRQ review, fewer than half included information on intervention costs. In studies that examined cost, the amount per patient ranged from slightly more than \$100 to nearly \$1,000 per year in 2011 dollars (after adjustment for inflation).^{13–15,22} The cost of providing additional support to patients using SMBP depends on the type of support offered (see Table 2). For example, interventions that include counseling by health care providers are likely to cost more than automated computer

New Technology in Blood Pressure Monitoring

Increasing use of technology has resulted in many mobile blood pressure monitoring devices that can be used with smartphones, tablets, etc. One example of these devices is a mobile arm cuff that plugs directly into a smartphone and, with a downloadable application, can measure and record blood pressure onto the phone. Multiple companies are beginning to market such devices, some of which are FDA approved or validated with the EHS test protocol. Cuffless blood pressure monitoring using heartbeat and pulse data captured with smartphone microphones is another new technology being developed.²⁶ Most of these strategies have not yet been properly validated by international standards. Another type of device that is widely available is the blood pressure kiosk, often found in pharmacies, worksites, and retail stores. Current kiosks may be inaccurate and unreliable.²⁷ However, the use of more accurate and reliable “smart” blood pressure kiosks is increasing in certain locations. These machines allow patients to save their blood pressure readings and track them over time or share them with their health care providers. Such devices could play a large role in SMBP in the future, but current research in this area is limited.

Table 1. How to choose a home blood pressure monitor⁹

Preferred	Not Preferred
Automated	Manual
Upper arm cuff	Wrist or finger cuff
Validated by AAMI, BHS, or EHS	Not validated
Memory storage capacity	No memory storage
Accuracy checked by physician or nurse after purchase	Patient uses monitor without consulting physician

Table 2. Cost data from studies of SMBP plus additional support

Study	Support Intervention	Cost Results*	Annual Cost per Patient*
Friedman 1996 ¹⁵	Computerized telephone feedback system	\$67 per patient for six months	\$134
Bosworth 2009 ¹³	Behavior counseling by nurses on telephone calls every two months	\$496 per patient for two years	\$248
Zillich 2005 ²²	Face-to-face behavior counseling by pharmacists	\$168 per patient for three months	\$673 [†]
Bosworth 2011 ¹⁴	Behavior counseling by nurses via telephone if triggered by blood pressure readings	\$1,040 per patient for 18 months	\$693
Bosworth 2011 ¹⁴	Combination of behavior counseling and medication management	\$1,268 per patient for 18 months	\$845
Bosworth 2011 ¹⁴	Medication changes by physician after nurse alert if triggered by blood pressure readings	\$1,401 per patient for 18 months	\$934

* Adjusted to 2011 dollars using the medical care component of the Consumer Price Index. Cost data from studies used to generate an annual cost per patient for ease of comparison. All costs include the cost of a blood pressure monitor, except Zillich 2005.

[†] Based on additional pharmacist compensation of \$75/hour and an average time of 100 minutes of counseling per patient. Does not include the cost of a home blood pressure monitor.

support because the cost of the providers' time must be taken into account. The type of provider offering the counseling (e.g., nurse practitioner, pharmacist, physician assistant) and the frequency of counseling (weekly, monthly, bimonthly, or as needed) will also affect the cost of additional support for patients using SMBP. Another factor that influences the cost is whether the intervention results in increased office visits or use of more blood pressure medication (either additional medications, higher doses, or both). Conclusions about how SMBP plus additional support affects health care usage cannot currently be drawn because results from the different studies are not consistent. Additionally, to date, no studies have specifically examined the cost-effectiveness of SMBP plus additional support.

Health Insurance Coverage for SMBP

Although people without health insurance are less likely to have their blood pressure under control, 85% of American adults with uncontrolled HTN have health insurance.² As of 2008, most health plans did not cover at-home SMBP.²⁸ Insurance benefits for SMBP vary by payer: for example, some payers may cover monitors but not additional support services

provided by non-physicians. Experts from AHA, ASH, and PCNA have recommended that payers cover both the purchase of validated home blood pressure monitors and the time that health care providers spend to train patients in SMBP techniques, validate patients' measurement techniques, and interpret and provide counseling based on SMBP readings.⁹

Medicare Part B, that is, traditional fee-for-service Medicare, covers ambulatory blood pressure monitoring and physician interpretation of results for the diagnosis of white coat HTN.⁹ Medicare Part B currently does not cover the home blood pressure monitors used for SMBP. **Medicare Part C**, Medicare Advantage plans, are not required to cover home blood pressure monitors or additional support programs, but may choose to offer these benefits as supplemental coverage for enrollees. In April 2012, the Centers for Medicare and Medicaid Services provided specific guidance to Medicare Advantage organizations on how telemonitoring and other "telehealth" benefits should be constructed, if offered.²⁹ **Medicaid** coverage for home blood pressure monitors and additional support varies by state. Information available on SMBP-related benefits in each state Medicaid program is included in Appendix A.

Experts have recommended that payers cover both the purchase of validated home blood pressure monitors and the time that health care providers spend to train patients in SMBP techniques, validate patients' measurement techniques, and interpret and provide counseling based on SMBP readings.

For **private insurance carriers and self-insured employers**, the decision to cover home blood pressure monitors and additional support is made by each individual plan. Some private insurance plans provide these types of benefits only for beneficiaries who are enrolled in disease-management programs for HTN or other medical conditions that increase the risk of heart disease and stroke. For example, BlueCross BlueShield of Tennessee pays for home blood pressure monitors for patients in its low-risk HTN case-management program if their case managers recommend use of the monitor.²⁸ For patients whose insurance does not cover the purchase

of home blood pressure monitors, the cost of a monitor can be reimbursed from a health care flexible spending account (FSA).³⁰

Action Steps for Public Health Practitioners

Public health practitioners can play an integral role in garnering support and changing systems to assist in the widespread implementation of SMBP plus support programs. Such practitioners can bring partners to the table, share relevant data and information, and make recommendations for changing health care payer and provider systems. To promote SMBP in their communities, public health practitioners may choose to:

1. Explore the Environment

- ▷ Conduct an environmental scan to find existing efforts in your state, county, or municipality that encourage the use of SMBP plus additional support.
- ▷ Determine who the primary stakeholders and potential champions are in your state (e.g., payers, purchasers, health care providers).
- ▷ Understand how state and local laws and regulations relating to scope of practice and licensing of telemedicine providers affect payment for SMBP support programs.

2. Work with Payers and Purchasers

- ▷ Work with state associations of private insurance, groups of self-insured employers, the state Medicaid office, and the state insurance commissioner to encourage coverage of SMBP and additional support.
 - Identify which insurance plans cover the majority of state or county residents and contact benefits managers for these plans to promote coverage for SMBP with additional support (see Appendix B).

- Identify groups of large self-insured businesses (purchasers) and provide resources that promote coverage for SMBP with additional support.
- Encourage coverage for validated SMBP monitors.

- ▷ Share evidence and resources to promote SMBP to payers and purchasers (see Resources section for relevant materials).
- ▷ Identify and share best practices among payers and purchasers in the state for payer- or purchaser-initiated SMBP plus support programs.

3. Work with Health Care Providers

- ▷ Collaborate with state and local chapters of provider organizations, state primary care and other relevant associations, and quality improvement organizations to promote the role of SMBP in clinical management of HTN. State and local public health programs can provide such technical assistance to their partners by:
 - Assisting health care provider groups with identifying SMBP champions in individual medical practices, patient-centered medical home collaboratives, or other quality improvement programs.
 - Encouraging provider groups to offer “train-the-trainer” opportunities to educate team members on how patients should be taught to self-monitor their blood pressure.
 - Providing technical assistance to provider groups on implementing clinical support programs for SMBP (see pages 4–5 of this guide for SMBP support strategies).
- ▷ Share evidence and resources to promote SMBP with health care providers and provider groups (see Resources section for relevant materials).

- ▷ Identify and share best practices for SMBP plus additional support among providers in the state or county.
 - Collaborate with academic detailers to incorporate SMBP plus additional support into training programs.
- ▷ Encourage innovation among health care providers willing to test various models of support for SMBP.
- ▷ Convey lessons learned from work with payers to the providers and, where possible, connect and help convene the payers and providers in a given geography.

4. Help Spread the Word to the Public

- ▷ Encourage health advocacy organizations, community- and faith-based organizations, and patient advocacy groups to share resources to educate the public about the importance of SMBP plus additional support in controlling high blood pressure and to incorporate these messages into broader efforts related to HTN (see Resources section for relevant materials).
- ▷ Include SMBP messaging in communications targeting the public (e.g., media releases, Web pages, Facebook, Twitter chats).

5. Monitor and Assess Progress

- ▷ Evaluate efforts to expand use of SMBP plus additional support.
 - Work with providers and payers implementing SMBP plus additional support to evaluate cost-effectiveness and blood pressure rates and related outcomes.
- ▷ Work with payers and purchasers to examine coverage utilization of SMBP plus additional support.
- ▷ If focusing in a geographic area, consider working with pharmacies that serve the area to assess purchasing trends for blood pressure monitors.
- ▷ Work with providers implementing SMBP plus additional support to monitor changes in blood pressure control rates:
 - The percentage of patients 18–85 years of age who had a diagnosis of HTN and whose blood pressure was adequately controlled (<140/90) during the measurement year.
- ▷ Consider adding questions on SMBP plus additional support to state or local data collection systems or surveys like the Behavioral Risk Factor Surveillance System (BRFSS). For example:
 - (Among self-reported hypertensives) Do you measure your blood pressure at home?
 - If yes, how often do you measure your blood pressure at home? (daily, weekly, monthly, other)
 - (If yes) What type of blood pressure monitor do you use? (manual—with stethoscope and sphygmomanometer, automated—with self-inflating cuff and digital read-out, or hybrid—with manually inflated cuff and digital readout, other)
 - Do you regularly transmit, via e-mail, Internet, phone, or fax, blood pressure readings to a health care provider for feedback?

Resources

List of Validated Home Blood Pressure Monitors

Dabl Educational Website: www.dableducational.org/sphygmomanometers/devices_2_sbpm.html

British Hypertension Society: www.bhsoc.org//index.php?cID=246

Resources for Working with Payers

Appendix A: Medicaid Benefits for Self-Measured Blood Pressure Monitoring plus Additional Support, by State

Appendix B: Top Five Insurance Plans in Each State For Managed Care Enrollment, by Market Share, Atlantic Information Services, Inc. Directory of Health Plans, 2011

List of State/Local Chambers of Commerce: www.uschamber.com/chambers/directory

List of State/Regional Business Coalitions on Health: www.nbch.org/index.asp?bid=67

Medicaid Health Plan Association: www.mhpa.org/Home

Resources for Working with Health Care Providers

AHRQ. Clinician Research Summary: Effectiveness of Self-Measured Blood Pressure Monitoring in Adults with Hypertension: www.effectivehealthcare.ahrq.gov/ehc/products/193/895/smbp_clin_fin_to_post.pdf

American Heart Association. Heart 360. An Online Tool for Patients to Track and Manage Their Heart Health and Share Information with Healthcare Providers: www.heart360.org

American Heart Association. Home Blood Pressure Monitoring Instructional Video: www.heart.org/HEARTORG/Conditions/HighBloodPressure/SymptomsDiagnosisMonitoringofHighBloodPressure/Instructional-Video---Monitoring-Blood-Pressure-at-Home_UCM_303324_Article.jsp

American Heart Association. Information on Home Blood Pressure Monitoring and Online and Printable Blood Pressure Tracking Logs: www.heart.org/HEARTORG/Conditions/HighBloodPressure/SymptomsDiagnosisMonitoringofHighBloodPressure/Home-Blood-Pressure-Monitoring_UCM_301874_Article.jsp

American Heart Association. Printable Log to Record Home Blood Pressure Measurements: www.heart.org/idc/groups/heart-public/@wcm/@hcm/documents/downloadable/ucm_305157.pdf

Clinical Advisor. Feature for Providers on How to Implement Home-Measured Blood Pressure Monitoring: www.clinicaladvisor.com/how-to-implement-home-bp-monitoring/article/206808

Drug Store News. Pharmacy Practice: Helping Patients Navigate At-Home Blood Pressure Monitoring: A Discussion Guide for Physicians and Patients on Home Blood Pressure Monitoring: www.cedrugstorenews.com/userapp/lessons/page_view_ui.cfm?lessonuid=401-000-10-010-H01&pageid=A003EC403140DAFB90239918663893C0

Michigan Department of Community Health. Presentation: "Measuring Blood Pressure at Home: A Guide for Healthcare Professionals": www.mpro.org/document_center/Measuring_Blood_Pressure_at_Home_July_18_2012.pptx

Million Hearts Initiative. Team Up. Pressure Down. Resources for Pharmacists: Pharmacist CEUs and Hypertension Awareness-Raising, Discussion, and Management Tools for Patients: <http://millionhearts.hhs.gov/resources/teamuppressuredown.html#Pharmacists>

New York City Department of Health and Mental Hygiene. Patient-Self Monitoring of Blood Pressure: A Provider's Guide: www.nyc.gov/html/doh/downloads/pdf/csi/hyperkit-hcp-bpselfmon-guide.pdf

Washington State Department of Health. How to Check Your Blood Pressure (English): http://here.doh.wa.gov/materials/how-to-check-your-blood-pressure/13_BloodPressHm_E11L.pdf

Washington State Department of Health. How to Check Your Blood Pressure (Spanish): http://here.doh.wa.gov/materials/how-to-check-your-blood-pressure/13_BloodPressHm_S11L.pdf

Washington State Department of Health. Improving the Screening, Prevention, and Management of Hypertension—An Implementation Tool for Clinic Practice Teams: <http://here.doh.wa.gov/materials/bp-management-implementation-tool>

List of Chapters for Health Care Provider Groups

American Academy of Family Physicians: <https://nf.aafp.org/eweb//DynamicPage.aspx?webcode=ChpList&Site=aafpv>

American College of Cardiology: www.cardiosource.org/ACC/ACC-Chapters/ACC-State-Chapters.aspx

American College of Physicians: www.acponline.org/about_acp/chapters/index.html

American Medical Association: www.ama-assn.org/ama/pub/about-ama/our-people/the-federation-medicine/state-medical-society-websites.page

American Nurses Association: www.nursingworld.org/SNAS.aspx

Association of Black Cardiologists: www.abccardio.org (contact for local resources)

National Alliance of State Pharmacy Associations: www.naspa.us/statepharmacy.html

National Black Nurses Association: www.nbna.org/index.php?option=com_qcontacts&view=category&catid=62&Itemid=92

National Hispanic Medical Association: www.nhmamd.org/index.php/membership/council-of-medical-societies

National Hispanic Nurses Association: <http://nahnnet.org/NAHNChapters.html>

National Medical Association: www.nmanet.org/index.php?option=com_content&view=article&id=258&Itemid=350

Preventive Cardiovascular Nurses Association: <http://pcna.net/member-center/chapters>

Quality Improvement Organizations: www.ahqa.org/pub/uploads/FS_QIOContactList_2C.pdf

State Offices and Associations of Rural Health: www.hrsa.gov/ruralhealth/about/directory/index.html

State Primary Care Associations: www.nachc.com/nachc-pca-listing.cfm

Resources for Working with the Public

AHRQ. Measuring Your Blood Pressure at Home: A Review of the Research for Adults:
www.effectivehealthcare.ahrq.gov/ehc/products/193/894/smbp_cons_fin_to_post.pdf

List of State/Local Affiliates for Patient and Community Groups

AARP: www.aarp.org/states

American Heart Association/American Stroke Association: [www.heart.org/HEARTORG/
localization/chooseState.jsp](http://www.heart.org/HEARTORG/localization/chooseState.jsp)

YMCA: www.ymca.net/find-your-y

References

1. Frieden TR, Berwick DM. The “Million Hearts” initiative—preventing heart attacks and strokes. *N Engl J Med*. 2011;365:e27.
2. Valderrama AL, Gillespie C, King SC, George MG, Hong Y, Gregg E. Vital signs: awareness and treatment of uncontrolled hypertension among adults—United States, 2003–2010. *MMWR*. 2012;61:703–9.
3. Gillespie C, Kuklina EV, Briss PA, Blair NA, Hong Y. Vital signs: prevalence, treatment, and control of hypertension—United States, 1999–2002 and 2005–2008. *MMWR*. 2011;60(04):103–8.
4. Artinian NT, Flack JM, Nordstrom CK, Hockman EM, Washington OG, Jen KL, et al. Effects of nurse-managed telemonitoring on blood pressure at 12-month follow-up among urban African Americans. *Nurs Res*. 2007;56(5):312–22.
5. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr., et al; National Heart, Lung, and Blood Institute Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; National High Blood Pressure Education Program Coordinating Committee. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA*. 2003;289(19):2560–72.
6. Heidenreich PA, Trogon JG, Khavjou OA, Butler J, Dracup K, Esekowitz MD, et al. on behalf of the American Heart Association Advocacy Coordinating Committee, Stroke Council, Council on Cardiovascular Radiology and Intervention, Council on Clinical Cardiology, Council on Epidemiology and Prevention, Council on Arteriosclerosis, Thrombosis and Vascular Biology, Council on Clinical Cardiopulmonary, Critical Care, Perioperative and Resuscitation, Council on Cardiovascular Nursing, Council on the Kidney in Cardiovascular Disease, Council on Cardiovascular Surgery and Anesthesia, and Interdisciplinary Council on Quality of Care and Outcomes Research. Forecasting the future of cardiovascular disease in the United States: a policy statement from the American Heart Association. *Circulation*. 2011;123:933–44.
7. Trogon JG, Finkelstein EA, Nwaise IA, Tangka FK, Orenstein D. The economic burden of chronic cardiovascular disease for major insurers. *Health Promot Pract*. 2007;8:234–42.
8. Uhlig K, Balk EM, Patel K, Ip S, Kitsios GD, Obadan NO, et al. *Self-Measured Blood Pressure Monitoring: Comparative Effectiveness*. Comparative Effectiveness Review No. 45. (Prepared by the Tufts Evidence-based Practice Center under Contract No. HHS 290-2007-10055-I.) AHRQ Publication No. 12-EHC002-EF. Rockville, MD: Agency for Healthcare Research and Quality, US Dept of Health and Human Services; 2012. http://www.effectivehealthcare.ahrq.gov/ehc/products/193/893/CER45_SMBP_20120131.pdf. Accessed September 3, 2012.
9. Pickering TG, Miller NH, Ogedegbe G, Krakoff LR, Artinian NT, Goff D. Call to action on use and reimbursement for home blood pressure monitoring: A Joint Scientific Statement from the American Heart Association, American Society of Hypertension, and Preventive Cardiovascular Nurses Association. *Hypertension*. 2008;52:10–29.
10. Pickering TG, White WB. When and how to use self (home) and ambulatory blood pressure monitoring. *J Am Soc Hypertens* 2008; 2(3):119–24.

11. O'Brien E, Asmar R, Beilin L, Imai Y, Mallion JM, European Society of Hypertension Working Group on Blood Pressure Monitoring, et al. European Society of Hypertension recommendations for conventional, ambulatory and home blood pressure measurement. *J Hypertens*. 2003;21:821–48.
12. National Institute for Health and Clinical Excellence. Hypertension: Clinical Management of Primary Hypertension in Adults Web site. <http://guidance.nice.org.uk/CG127>. Accessed December 5, 2012.
13. Bosworth HB, Olsen MK, Grubber JM, Neary AM, Orr MM, Powers BJ, et al. Two self-management interventions to improve hypertension control: a randomized trial. *Ann Intern Med*. 2009;151(10):687–95.
14. Bosworth HB, Powers BJ, Olsen MK, McCant F, Grubber J, Smith V, et al. Home blood pressure management and improved blood pressure control: results from a randomized controlled trial. *Arch Intern Med*. 2011;171(13):1173–80.
15. Friedman RH, Kazis LE, Jette A, Smith MB, Stollerman J, Torgerson J, et al. A telecommunications system for monitoring and counseling patients with hypertension. Impact on medication adherence and blood pressure control. *Am J Hypertens*. 1996;9(4 Pt 1):285–92.
16. Green BB, Cook AJ, Ralston JD, Fishman PA, Catz SL, Carlson J, et al. Effectiveness of home blood pressure monitoring, Web communication, and pharmacist care on hypertension control: a randomized controlled trial. *JAMA*. 2008;299(24):2857–67. [Erratum appears in *JAMA*. 2009;302(18):1972.]
17. McManus RJ, Mant J, Bray EP, Holder R, Jones MI, Greenfield S, et al. Telemonitoring and self-management in the control of hypertension (TASMINH2): a randomised controlled trial. *Lancet*. 2010;376(9736):163–72.
18. Mühlhauser I, Sawicki PT, Didjurgeit U, Jörgens V, Trampisch HJ, Berger M. Evaluation of a structured treatment and teaching programme on hypertension in general practice. *Clin Exp Hypertens*. 1993;15(1):125–42.
19. Rinfret S, Lussier M-T, Peirce A, Duhamel F, Cosette S, Lalonde L, et al. The impact of a multidisciplinary information technology-supported program on blood pressure control in primary care. *Circ Cardiovasc Qual Outcomes*. 2009;2(3):170–7.
20. Rudd P, Miller NH, Kaufman J, Kraemer HC, Bandura A, Greenwald G, et al. Nurse management for hypertension. A systems approach. *Am J Hypertens*. 2004;17(10):921–7.
21. Shea S, Weinstock RS, Starren J, Teresi J, Palmas W, Field L, et al. A randomized trial comparing telemedicine case management with usual care in older, ethnically diverse, medically underserved patients with diabetes mellitus. *J Am Med Inform Assoc*. 2006;13(1):40–51.
22. Zillich AJ, Sutherland JM, Kumbera PA, Carter BL. Hypertension outcomes through blood pressure monitoring and evaluation by pharmacists (HOME study). *J Gen Intern Med*. 2005;20(12):1091–6.
23. Park MJ, Kim HS, Kim KS. Cellular phone and Internet-based individual intervention on blood pressure and obesity in obese patients with hypertension. *Int J Med Inform*. 2009;78(10):704–10.

24. Sawicki PT, Mühlhauser I, Didjurgeit U, Baumgartner A, Bender R, Berger M. Intensified antihypertensive therapy is associated with improved survival in type 1 diabetic patients with nephropathy. *J Hypertens*. 1995;13(8):933–8.
25. Pickering TG. Why is self-monitoring reimbursed for blood glucose but not blood pressure? *J Clin Hypertens (Greenwich)*. 2004;6(9):526–31.
26. Chandrasekaran V, Dantu R, Jonnada S, Thiyagaraja S, Pathapati Subbu K. Cuff-less differential blood pressure estimation using smart phones. *IEEE Trans Biomed Eng*. 2012 Aug 1 [Epub ahead of print].
27. Van Durme DJ, Goldstein M, Pal N, Roetzheim RG, Gonzalez EC. The accuracy of community-based automated blood pressure machines. *J Fam Pract*. 2000;49:449–52.
28. Butcher L. Plans slow to cover at-home BP monitoring. *Manag Care*. 2008;17:35–7.
29. Centers for Medicare and Medicaid Services. Announcement of Calendar Year (CY) 2013 Medicare Advantage Capitation Rates and Medicare Advantage and Part D Payment Policies and Final Call Letter. April 2, 2012. www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Downloads/Announcement2013.pdf. Accessed January 13, 2013.
30. U.S. Department of the Treasury, Internal Revenue Service. Medical and dental expenses (including the health coverage tax credit). IRS Pub. 502. Washington: GPO, 2011. Available at www.irs.gov/publications/p502/index.html. Accessed January 14, 2013.
31. Atlantic Information Services. AIS's Directory of Health Plans Web site.

Appendix A:

Medicaid Benefits for Self-Measured Blood Pressure Monitoring Plus Additional Support, by State

The table below lists state statutes, regulations, and other policy resources in effect in December 2012 pertaining to Medicaid coverage of blood pressure monitors (BPM) and associated support services. Legal researchers used the legal search engine WestlawNext and Google search engine to identify statutes and regulations containing the terms: blood pressure monitor, durable medical equipment, telemedicine, and Medicaid. The search results for regulations were filtered using three separate search terms to determine relevancy: HCPCS (Healthcare Common Procedure Coding System), blood pressure, and telemedicine. State policies providing general coverage of

telemedicine services are listed as support services, though few states provide specific coverage for blood pressure telemedicine. While every effort has been made to identify relevant state policies, the content below might not reflect all relevant policies for any given jurisdiction. Furthermore, many state policies do not explicitly list all medical products and services covered by Medicaid, yet some products and services may be available if medically necessary pursuant to physician order. Additional information may be found through other legal search engines, such as StateNet, LexisNexis, CQ State Track, or others, as well as through state legislative and regulatory websites.

State	Legal and Policy Citations	Types of BPM Covered by Medicaid	Additional Support for BPM Covered by Medicaid
Alabama	Ala. Admin. Code r. 560-X-13.01 (2012); Alabama Medicaid Provider Manual, ch. 14 <i>Durable Medical Equipment (DME)</i> ; App. P <i>Durable Medical Equipment (DME) Procedure Code and Modifiers</i> (Oct. 2012)	Not specified ^{a,b}	— ^c
Alaska	Alaska Admin. Code tit. 7 § 120.200 (2010); Alaska Admin. Code tit. 7 § 120.210(b) (2010); Alaska Admin. Code tit. 7 § 160.900(a)(2) (2010)	A4660 ^d A4663 ^e A4670 ^f	— ^c
	Alaska Admin. Code tit. 7 § 110.625(a)(3) (2010)	— ^c	Telemedicine services for self-monitoring
Arizona	No applicable statutes or regulations found		
Arkansas	Ark. Admin. Code 016.06.48-242.140 (2007)	A4670 ^f	— ^c
California	No applicable statutes or regulations found		
Colorado	Colo. Rev. Stat. Ann. § 25.5-5-414 (West 2008); Colo. Rev. Stat. Ann. § 25.5-5-320 (West 2008); 10 Colo. Code Regs. 2505-10:8.525.15 (2007)	— ^c	Telemedicine services
Connecticut	No applicable statutes or regulations found		
Delaware	No applicable statutes or regulations found		
District of Columbia	DC MMIS Provider Billing Manual, <i>DME/POS Billing Manual</i> , v2.03 (Sept. 2012) & DC ST § 4-204.05 (2007)	Not specified ^{a,b}	— ^c

State	Legal and Policy Citations	Types of BPM Covered by Medicaid	Additional Support for BPM Covered by Medicaid
Florida	<i>Florida Medicaid Provider Reimbursement Handbook</i> , ch. 2, 97 (2010); see also Fla. Admin. Code r. 59G-4.001 & 59G-4.070 (2010)	Non-covered ^g	— ^c
Georgia	Georgia Department of Community Health, <i>Georgia Medicaid State Plan under Title XIX of the Social Security Act</i> , Attachment 3: Amount, Duration, and Scope of Services, p. 3b-1 (2009)	Non-covered ^g	— ^c
Hawaii	Haw. Admin. Rules § 17-1737-51.1 (2005)	— ^c	Telemedicine services
Idaho	No applicable statutes or regulations found		
Illinois	Ill. Admin. Code tit. 89, pt. 140.3 & Ill. Admin. Code tit. 89, pt. 140.403 (2012) and <i>Handbook for Providers of Medical Equipment and Supplies</i> , M-203 (2001)	Not specified ^{a,b}	Telemedicine services
Indiana	405 Ind. Admin. Code 5-19-6 (2012)	Not specified ^b	— ^c
	405 Ind. Admin. Code 5-38-1 (2007)	— ^c	Telemedicine services
Iowa	Iowa Admin. Code r. 441-78.10(249A)	A4663 ^e	— ^c
Kansas	Kan. Admin. Regs. § 129-5-108 (2012)	Not specified ^a	— ^c
Kentucky	907 Ky. Admin. Regs. 1:479 (2010) & <i>DME Fee Schedule</i> , revision date Dec. 2010 (2010)	Not specified ^{a,b}	— ^c
	907 Ky. Admin. Regs. 3:170 (2012)	— ^c	Telemedicine services (managed care)
Louisiana	<i>Durable Medical Equipment Provider Manual: Chapter Eighteen of the Medicaid Services Manual</i> , 12 (2010); see also La. Admin. Code tit. 50, pt. II, § 10149	A4660 ^d A4663 ^e A4670 ^f	— ^c
	La. Admin. Code tit. 50, pt. I, § 503 (2005)	— ^c	Telemedicine services
Maine	Code Me. R. 10-144 Ch. 101, Ch. II, § 60 App. (2011) & Code Me. R. 10-144 Ch. 101, Ch. I, § 1.06 (2011)	Not specified ^b	Telemedicine services
Maryland	No applicable statutes or regulations found		
Massachusetts	130 Code Mass. Regs. 603 (2012)	A4660 ^d A4663 ^e A4670 ^f	— ^c
Michigan	No applicable statutes or regulations found		
Minnesota	No applicable statutes or regulations found		
Mississippi	Code Miss. Rules 23-209 (2012)	Not specified ^b	— ^c
Missouri	No applicable statutes or regulations found		
Montana	Mont. Admin. R. 37.86.1802	Not specified ^a	— ^c
Nebraska	471 Neb. Admin. Code § 7-013 (2003)	Covered with limitations	— ^c

State	Legal and Policy Citations	Types of BPM Covered by Medicaid	Additional Support for BPM Covered by Medicaid
Nevada	No applicable statutes or regulations found		
New Hampshire	N.H. Admin. R. Ann. HE-W 571.04, 571.05 & 571.06	Not specified ^b	— ^c
New Jersey	N.J. Admin. Code 10:59-2.3 (2012)	A4660 ^d A4663 ^e A4670 ^f	— ^c
New Mexico	N.M. Code R. § 8.301.2.9 (2008)	Not specified ^a	— ^c
	N.M. Code R. § 8.310.13 (2007)	— ^c	Telemedicine services
New York	No applicable statutes or regulations found		
North Carolina	No applicable statutes or regulations found		
North Dakota	No applicable statutes or regulations found		
Ohio	Ohio Admin. Code 5101:3-10-05	Not specified ^a	— ^c
Oklahoma	No applicable statutes or regulations found		
Oregon	Or. Admin. R. 410-122 (2012)	Not specified ^b	— ^c
	Or. Admin. R. 410-130-0610 (2008)	— ^c	Telemedicine services
Pennsylvania	No applicable statutes or regulations found		
Puerto Rico	No applicable statutes or regulations found		
Rhode Island	No applicable statutes or regulations found		
South Carolina	No applicable statutes or regulations found		
South Dakota	No applicable statutes or regulations found		
Tennessee	No applicable statutes or regulations found		
Texas	1 Tex. Admin. Code § 354.1039 (2012)	Covered with limitations	— ^c
	1 Tex. Admin. Code § 354.1432 (2009)	— ^c	Telemedicine services
Utah	<i>Utah Medicaid Provider Manual</i> , Medical Supplies List, 14 (Oct. 2012); see also Utah Admin. Code r. R414-70-2(6) (2008) & Utah Admin. Code r. R414-1-5(2) (2012)	A4660 ^d A4663 ^e A4670 ^f	— ^c
Vermont	13-170-750 Vt. Code R. § 7505.2 (2012)	BP cuffs/machines (including stethoscopes)	— ^c
Virginia	Virginia Medicaid Provider Manual, App. B15 (2012); see also 12 Va. Admin. Code § 30-50-165 & 12 Va. Admin. Code § 30-60-75	A4660 ^d A4670 ^f (with limitations)	— ^c

State	Legal and Policy Citations	Types of BPM Covered by Medicaid	Additional Support for BPM Covered by Medicaid
Washington	Wash. Admin. Code § 182-543-6000(10) (2011)	Non-covered ^g	— ^c
	Wash. Rev. Code § 74.09.658 (2009) & Wash. Admin. Code § 182-551-2125 (2012)	— ^c	Telemedicine services (i.e., home health BP monitoring)
West Virginia	Bureau for Medical Services Provider Manual, § 506.2.2 (2008); also see W. Va. Code R. § 11-15B-2(c)(18) (2006) & W. Va. Code R. § 11-15-9i (2007)	Non-covered ^g	— ^c
Wisconsin	No applicable statutes or regulations found		
Wyoming	Durable Medical Equipment Provider Manual, <i>Medical Supplies and Equipment: Covered Services and Limitations Module</i> , 15 (2009); also see Wyo. Admin. Code HLTH MD CD Ch. 11 § 5 (2005)	A4660 ^d A4663 ^e A4670 ^f	— ^c

^a Not specified: The provision does not list covered items.

^b Not specified: BPM or telemedicine is not among the listed covered items, but also not listed under non-covered items.

^c—: Indicates that no provision was identified.

^dA4660: HCPCS code for mercury sphygmomanometer with a cuff and stethoscope.

^eA4663: HCPCS code for BP cuff only.

^fA4670: HCPCS code for automated BP monitor.

^gNon-covered: The item is specifically excluded from covered items.

Note: State law references to telehealth are reported as telemedicine in this table.

Appendix B:

Top Five Insurance Plans in Each State for Managed Care Enrollment, by Market Share, Atlantic Information Services, Inc. Directory of Health Plans, 2011³¹

ALABAMA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of Alabama	80.9
2	Patient 1st	9.8
3	Viva Health, Inc.	1.9
4	Blue Cross and Blue Shield of Illinois	1.3
5	CIGNA HealthCare, Inc.	1.3
	Other	4.8

ALASKA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Premera Blue Cross	53.7
2	Aetna	22.9
3	CIGNA HealthCare, Inc.	7.7
4	ODS Companies, The	6.0
5	Providence Health Plan	3.5
	Other	6.2

ARIZONA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross Blue Shield of Arizona	26.6
2	Aetna	12.1
3	United Healthcare	10.8
4	Mercy Care Plan	9.7
5	CIGNA HealthCare, Inc.	9.6
	Other	31.2

ARKANSAS

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Arkansas BlueCross BlueShield	39.6
2	Connect Care	27.9
3	HMO Partners, Inc.	10.1
4	CIGNA HealthCare, Inc.	4.9
5	QCA Health Plan, Inc.	4.8
	Other	12.7

CALIFORNIA

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Kaiser Foundation Health Plan, Inc.	26.0
2	WellPoint, Inc.	23.1
3	Blue Shield of California	11.4
4	Health Net, Inc.	8.6
5	Aetna	5.8
	Other	25.1

COLORADO

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Kaiser Foundation Health Plan of Colorado, Inc.	22.4
2	CIGNA HealthCare, Inc.	19.1
3	WellPoint, Inc.	18.2
4	Aetna	12.0
5	Rocky Mountain Health Plans	8.0
	Other	20.3

CONNECTICUT

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	WellPoint, Inc.	22.4
2	Aetna	20.4
3	CIGNA HealthCare, Inc.	18.5
4	Community Health Network of Connecticut, Inc. (CHNCT)	14.8
5	ConnectiCare, Inc.	10.6
	Other	13.3

DELAWARE		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Aetna	36.0
2	Blue Cross Blue Shield of Delaware	34.6
3	Coventry Health and Life Insurance Company	12.4
4	United Healthcare	8.6
5	CIGNA HealthCare, Inc.	3.2
	Other	5.3

DISTRICT OF COLUMBIA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	CareFirst BlueCross BlueShield	90.2
2	Chartered Health Plan, Inc., The	3.4
3	United Healthcare	2.0
4	Aetna	2.0
5	Kaiser Foundation Health Plan of the Mid-Atlantic States, Inc.	1.3
	Other	1.2

FLORIDA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of Florida, Inc.	28.3
2	Aetna	13.9
3	CIGNA HealthCare, Inc.	10.4
4	Humana Inc.	8.1
5	Florida MediPass	6.5
	Other	32.8

GEORGIA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	WellPoint, Inc.	23.4
2	Aetna	13.6
3	WellCare Health Plans, Inc.	13.4
4	CIGNA HealthCare, Inc.	11.3
5	Centene Corporation	7.3
	Other	31.1

HAWAII		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Hawaii Medical Service Association	59.4
2	Kaiser Foundation Health Plan of Hawaii	19.9
3	AlohaCare	6.9
4	Hawaii Medical Assurance Association (HMAA)	3.7
5	United Healthcare	3.2
	Other	7.0

IDAHO		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross of Idaho Health Service, Inc.	41.0
2	Regence BlueShield of Idaho	20.7
3	Healthy Connections	18.2
4	Aetna	4.5
5	Group Health Cooperative	4.4
	Other	11.3

ILLINOIS		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of Illinois	47.0
2	Illinois Health Connect	21.3
3	United Healthcare	9.0
4	Aetna	6.3
5	CIGNA HealthCare, Inc.	5.4
	Other	11.0

INDIANA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	WellPoint, Inc.	50.5
2	CIGNA HealthCare, Inc.	12.3
3	MDWise	7.8
4	Blue Cross and Blue Shield of Illinois	5.3
5	Centene Corporation	5.3
	Other	18.7

IOWA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Wellmark Blue Cross and Blue Shield of Iowa	70.4
2	Iowa MediPASS	10.7
3	Blue Cross and Blue Shield of Illinois	3.5
4	Aetna	3.1
5	CIGNA HealthCare, Inc.	2.6
	Other	9.8

KANSAS		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of Kansas	46.1
2	Blue Cross and Blue Shield of Kansas City	13.9
3	Family Health Partners	8.1
4	Aetna	7.4
5	CIGNA HealthCare, Inc.	6.6
	Other	18.0

KENTUCKY		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	KenPAC PCCM Managed Care Program	25.8
2	WellPoint, Inc.	20.3
3	Humana Inc.	13.7
4	Bluegrass Family Health, Inc.	13.1
5	AmeriHealth Mercy Family of Companies	7.2
	Other	19.8

LOUISIANA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of Louisiana	65.7
2	Humana Inc.	7.4
3	CIGNA HealthCare, Inc.	6.5
4	Aetna	6.4
5	Blue Cross and Blue Shield of Texas	4.2
	Other	9.7

MAINE

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	MaineCare	38.0
2	WellPoint, Inc.	26.3
3	Aetna	14.5
4	CIGNA HealthCare, Inc.	8.5
5	Harvard Pilgrim Health Care, Inc.	7.6
	Other	5.0

MARYLAND

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Aetna	19.9
2	CareFirst BlueCross BlueShield	17.7
3	United Healthcare	11.8
4	Kaiser Foundation Health Plan of the Mid-Atlantic States, Inc.	10.7
5	CIGNA HealthCare, Inc.	9.1
	Other	30.8

MASSACHUSETTS

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross Blue Shield of Massachusetts	45.6
2	Harvard Pilgrim Health Care, Inc.	14.9
3	Tufts Associated Health Plans, Inc.	10.7
4	Primary Care Clinician Plan	4.9
5	Boston Medical Center HealthNet Plan	4.1
	Other	19.9

MICHIGAN

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross Blue Shield of Michigan	57.3
2	Priority Health	7.8
3	Health Alliance Plan of Michigan	6.2
4	Aetna	3.8
5	Health Plan of Michigan, Inc.	3.6
	Other	21.4

MINNESOTA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of Minnesota	44.0
2	Medica Health Plans	29.3
3	HealthPartners, Inc.	14.6
4	UCare	3.5
5	CIGNA HealthCare, Inc.	1.9
	Other	6.8

MISSISSIPPI		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross & Blue Shield of Mississippi	56.4
2	CIGNA HealthCare, Inc.	12.5
3	Aetna	9.2
4	Blue Cross and Blue Shield of Illinois	5.8
5	BlueCross BlueShield of Tennessee	5.6
	Other	10.5

MISSOURI		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of Kansas City	22.6
2	Coventry Health and Life Insurance Company	16.1
3	CIGNA HealthCare, Inc.	13.8
4	Aetna	11.3
5	Blue Cross and Blue Shield of Illinois	5.2
	Other	30.9

MONTANA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of Montana	46.4
2	CIGNA HealthCare, Inc.	21.0
3	Passport to Health	13.3
4	New West Health Services	7.6
5	Aetna	3.1
	Other	8.6

NEBRASKA

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of Nebraska	65.2
2	United Healthcare	9.5
3	Coventry Health and Life Insurance Company	6.8
4	Aetna	6.8
5	CIGNA HealthCare, Inc.	4.2
	Other	7.6

NEVADA

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	United Healthcare	40.1
2	CIGNA HealthCare, Inc.	18.0
3	Aetna	11.5
4	Hometown Health Plan, Inc.	9.7
5	AMERIGROUP Community Care	7.3
	Other	13.5

NEW HAMPSHIRE

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Harvard Pilgrim Health Care, Inc.	29.2
2	WellPoint, Inc.	23.9
3	CIGNA HealthCare, Inc.	21.2
4	Aetna	10.5
5	MVP Health Care	5.4
	Other	9.7

NEW JERSEY

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Horizon Blue Cross Blue Shield	50.9
2	Aetna	23.2
3	United Healthcare	8.9
4	CIGNA HealthCare, Inc.	8.0
5	AmeriHealth Insurance Company of New Jersey/AmeriHealth HMO, Inc.	2.4
	Other	6.6

NEW MEXICO		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Presbyterian Health Plan/Presbyterian Insurance Company	34.5
2	Blue Cross and Blue Shield of New Mexico	25.2
3	Lovelace Health Plan	17.3
4	Molina Healthcare, Inc.	8.0
5	CIGNA HealthCare, Inc.	3.5
	Other	11.5

NEW YORK		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	WellPoint, Inc.	19.3
2	United Healthcare	11.2
3	Excellus BlueCross BlueShield	11.2
4	GHI, an EmblemHealth Company	9.4
5	Aetna	6.6
	Other	42.2

NORTH CAROLINA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of North Carolina	43.9
2	Community Care of North Carolina/Carolina Access	20.0
3	North Carolina State Health Plan	11.8
4	CIGNA HealthCare, Inc.	7.7
5	Aetna	5.6
	Other	10.9

NORTH DAKOTA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross Blue Shield of North Dakota	82.4
2	Primary Care Case Management	8.6
3	Aetna	2.4
4	Blue Cross and Blue Shield of Illinois	2.1
5	CIGNA HealthCare, Inc.	1.4
	Other	3.1

OHIO		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Medical Mutual of Ohio	31.0
2	WellPoint, Inc.	19.4
3	Aetna	11.0
4	CareSource	10.7
5	Molina Healthcare, Inc.	3.1
	Other	24.9

OKLAHOMA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	SoonerCare	35.6
2	Blue Cross and Blue Shield of Oklahoma	29.3
3	Aetna	10.3
4	CommunityCare Managed Healthcare Plans of Oklahoma	5.9
5	Oklahoma State and Education Employees Group Insurance Board	5.5
	Other	13.3

OREGON		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Regence BlueCross BlueShield of Oregon	18.6
2	Kaiser Foundation Health Plan of the Northwest, Inc.	17.1
3	Providence Health Plan	12.5
4	ODS Companies, The	9.1
5	PacificSource Health Plans	6.7
	Other	36.0

PENNSYLVANIA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Highmark Blue Cross Blue Shield	30.0
2	Independence Blue Cross	17.6
3	Aetna	9.5
4	Capital Blue Cross	7.8
5	UPMC Health Plan, Inc.	4.7
	Other	30.4

RHODE ISLAND

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross & Blue Shield of Rhode Island	62.5
2	United Healthcare	13.3
3	Neighborhood Health Plan of Rhode Island, Inc.	11.7
4	Tufts Associated Health Plans, Inc.	3.7
5	Aetna	3.5
	Other	5.4

SOUTH CAROLINA

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	BlueCross BlueShield of South Carolina	42.1
2	AmeriHealth Mercy Family of Companies	10.4
3	CIGNA HealthCare, Inc.	9.7
4	South Carolina Solutions	5.9
5	Aetna	5.8
	Other	26.1

SOUTH DAKOTA

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Wellmark Blue Cross and Blue Shield of South Dakota	44.1
2	PRIME	18.7
3	Avera Health Plans	12.0
4	Sanford Health Plan	9.2
5	DAKOTACARE	5.3
	Other	10.7

TENNESSEE

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	BlueCross BlueShield of Tennessee	57.0
2	CIGNA HealthCare, Inc.	13.8
3	United Healthcare	13.2
4	Aetna	4.7
5	AMERIGROUP Community Care	4.5
	Other	6.8

TEXAS

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of Texas	34.7
2	Aetna	22.5
3	CIGNA HealthCare, Inc.	8.8
4	AMERIGROUP Community Care	5.1
5	Centene Corporation	4.0
	Other	24.9

UTAH

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	SelectHealth	36.3
2	Regence BlueCross BlueShield of Utah	21.4
3	Coventry Health and Life Insurance Company	9.1
4	Aetna	6.5
5	Molina Healthcare, Inc.	5.3
	Other	21.4

VERMONT

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Global Commitment to Health	38.1
2	Blue Cross and Blue Shield of Vermont	34.2
3	CIGNA HealthCare, Inc.	22.2
4	Aetna	2.7
5	DAKOTACARE	0.8
	Other	2.1

VIRGINIA

Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	WellPoint, Inc.	35.5
2	Aetna	16.2
3	Sentara Health Plans, Inc.	13.2
4	CIGNA HealthCare, Inc.	10.4
5	Kaiser Foundation Health Plan of the Mid-Atlantic States, Inc.	5.8
	Other	18.9

WASHINGTON		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Premiera Blue Cross	29.8
2	Regence BlueShield	25.1
3	Group Health Cooperative	8.1
4	Molina Healthcare, Inc.	8.1
5	Aetna	7.3
	Other	21.5

WEST VIRGINIA		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Mountain State Blue Cross Blue Shield	33.2
2	Physician Assured Access System	12.5
3	WellPoint, Inc.	10.1
4	Aetna	8.9
5	Health Plan of the Upper Ohio Valley, Inc.	8.3
	Other	27.0

WISCONSIN		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	WellPoint, Inc.	13.4
2	United Healthcare	13.1
3	Dean Health Insurance, Inc.	9.8
4	Arise Health Plan	6.9
5	Security Health Plan of Wisconsin, Inc.	6.9
	Other	50.0

WYOMING		
Rank	Health Plan	Share of Total Managed Care Enrollment in State, %
1	Blue Cross and Blue Shield of Wyoming	46.2
2	CIGNA HealthCare, Inc.	30.0
3	Blue Cross and Blue Shield of Texas	5.7
4	Aetna	4.9
5	WINhealth Partners	4.6
	Other	8.7

Abbreviations Used

AAMI: Association for the Advancement of Medical Instrumentation

AHA: American Heart Association

AHRQ: Agency for Healthcare Research and Quality

AIS: Atlantic Information Services, Inc.

ASH: American Society of Hypertension

BHS: British Hypertension Society

BRFSS: Behavioral Risk Factor Surveillance System

DBP: diastolic blood pressure

EHS: European Hypertension Society

FDA: Food and Drug Administration

FSA: flexible spending account

HTN: hypertension

NHANES: National Health and Nutrition Examination Survey

NQF: National Quality Forum

PCNA: Preventive Cardiovascular Nurses Association

SBP: systolic blood pressure

SMBP: self-measured blood pressure monitoring



Million Hearts™ is a U.S. Department of Health and Human Services initiative that is co-led by the Centers for Disease Control and Prevention and the Centers for Medicare & Medicaid Services, with the goal of preventing one million heart attacks and strokes by 2017.



Self-measured blood pressure monitoring Loaner program agreement

FOR OFFICE STAFF

Lender information

Organization name

Address

Phone number

Equipment information

Device manufacturer and model

Device ID

Supplies (check all that apply):

- | | |
|--|--|
| <input type="checkbox"/> BP cuff (variable size) | <input type="checkbox"/> BP cuff (XL) |
| <input type="checkbox"/> Carrying case | <input type="checkbox"/> Batteries _____ |
| <input type="checkbox"/> Power cord | <input type="checkbox"/> Other _____ |

Patient information

Name

Patient ID

Preferred contact information (phone or email)

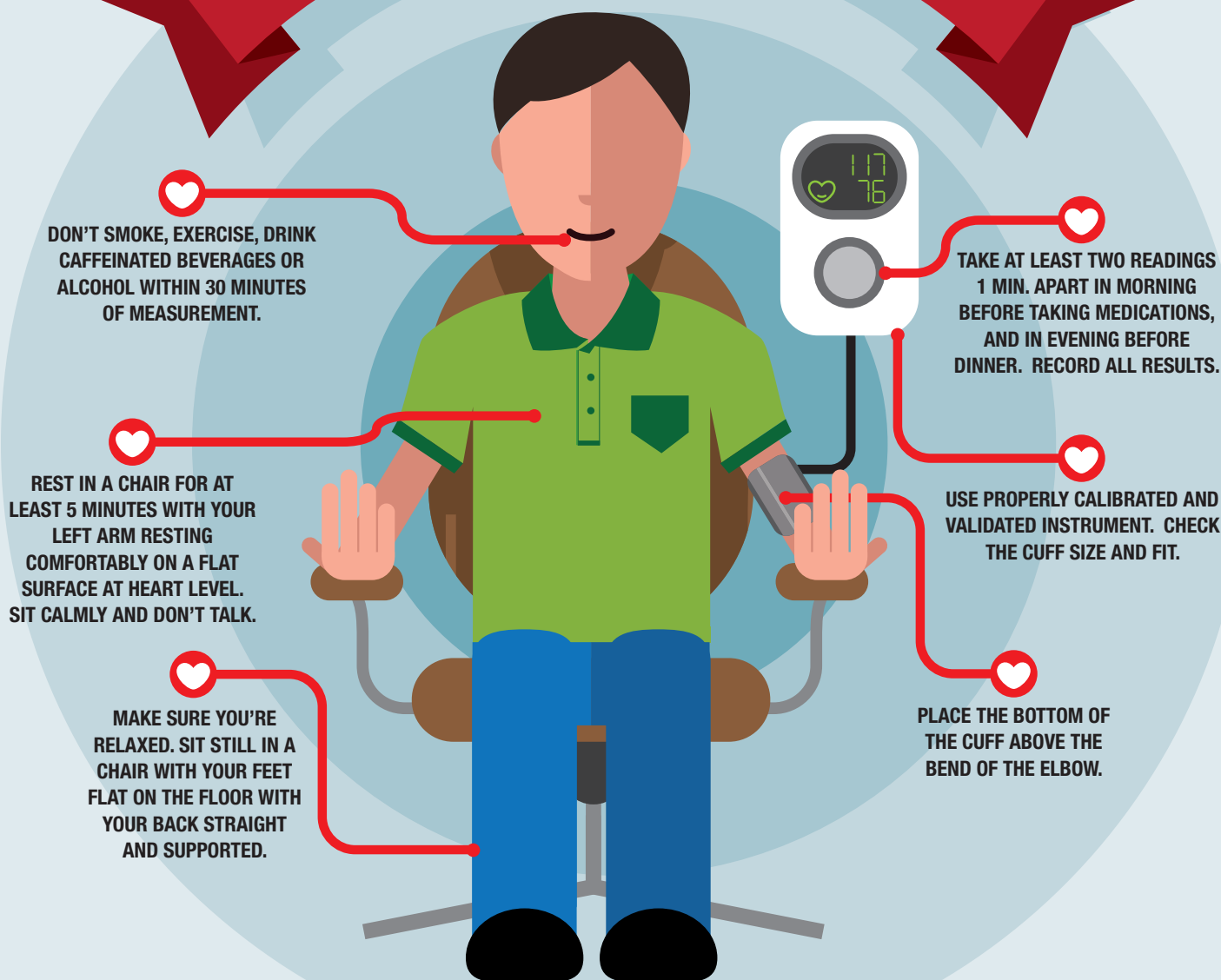
Return by: _____
Month Day Year

- ☐ I agree to participate in the self-measured blood pressure device loaner program and follow the guidelines given to me.
- ☐ I agree to return this device in good working condition on or before its due date.

Patient signature

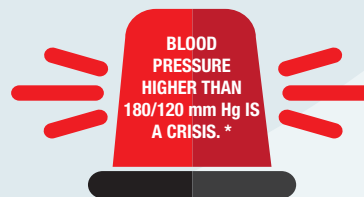
Date

BLOOD PRESSURE MEASUREMENT INSTRUCTIONS



American Heart Association recommended blood pressure levels

BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120-129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130-139	or	80-89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120



* Wait a few minutes and take blood pressure again. If it's still high, contact your doctor immediately.

LEARN MORE AT
[HEART.ORG/HBP](https://heart.org/hbp)

Improve blood pressure control in your practice

MEASURE ACCURATELY AND PROMOTE SELF-MEASURED BLOOD PRESSURE MONITORING AT HOME

As a component of the American Medical Association's **Improving Health Outcomes: Blood Pressure program**, the following guidance is for use by physician office practices and health centers. The goal is threefold: (1) to help increase clinician understanding of the importance and opportunities associated with self-measured blood pressure monitoring (SMBP); (2) to increase patient participation in the management of their own blood pressure (BP), including reporting their BP measurements back to their physician; and (3) to reinforce the need to achieve accurate BP measurements in *all* settings—both at the point of care as well as off site as part of a coordinated SMBP effort.

Supplementary resources entitled “How to check a home blood pressure monitor for accuracy” and “Clinical competency: Self-monitoring blood pressure at home” are available on your local Blue Cross Blue Shield plan's provider website.

Measuring blood pressure accurately—every time and in all settings

The importance of accurate blood pressure measurement cannot be overstated with regard to diagnosing or treating hypertension.

Accurate measurement technique requires training and skill building, but a few common problems related to patient preparation and positioning often account for unreliable readings.^{1,2} The following table shows several common problems that can cause inaccurate blood pressure measurement in any setting:

When the patient has ...	Blood pressure can change by an estimated* ...
Crossed legs	2–8 mm Hg ³
Cuff over clothing	5–50 mm Hg ⁴
Cuff too small	2–10 mm Hg ⁴
Full bladder	10 mm Hg ⁴
Talking or active listening	10 mm Hg ⁴
Unsupported arm	10 mm Hg ^{3,4}
Unsupported back/feet	6.5 mm Hg ⁴

* These values are not cumulative.

Disclaimer

This guidance to the patient should be individualized by the clinician and reinforced by clinical staff at the initiation of any self-measured blood pressure monitoring program. Always make sure patients know what to do should they have a blood pressure measurement that is outside the pre-determined acceptable range or if they experience any symptoms with a high or low blood pressure measurement, including seeking emergency treatment if appropriate.



Implement a standardized process: Ensure blood pressure is measured accurately for each patient

Steps to include are:

- Use a validated, automated device to measure BP.⁵
- Ask the patient “Do you need to use the bathroom?” and allow him/her to do so if needed prior to measurement.³
- Use the correct cuff size for the patient’s arm.³
- Ensure the patient is properly positioned³:
 - Seated in a chair with the back supported
 - Legs uncrossed
 - Feet flat on the ground or supported by a foot stool
 - The blood pressure cuff placed mid-arm, just above the elbow with the arm supported so that the arm and cuff are at the level of the patient’s heart
- Do not allow the patient to talk, use the phone, text or email during the procedure.
- Clinical staff and any family that may be present should also not talk in the room during the procedure.

For additional information about improving blood pressure control in your clinic, please review the AMA’s free CME module “[Improving blood pressure control](#)” on the [AMA Steps Forward website](#). Learn how implementing three simple, evidence-based interventions can help improve blood pressure control for your patients.

What does self-measured blood pressure success look like?

For the practice or health care team looking to refine or add a SMBP component to care delivery, your objectives must include educating patients on how to obtain accurate BP measurements outside of the clinical setting, and empowering patients to report these to the physician or practice in an accurate, timely fashion.

To achieve these goals it is important to establish an office process for engaging patients in self-measurement that includes:

- Training staff to train patients to self-measure blood pressure
- Educating patients on hypertension
- Measuring blood pressure accurately in office and off site
- Mapping out protocols that guide patients to communicate blood pressures back to the care team

Home-based SMBP is useful in hypertension management for several reasons:

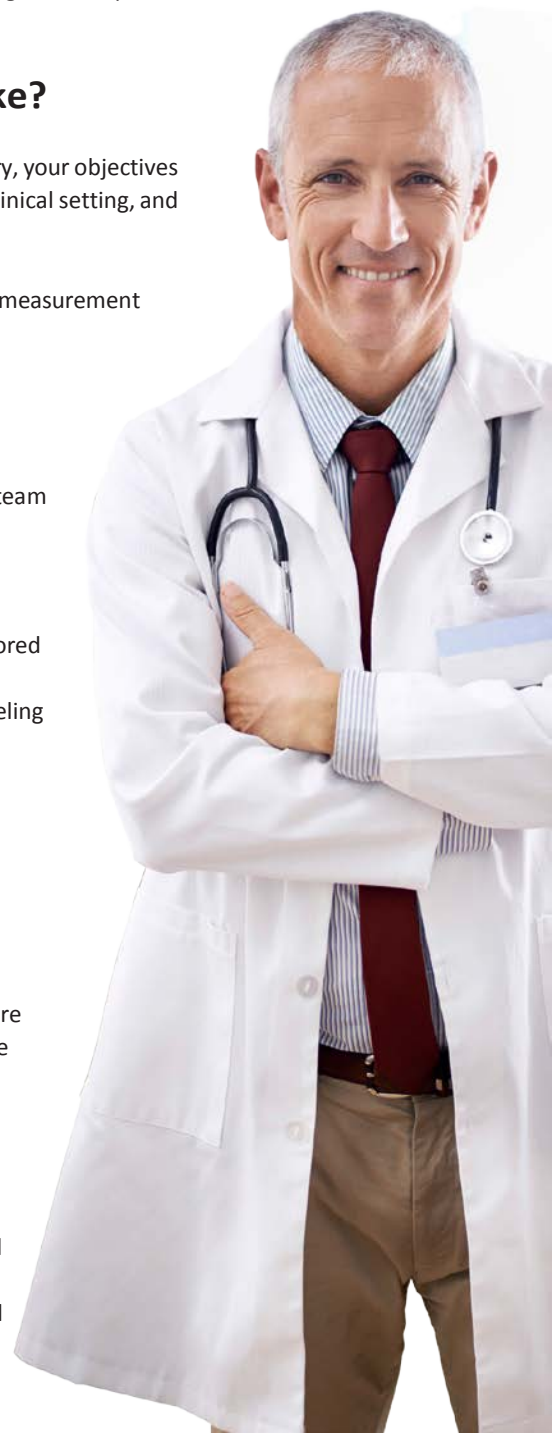
- Improves medication adherence and health outcomes for patients with hypertension^{6,7}
- Improves BP control when a patient-to-clinician feedback loop is established and provides tailored support and advice based on the patient’s data⁶
 - Examples include telemonitoring with counseling, pharmacist counseling, remote counseling from a nurse or lifestyle counseling⁸
- Increases aggressiveness of use of pharmacotherapy⁹ and helps reduce therapeutic inertia
- Offers greater convenience than 24-hour ambulatory BP monitoring¹⁰

Important considerations to keep in mind: Diagnosing hypertension

When patients have elevated blood pressures in the office and the diagnosis of hypertension is suspected, SMBP can be extremely useful in differentiating between “white coat” hypertension and sustained hypertension. White coat hypertension occurs when a patient’s blood pressures are persistently elevated in the office setting and blood pressure measurements taken outside of the office are normal.

Masked hypertension occurs when office blood pressures are normal, but out-of-office blood pressures are elevated.

To increase the chance of diagnosing a patient suspected of having either white coat or masked hypertension, it is best to use multiple out-of-office readings over time. This is due to variability in blood pressure over time. There is one protocol for SMBP at home that is widely accepted and used in many national and international guidelines.¹¹



- Patients should take two blood pressure measurements with a validated automated upper arm device (one minute apart) each morning and each evening with a goal of collecting these measurements for seven days (with a minimum of three days being acceptable)
- Calculate the average of all of the measured systolic and diastolic blood pressures into a single systolic and single diastolic blood pressure
- If the average systolic blood pressure (SBP) ≥ 135 mm Hg or diastolic blood pressure (DBP) > 85 mm Hg, then the patient meets the criteria for hypertension
- If the diagnosis of hypertension, white coat hypertension or masked hypertension remains uncertain, use of 24-hour ambulatory blood pressure monitoring (ABPM) is recommended

Data analysis: Communication of self-measured blood pressures from home back to clinician's office for interpretation found most effective

There are several ways for patients to communicate home blood pressure measurements back to the clinical team:

- Phone measurements to office to an assigned staff member
- Fax measurements via secure number
- Send measurements online through the facility's secure patient portal
- Send the measurements online through a secure telemedicine site
- If blood pressure device has memory capability, the patient can bring the device to the office for staff to review or download
- Patient can return for a scheduled follow-up visit after SMBP is completed

Each clinician's office should analyze the process it uses to have patients communicate SMBP readings. Inform patients how and when you will respond to their communications and what the patient should do in the event of a concerning blood pressure reading, particularly if the office is not able or does not intend to respond immediately.

Documentation: The average SMBP measurement from home should be entered in patient's health record

All of the individual blood pressure measurements performed by the patient should be averaged weekly into a single systolic and diastolic blood pressure that will be used to determine the diagnosis and/or guide treatment.

- Document the average systolic and diastolic BP values in the patient's electronic health record.

References

1. Williams JS, Brown SM, Conlin PR. Blood-Pressure Measurement. *N Engl J Med*. 2009;360(5):e6.
2. Ogedegbe G, Pickering T. Principles and techniques of blood pressure measurement. *Cardiol Clin*. 2010 Nov;28(4):571-86.
3. Pickering. et al. Recommendations for Blood Pressure Measurement in Humans and Experimental Animals Part 1: Blood Pressure Measurement in Humans. *Circulation*. 2005;111: 697-716.
4. Handler J. The importance of accurate blood pressure measurement. *The Permanente Journal*. Summer 2009/Volume 13 No. 3 51.
5. Campbell NR, Berbari AE, Cloutier L, et al. Policy statement of the world hypertension league on noninvasive blood pressure measurement devices and blood pressure measurement in the clinical or community setting. *J Clin Hypertens*. 2014;16(5):320-322.
6. Centers for Disease Control and Prevention Self-Measured Blood Pressure Monitoring: Action Steps for Public Health Practitioners, GA: Centers for Disease Control and Prevention, U.S. Dept. of Health and Human Services; 2013.
7. Bosworth HB, Powers BJ, Olsen MK, et al. Home blood pressure management and improved blood pressure control: Results from a randomized controlled trial. *Arch Intern Med*. 2011;171: 1173-1180.
8. McManus J, Mant J, Bray EP, et al. Telemonitoring and self-management in the control hypertension (TASMINH2): a randomized controlled trial. *Lancet*. 2010; 376:163-172.
9. Omboni S, Gazzola T, Carabelli G, Parati, G. Clinical usefulness and cost effectiveness of home blood pressure telemonitoring: Meta-analysis of randomized controlled studies. *J Hypertension*. 2013;31:455-467.
10. Pickering TG, Miller NH, Ogedegbe G, Krakoff LR, Artinian NT, Goff D. Call to action on use and reimbursement for home blood pressure monitoring: A Joint Scientific Statement from the American Heart Association, American Society of Hypertension, and Preventive Cardiovascular Nurses Association. *Hypertension*. 2008;52:10-29.
11. Niiranen TJ, Johansson JK, Reunanen A, Jula AM. Optimal schedule for home blood pressure measurement based on prognostic data. *Hypertension*. 2011;57:1081-1088.

Suggested citation: Improving Health Outcomes: Blood Pressure. Murakami L and Rakotz M.

Improve blood pressure control in your practice: Measure accurately and promote self-measured monitoring at home. 1st ed. Hertzberg M and Johnson S, eds. American Medical Association; May 2016.



Self-measured blood pressure

Device accuracy test¹

A patient's self-measured blood pressure (SMBP) monitoring device should be tested before it is used as part of an SMBP program. Also test the device annually or any time blood pressure readings are questionable.

Step 1

Complete the table below.

Care team should take five blood pressure readings using a combination of the patient's SMBP device and the office's method of blood pressure measurement.

Measurement	Device	Systolic blood pressure (SBP)
A	Patient's	
B	Patient's	
C	Office's	
D	Patient's	
E	Office's	

SBP Example
133
132
141
134
139

Step 2

Part 1: Average measurements B and D

Part 2: Compare average of B and D to measurement C

Part 3: If the *difference* is ...

- **Less than 5 mm Hg**, this device can be used for SMBP
- **Between 6 and 10 mm Hg**, proceed to Step 3
- **Greater than 10 mm Hg**, *replace* the device before proceeding with your SMBP program

Example

Part 1: $(132 + 134) / 2 = 133$

Part 2: $133 - 141 = 8$ (note: if the difference is a negative number, ignore the negative sign)

Part 3: Difference is 8, which is between 6 and 10 mm Hg, so proceed to Step 3

Step 3

Part 1: Average measurements C and E

Part 2: Compare average of C and E to measurement D

Part 3: If the *difference* is ...

- **Less than or equal to 10 mm Hg**, this device can be used for SMBP
- **Greater than 10 mm Hg**, *replace* the device before proceeding with your SMBP program

Example

Part 1: $(141 + 139) / 2 = 140$

Part 2: $140 - 134 = 6$ (note: if the difference is a negative number, ignore the negative sign)

Part 3: Difference is 6, which is less than or equal to 10 mm Hg, so proceed with SMBP program



Be one in a MILLION HEARTS™

Preventing 1 million heart attacks and strokes over 5 years



The Problem

Americans suffer almost 2 million heart attacks and strokes each year. Heart disease and stroke (sometimes called a brain attack) are the first and fourth leading causes of death in the United States. They cause about 30% of all deaths. But there's good news! The major risk factors for heart disease and stroke—high blood pressure, cholesterol, smoking, and obesity—*can* be prevented and controlled.

Our Goals

Help Americans make healthy choices, such as quitting smoking and lowering the amount of sodium (salt) and trans fat we eat. Healthy choices from the start mean that fewer people will need to take medicines to control their blood pressure or cholesterol. When it comes to heart health, it is never too late to lower risk! We control our choices.

Community Health Workers and Million Hearts™

Million Hearts™ is a national program to prevent 1 million heart attacks and strokes in the United States by 2017. The Centers for Disease Control and Prevention (CDC) and the Centers for Medicare and Medicaid Services (CMS) are the lead federal agencies for this initiative.

Community health workers (CHWs)/promotores de salud, community health representatives, and others can work together with CDC and CMS to help reach the program's goal. For those at risk for high blood pressure and high cholesterol, CHWs can play an important role in prevention.

To support people in their health care needs, CHWs can—

TEACH community members that they need to get screened for high blood pressure and cholesterol. Most of the time, people at risk do not feel sick and are not aware they have these conditions.

TEACH community members to ask for and know their blood pressure and cholesterol numbers and to know what healthy levels should be.

ENCOURAGE community members to ask their doctor what their goals should be for blood pressure and cholesterol.

TEACH community members how important it is for them to control their blood pressure and cholesterol.

TEACH community members that uncontrolled high blood pressure and cholesterol can damage their eyes, kidneys, heart, blood vessels, and brain. High blood pressure can also lead to chronic kidney failure requiring dialysis.

TEACH community members that high blood pressure and cholesterol will put them at high risk for heart attack, heart failure, and stroke.

HELP community members who have diabetes understand the importance of controlling the disease and regularly taking their diabetes medications.

INTRODUCE community members to social workers and others who can help them apply for programs and insurance that can help pay for health care.

To help promote better lifestyle choices, CHWs can—

HELP community members learn how to reduce their daily intake of sodium (salt).

WORK with community members to find easier, less expensive ways to increase the intake of fruits, vegetables, and lower sodium and whole grain foods in the community, at schools, and at work.

HELP people stay active and fit and maintain a healthy weight.

HELP people choose a diet low in saturated fat and trans fat.

HELP people learn to bake, broil, or roast food instead of frying.

ENCOURAGE those who drink alcohol to consume no more than one drink a day for women and no more than two for men. One drink is 1 oz. of hard liquor, 4 oz. of wine, or 12 oz. of beer.

ENCOURAGE people to quit smoking and not use tobacco to reduce risks for diseases and improve health in general.

LEARN how to help community members apply for programs and insurance that can help pay for health care and other needs.

Remember Your ABCS! What Does That Mean?

A is for aspirin. Sometimes people who have heart problems or who have had a stroke need to take aspirin to help their heart. CHWs can remind people to take aspirin as advised by their doctor.

B is for blood pressure control. CHWs can encourage people to take their blood pressure medicines regularly and have their blood pressure checked to make sure that it is within the normal range. This step also tells people whether their blood pressure medicine is working.

C is for cholesterol management. CHWs can teach people why it is important to have their cholesterol checked.

S is for smoking cessation. CHWs can teach community members about the harmful effects that smoking has on the person smoking and on others around them. CHWs can also teach people about how smoking puts people at risk for heart attack, heart disease, and stroke. CHWs can teach people about other ways to manage stress and depression.

Visit **millionhearts.hhs.gov** for more information about Million Hearts™.

Remember, CHWs are part of the solution.



Stay connected



facebook.com/MillionHearts



twitter.com/@MillionHeartsUS

Resource: CHW Sourcebook

www.cdc.gov/dhdsp/programs/nhdsp_program/chw_sourcebook/pdfs/sourcebook.pdf

Supporting Your Patients with High Blood Pressure Visit Checklist



Questions to Ask

Consider asking these questions to get a discussion going:

- ▶ What have you been doing since our last visit to control your blood pressure?
- ▶ What concerns you the most about your high blood pressure?
- ▶ What specifically would you like to work on to manage your high blood pressure?
- ▶ How confident are you that you could do [behavior] to help control your blood pressure?
- ▶ What might get in the way or keep you from being successful?
- ▶ What do you think would make it easier to control your high blood pressure?

Million Hearts® is a national initiative to prevent 1 million heart attacks and strokes by 2017. It is led by the Centers for Disease Control and Prevention and the Centers for Medicare & Medicaid Services, two agencies of the Department of Health and Human Services.

The Million Hearts® word and logo marks and associated trade dress are owned by the U.S. Department of Health and Human Services (HHS). Use of these marks does not imply endorsement by HHS.

Effective provider-patient communication improves health and saves time. Use this checklist as a guide during visits with patients working to control high blood pressure.

- ☐ Explain the roles of each member of the health care team.
- ☐ Ask, “What is most important for you to accomplish during your visit today?” The answer helps set the agenda.
- ☐ Review blood pressure goal against current reading(s).
- ☐ Have an open conversation about goals, achievements, confidence, and barriers. See sidebar for some examples.
- ☐ Help set small, achievable goals based on patients’ answers. For example, if the patient is working to improve diet, establish a goal to swap out favorite food items for lower sodium versions. Small changes can gradually lead to more heart-healthy meals, cooked at home.
- ☐ Use the “Ask-Tell-Ask” technique to address actions for each behavioral goal:
 - **Ask** permission to provide information on a specific topic. For example, for medication adherence, you might say, “There are several things I want to tell you about your new medication. Is that okay?”
 - **Tell** the patient what they need to know (e.g., when they should take the medication, expected side effects, importance of taking it as directed). Use simple words and diagrams or pictures.
 - **Ask** the patient to repeat back the information in their own words.
- ☐ Provide the patient with the following tools:
 - **Blood pressure tracker** with target numbers written prominently
 - Home blood pressure monitoring instructions—**review this helpful guide**
 - Healthy diet information
 - Community options for exercising
 - Support groups to join
- ☐ Remind the patient to record blood pressure readings between office visits and share with the team by phone, fax, or e-mail as well as at the next office visit.

Tools and Resources

- ▶ **American Medical Group Foundation’s Provider Toolkit to Improve Hypertension Control** includes printable assessments for patients around goal-setting and assessing self-management knowledge (see pages 49 and 51).
- ▶ **Hypertension Control Change Package for Clinicians** includes change concepts, change ideas, and resources to help health care practices efficiently and effectively care for patients with hypertension.
- ▶ Visit the **Million Hearts®** website for more information and resources for helping patients control hypertension.

Improving Medication Adherence Among Patients with Hypertension

A Tip Sheet for Health Care Professionals



Medication adherence is critical to successful hypertension control for many patients. However, only 51% of Americans treated for hypertension follow their health care professional's advice when it comes to their long-term medication therapy.¹

Adherence matters. High adherence to antihypertensive medication is associated with higher odds of blood pressure control, but non-adherence to cardioprotective medications increases a patient's risk of death from 50% to 80%.¹

As a health care professional, you can empower patients to take their medications as prescribed. Effective two-way communication is critical; in fact, it doubles the odds of your patients taking their medications properly. Try to understand your patients' barriers and address them honestly to build trust.

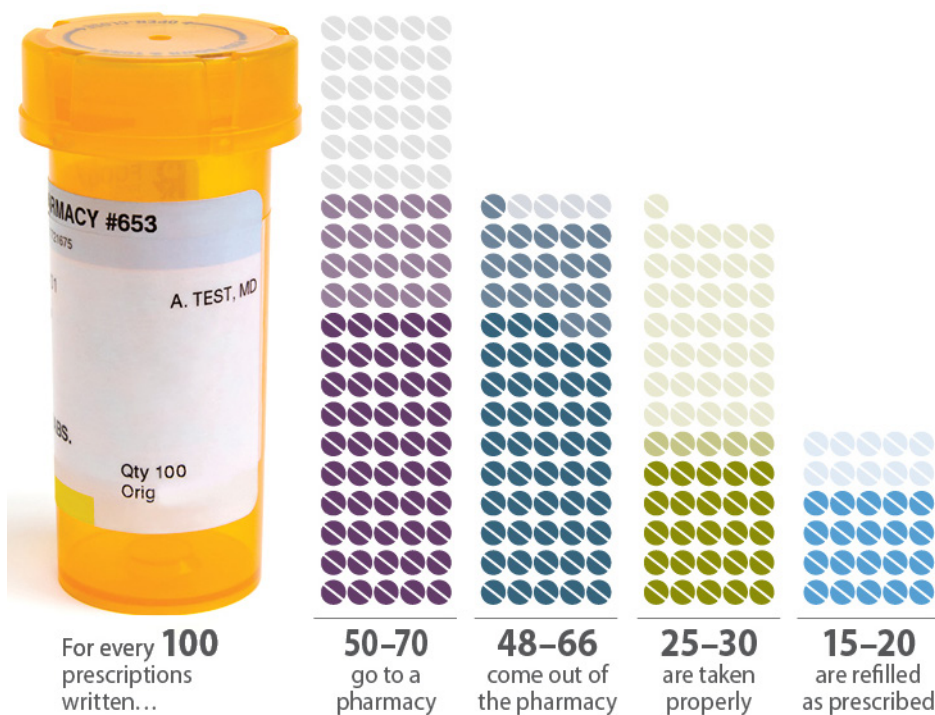
Predictors of Non-Adherence

When discussing medications, be aware if your patient:

- ▶ Demonstrates limited English language proficiency or low literacy.
- ▶ Has a history of mental health issues like depression, anxiety, or addiction.
- ▶ Doesn't believe in the benefits of treatment.
- ▶ Believes medications are unnecessary or harmful.
- ▶ Has a concern about medication side effects.
- ▶ Expresses concern over the cost of medications.
- ▶ Says he or she is tired of taking medications.

These can all be predictors of a patient who may struggle with adherence to medication.

Medication Adherence by the Numbers*



*This data applies to all medication types, not only hypertension medication.

¹ Ho PM, Bryson CL, Rumsfeld JS. Medication adherence: its importance in cardiovascular outcomes. *Circulation*. 2009;119:3028-3035.



As a health care professional, you can empower patients to take their medications as prescribed. Effective two-way communication is critical; in fact, it doubles the odds of your patients taking their medications properly.

Use the SIMPLE method to help improve medication adherence among your patients

Simplify the regimen

- ▶ Encourage patients to use adherence tools, like day-of-the-week pill boxes or mobile apps.
- ▶ Work to match the action of taking medication with a patient's daily routine (e.g., meal time or bed time, with other medications they already take properly).

Impart knowledge

- ▶ Write down prescription instructions clearly, and reinforce them verbally.
- ▶ Provide websites for additional reading and information—find suggestions at the **Million Hearts®** website.

Modify patients' beliefs and behavior

- ▶ Provide positive reinforcement when patients take their medication successfully, and offer incentives if possible.
- ▶ Talk to patients to understand and address their concerns or fears.

Provide communication and trust

- ▶ Allow patients to speak freely. Time is of the essence, but research shows that most patients will talk no longer than 2 minutes when given the opportunity.
- ▶ Use plain language when speaking with patients. Say, "Did you take all of your pills?" instead of using the word "adherence."
- ▶ Ask for patients' input when discussing recommendations and making decisions.
- ▶ Remind patients to contact your office with any questions.

Leave the bias

- ▶ Understand the predictors of non-adherence and address them as needed with patients.
- ▶ Ask patients specific questions about attitudes, beliefs, and cultural norms related to taking medications.

Evaluate adherence

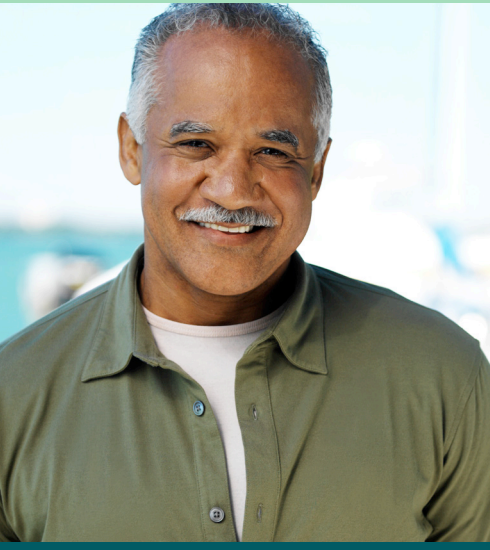
- ▶ Ask patients simply and directly whether they are sticking to their drug regimen.
- ▶ Use a medication adherence scale—most are available online:
 - ▷ Morisky-8 (MMAS-8)
 - ▷ Morisky-4 (MMAS-4 or Medication Adherence Questionnaire)
 - ▷ Medication Possession Ratio (MPR)
 - ▷ Proportion of Days Covered (PDC)

Source: <http://www.acpm.org/?MedAdhereTTProviders>

Find and download additional materials to help your patients control hypertension at the **Million Hearts®** website.

High Blood Pressure

How to Make Control Your Goal



Did you know?

Of the 67 million American adults who have high blood pressure, 16 million know they have the condition and are receiving treatment, but their blood pressure still remains too high.

African Americans are more likely to have high blood pressure (also called hypertension), which puts them at greater risk of dying from cardiovascular disease. About 2 out of every 5 African American adults have high blood pressure, and less than half of them have it under control.

It's up to you to successfully manage and control your blood pressure. But it doesn't have to be a daunting task. You can take small, manageable steps to make blood pressure control **your** goal. Here are some tips to show you how.

Engage your health care team

Blood pressure control is a team effort. Engage all of your health care professionals—not just your primary care physician or cardiologist. Your pharmacist, nurses, and other health care specialists can help you control your high blood pressure.

Next time you go in for a visit, make a list of questions you want to ask your health care professional. For example:

- ▶ What is my blood pressure goal?
- ▶ What are the best ways to reach my goal?
 - ▷ Mention what you're already doing to work toward control, including exercising, changing your diet, or taking medications as prescribed.
 - ▷ Be honest and realistic with yourself and your health care team about what lifestyle changes you're ready to make and the ones you're not quite ready for.
 - ▷ Pick one goal to start working toward. As you achieve success and build confidence, choose another goal to tackle.

Take your medications faithfully

Your health care team has put together a specific medication schedule to help control your blood pressure. You might forget to take your medicine every day, or maybe you're having trouble dealing with the side effects. Remember that your medication is important to control and maintain your blood pressure.

Here are some tips to help you stick with your medication plan:

- ▶ Talk to your doctor about any side effects you experience with your medications. If necessary, discuss other treatment options. **Never stop treatment on your own.**
- ▶ Make a schedule and set up a system to remind you to take your medications regularly—use a pillbox for every pill, every day, or use smartphone “app” reminders.
 - ▷ If your insurance provides mail order delivery, set it up and request a 90-day supply of medications.
 - ▷ If this service is not available, schedule all your refills at the same pharmacy at the same time each month so you can pick them up all at once.



Thelma's Story

Thelma was 30 years old when she was diagnosed with high blood pressure by chance through a free health fair screening for diabetes. Her screening raised concerns, and the screener connected her to a doctor who diagnosed her with both diabetes and high blood pressure. Although heart disease runs in her family, Thelma blamed herself for her high blood pressure. She knew she wasn't eating right or exercising and was letting the stress of marriage and children get to her. She knew she needed to get her blood pressure under control and committed to making lifestyle changes.

Now, Thelma stays active by walking, working out at the gym, and playing with her 1-year-old granddaughter. Every day, she and her husband work toward maintaining a healthy diet, aiming to limit how much sugar and salt they eat. Thelma takes her medications as prescribed and follows her doctor's treatment plan. With the support of her family and her doctor, Thelma made control her goal and is enjoying a healthier life.

Monitor your blood pressure

What's your blood pressure goal? Develop a plan to regularly check your blood pressure, not just at the doctor's office, but at home or at a pharmacy. Track your results in a log or diary to monitor your progress.

Make healthy choices

- ▶ Exercise can be a great way to help control your blood pressure. Find a safe place to walk or be more active. Increase the time and intensity of your physical activity as you progress.
- ▶ Shop for more fresh fruit, vegetables, and whole grains and fewer prepared foods with high sodium, cholesterol, saturated fat, and trans fat.
- ▶ Learn to read labels and choose foods lower in sodium. Lowering your sodium will lower your blood pressure.
- ▶ Quit smoking. About 1 in 5 African American adults smokes cigarettes. There are many tools available to help you. Call 1-800-QUIT-NOW or visit **Smokefree.gov** for help.

Tools and resources

Million Hearts®, in partnership with the American Heart Association/American Stroke Association, has developed online tools to help you track and manage your heart health, including your blood pressure, and provide helpful advice and information. Check out:

- ▶ **Heart360®**
- ▶ **My Life Check®**

Find and download additional materials to help control your high blood pressure at the **Million Hearts®** website.

Million Hearts® is a national initiative to prevent 1 million heart attacks and strokes by 2017. It is led by the Centers for Disease Control and Prevention and the Centers for Medicare & Medicaid Services, two agencies of the Department of Health and Human Services.

The Million Hearts® word and logo marks and associated trade dress are owned by the U.S. Department of Health and Human Services (HHS). Use of these marks does not imply endorsement by HHS.

millionhearts.hhs.gov

High Blood Pressure

How to Make Control Your Goal



Did you know?

Of the 75 million American adults who have high blood pressure, only about half (54%) of these people have their blood pressure under control.

It's up to you to successfully manage and control your blood pressure. But it doesn't have to be a daunting task. You can take small, manageable steps to make blood pressure control **your** goal. Here are some tips to show you how.

Engage your health care team

Blood pressure control is a team effort. Engage all of your health care professionals—not just your primary care physician or cardiologist. Your pharmacist, nurses, and other health care specialists can help you control your high blood pressure.

Next time you go in for a visit, make a list of questions you want to ask your health care professional. For example:

- ▶ What is my blood pressure goal?
- ▶ What are the best ways to reach my goal?
 - ▷ Mention what you're already doing to work toward control, including exercising, changing your diet, or taking medications as prescribed.
 - ▷ Be honest and realistic with yourself and your health care team about what lifestyle changes you're ready to make and the ones you're not quite ready for.
 - ▷ Pick one goal to start working toward. As you achieve success and build confidence, choose another goal to tackle.

Take your medications faithfully

Your health care team has put together a specific medication schedule to help control your blood pressure. You might forget to take your medicine every day, or maybe you're having trouble dealing with the side effects. Remember that your medication is important to control and maintain your blood pressure.

Here are some tips to help you stick with your medication plan:

- ▶ Talk to your doctor about any side effects you experience with your medications. If necessary, discuss other treatment options. **Never stop treatment on your own.**
- ▶ Make a schedule and set up a system to remind you to take your medications regularly—use a pillbox for every pill, every day, or use smartphone “app” reminders.
 - ▷ If your insurance provides mail order delivery, set it up and request a 90-day supply of medications.
 - ▷ If this service is not available, schedule all your refills at the same pharmacy at the same time each month so you can pick them up all at once.



Don's Story

As an avid runner, Don thought he was in great shape. When he was diagnosed with high blood pressure during a routine physical exam more than 30 years ago, Don was frustrated. High blood pressure is a common condition among men in his family. Don's grandfather, father, and two younger brothers all had high blood pressure. Because he knew he couldn't control his family history, Don focused on what he could control.

Don committed to understanding his condition and working with his health care team to improve diet, exercise more, and manage stress. Because of his busy work schedule as a veterinarian and his limited cooking skills, Don's wife supports his efforts by preparing healthy, low sodium meals. No longer able to run marathons, Don walks several times a day with his 15-year-old dog, Sophie. To help relax, Don meditates every day. He also volunteers at a local hospice and shares his love for animals by instructing and evaluating animal-assisted therapy volunteers and working with two animal outreach groups.

Don knows that he plays the most important role in controlling his high blood pressure; that's why he's made control his goal. He works closely with his health care team and has a strong support system in his family and colleagues.

Monitor your blood pressure

What's your blood pressure goal? Develop a plan to regularly check your blood pressure, not just at the doctor's office but at home or at a pharmacy. Track your results in a log or diary to monitor your progress.

Make healthy choices

- ▶ Exercise can be a great way to help control your blood pressure. Find a safe place to walk or be more active. Increase the time and intensity of your physical activity as you progress.
- ▶ Shop for more fresh fruit, vegetables, and whole grains and fewer prepared foods with high sodium, cholesterol, saturated fat, and trans fat.
- ▶ Learn to read labels and choose foods lower in sodium. Lowering your sodium intake can help lower your blood pressure.
- ▶ Quit smoking. There are many tools available to help you. Call 1-800-QUIT-NOW or visit **Smokefree.gov** for help.

Tools and resources

Million Hearts®, in partnership with the American Heart Association/American Stroke Association, has developed online tools to help you track and manage your heart health, including your blood pressure, and provide helpful advice and information. Check out:

- ▶ **Heart360®**
- ▶ **My Life Check®**

Find and download additional materials to help control your high blood pressure at the **Million Hearts®** website:

- ▶ **Heart Age Calculator**
- ▶ **Blood Pressure Wallet Card**

Million Hearts® is a national initiative to prevent 1 million heart attacks and strokes by 2017. It is led by the Centers for Disease Control and Prevention and the Centers for Medicare & Medicaid Services, two agencies of the Department of Health and Human Services.

The Million Hearts® word and logo marks and associated trade dress are owned by the U.S. Department of Health and Human Services (HHS). Use of these marks does not imply endorsement by HHS.

millionhearts.hhs.gov

Detection and Management High Blood Pressure



Common Errors of BP Measurement

Error	Effect Systolic/Diastolic	What to do to correct error
Sitting with back unsupported	+6-10/ unknown	Support back (Sit in chair . Do not take on exam table)
Full bladder	+ \geq 10-15 / +10	Empty bladder before measurement
Tobacco/caffeine use and Exercise	+6-20 / unknown	Advise patient to avoid for 30 minutes before measurement
"White Coat" effect	+11-30	Have someone else take measurement Use home measurements
Talking, hand gestures or active listening	+7-10 / +10	No talking during measurement
Cuff to long or wide	False low	Choose correct size cuff—Bladder length at least 80% and width at least 40% of arm circumference. When in doubt use larger cuff.
Cuff to short or narrow	+ \geq 10 / +2-8	
Cuff not centered over brachial artery	+4	Center bladder over brachial artery
Cuff applied over clothing	+5-50/ unknown	Apply cuff to a bare arm
Arm not at heart level . BP taken .. Above heart level Below heart level Parallel to body	False low False high +9-13/unknown	Adjust table or chair so arm rests on firm surface at heart level For every 1" above or below heart level, the reading may be off by 2mm Hg
Arm not supported on firm surface	+1-10 / +5-11	Rest arm on firm surface. Do not hold patient's arm
Not resting 5 minutes before taking the measurement	+	Take measurement after 5 minute rest or at end of visit
Feet not flat on floor or legs crossed	+ 2-8/	Have patient sit with feet flat on the floor
Deflation rate faster than 2-3 mm Hg	Underestimates/ overestimates	Train examiners to deflate cuff at a rate of 2-3 mm Hg
Not determining the maximum inflation level	Underestimate systolic or miss auscultatory gap	Train examiners to estimate systolic, then add 20-30 mm Hg to the pulse obliteration point
Heavy pressure on the stethoscope	Pulse may be heard below systolic or to zero	Use light pressure to hold stethoscope in place
Failure to detect auscultatory gap	Record a falsely lower systolic	Train examiners to estimate systolic & determine the maximum inflation level

EXAMPLE OF SELF-MEASURED BLOOD PRESSURE MONITORING WORKFLOW

Introduction

Self-measured blood pressure (SMBP) monitoring with additional clinical supports is a proven approach to reducing the risk of disability or death due to hypertension. Additional clinical support includes:

One-on-One counseling, telephonic or web-based support and educational classes such as:

- Education delivered by trained health care providers and health educators
- Regular communication of home blood pressure (BP) readings and establish a feedback loop
- Provide timely treatment advice/adjustments between patients and clinicians
- Implement clinical supports such as: Telephone based counseling, automated reminders and educational programs

An example of a Self-Measured Blood Pressure (SMBP) monitoring protocol

Patients will be referred to SMBP monitoring program to confirm initial diagnosis, to follow up after a medication adjustment or to monitor hypertensive patients not at goal. Instruct patients to measure for 3-7 days according to clinician advised schedule.

Clinic staff will:

- Assist patients obtain SMBP equipment
- Check the equipment for accuracy
- Teach patients proper SMBP technique
- Show patients how to document and report SMBP readings back to the clinical team
- Provide the patient with instructions on what to do if readings show an abnormal BP measurement

Before following up with the patient:

- Determine patient's individual home BP goal
- Review BP measurements entered into patient portal and determine mean BP from twice daily readings done over a 3-7 day time period
- Review patient's current anti-hypertensive medication regimen
- Assess medication adherence if refill record is available

When following up with the patient:

- Confirm recent adherence to anti-hypertensive medications
- Confirm appropriate preparation and technique for BP measurements
- Confirm patient is following proper SMBP measurement technique

If BP is above goal:

- If patient confirms non-adherence to medications, report to clinician
- Verify patient understands proper SMBP technique and schedule for measurements
- Repeat SMBP when advised by clinician

Source: Adapted from Dr. Barry Stults, University of Utah;
Home Blood Pressure Monitoring (HMBP) Workflow

ADD LOGO

DATE

Dear _____ :

CONGRATULATIONS on your decision to participate in the **Self-Measured Blood Pressure Program**. This is an important step to managing your health.

This program is sponsored through _____

As part of the program you will be instructed in the program and provided with hands on training on how to use the blood pressure device.

If you have questions please contact:

Thank you for taking this next step by increasing your knowledge about your blood pressure.

Sincerely,

Office contact information



Self-Measured Blood Pressure Loaner Program Tracking Sheet

[illegible]

ADD LOGO

Patient participation in Self-Measured Blood Pressure Program Loaner Agreement

I understand by participating in the Self-Measured Blood Pressure program, I will be asked to

- Take my blood pressure using the blood pressure device provided to me and as directed.
- Record the blood pressure readings as instructed below.
- Report these readings to primary care provider

Blood pressure device serial number: _____

Anticipated date of return: _____

Blood pressures will be reported back to the primary care provider by (circle one):

1. Telephone
2. Secure computer messaging/patient portal
3. Bring device or log to office
4. Mailed, if mailing, address:

Patient name (print): _____

Patient date of birth: _____ Insurance ID _____

Email: _____

Phone Number:(_____) _____ Primary Care Provider: _____

By signing this, I agree to the following:

- I agree to participate to the best of my ability by tracking my blood pressure ____ times a week at _____(specify times of day) for ____ weeks/months and submit my results to my primary care provider.
- I will report any blood pressure readings higher than _____ to my primary care provider.
- I will return the blood pressure device to the provider practice on the anticipated return date as listed on this form.
- I understand I may be held financially responsible for any damaged or missing equipment.

Please sign below:

Signed: _____ **Date:** _____

Detection and Management High Blood Pressure



Checking SMBP Equipment Accuracy

Step 1: Help patients select accurate equipment

- Recommend purchasing equipment that has been approved under a formal validation protocol

Note: Not all equipment provides accurate readings in all people. Measurements may be consistently +5mm Hg, so it's important to encourage patients to bring their equipment in to the office to measure its accuracy.

Step 2: Prepare patient for BP measurement

- Sit in chair with back supported
- Legs uncrossed - feet flat on floor
- Arm on firm surface at heart level
- Rest 5 minutes (minimum)
- No tobacco, exercise, caffeine 30 minutes prior to measurement
- Have patient use the bathroom

Note: Measurements taken on an exam table do not meet this requirement.

Step 3: Size and place the cuff

- Verify patient's cuff size
- Inform patient if cuff size is wrong
- Align center of the bladder with brachial artery

Note: Avoid any conversation during the measurement to prevent an increase in blood pressure.

Step 4: Take 5 measurements as follows (no more than 30 seconds apart)

- 1st + 2nd reading taken by patient using own SMBP equipment
- 3rd reading taken by clinic staff with mercury or comparable device
- 4th reading taken by the patient
- 5th reading taken by health care clinician

Step 5: Compare the readings

- Readings usually decline over the 5 measurements; the final systolic may be 10 mm Hg lower than the first
- If the difference is 5 mm Hg or less, the comparison is acceptable
- Repeat if difference is between 5-10 mm Hg
- If difference is more than 10 mm Hg, device may not be accurate.
- Repeat this procedure annually

Detection and Management High Blood Pressure



Cuff Size Chart

A CUFF FOR EVERY SIZE

CUFF NAME	Range of Upper arm CIRCUMFERENCE: (In inches)	Range of Upper arm CIRCUMFERENCE: (In centimeters)
NEWBORN	2 1/4 X 4	6cm TO 10cm
INFANT	4 X 6	10cm to 15cm
CHILD	6 X 8 3/4	15cm to 22cm
SMALL ADULT	8 3/4 X 10 1/4	22cm to 26cm
ADULT	10 1/2 X 13 1/2	27cm to 34cm
LARGE ADULT	13 3/4 X 17 1/4	35cm to 44cm
THIGH	17 3/4 X 20.5	45cm to 52cm

The “ideal” cuff bladder length is 80%-100% (As close 100% as possible)

The “ideal” width is at least 40% (Can be slightly more than 40%)

Circumference means the measurement around the upper arm (Ideal = Length to - width ratio of 2:1)

7 Day Recording Sheet Self-Measured Blood Pressure Monitoring

Name

Date

Day 1

MORNING AVERAGE ☀

SYS	DIA
PULSE	

NOTES

EVENING AVERAGE 🌙

SYS	DIA
PULSE	

NOTES

Day 2

MORNING AVERAGE ☀

SYS	DIA
PULSE	

NOTES

EVENING AVERAGE 🌙

SYS	DIA
PULSE	

NOTES

Day 3

MORNING AVERAGE ☀

SYS	DIA
PULSE	

NOTES

EVENING AVERAGE 🌙

SYS	DIA
PULSE	

NOTES

Day 4

MORNING AVERAGE ☀

SYS	DIA
PULSE	

NOTES

EVENING AVERAGE 🌙

SYS	DIA
PULSE	

NOTES

Day 5

MORNING AVERAGE ☀

SYS	DIA
PULSE	

NOTES

EVENING AVERAGE 🌙

SYS	DIA
PULSE	

NOTES

Day 6

MORNING AVERAGE ☀

SYS	DIA
PULSE	

NOTES

EVENING AVERAGE 🌙

SYS	DIA
PULSE	

NOTES

Day 7

MORNING AVERAGE ☀

SYS	DIA
PULSE	

NOTES

EVENING AVERAGE 🌙

SYS	DIA
PULSE	

NOTES

PRACTICE ADDRESS

PHONE

EMAIL

PATIENT PORTAL

NEXT APPOINTMENT DATE & TIME

Diagnostic SMBP, measure for 7 consecutive days

Confirmed hypertension, measure for 7 consecutive days prior to next office visit

Report Back Results By

- Phone
- Patient portal
- Bring back device or written log
- Other

If your blood pressure measurement is:

MORE THAN

SYS	DIA
-----	-----

Your blood pressure is high. Recheck in 5 minutes. If it remains in this range, call your physician immediately.

BETWEEN

SYS	DIA	&	SYS	DIA
-----	-----	---	-----	-----

This is the desired range for your blood pressure. Please continue to monitor your blood pressure as you have been instructed by your care team.

LESS THAN

SYS	DIA
-----	-----

Your blood pressure is low. Recheck in 5 minutes. If it remains in this range, call your physician immediately.

INSTRUCTIONS: If at any time you feel light headed or have a headache, check your blood pressure and call the office immediately.

INVENTORY MANAGEMENT: BLOOD PRESSURE DEVICE TRACKING

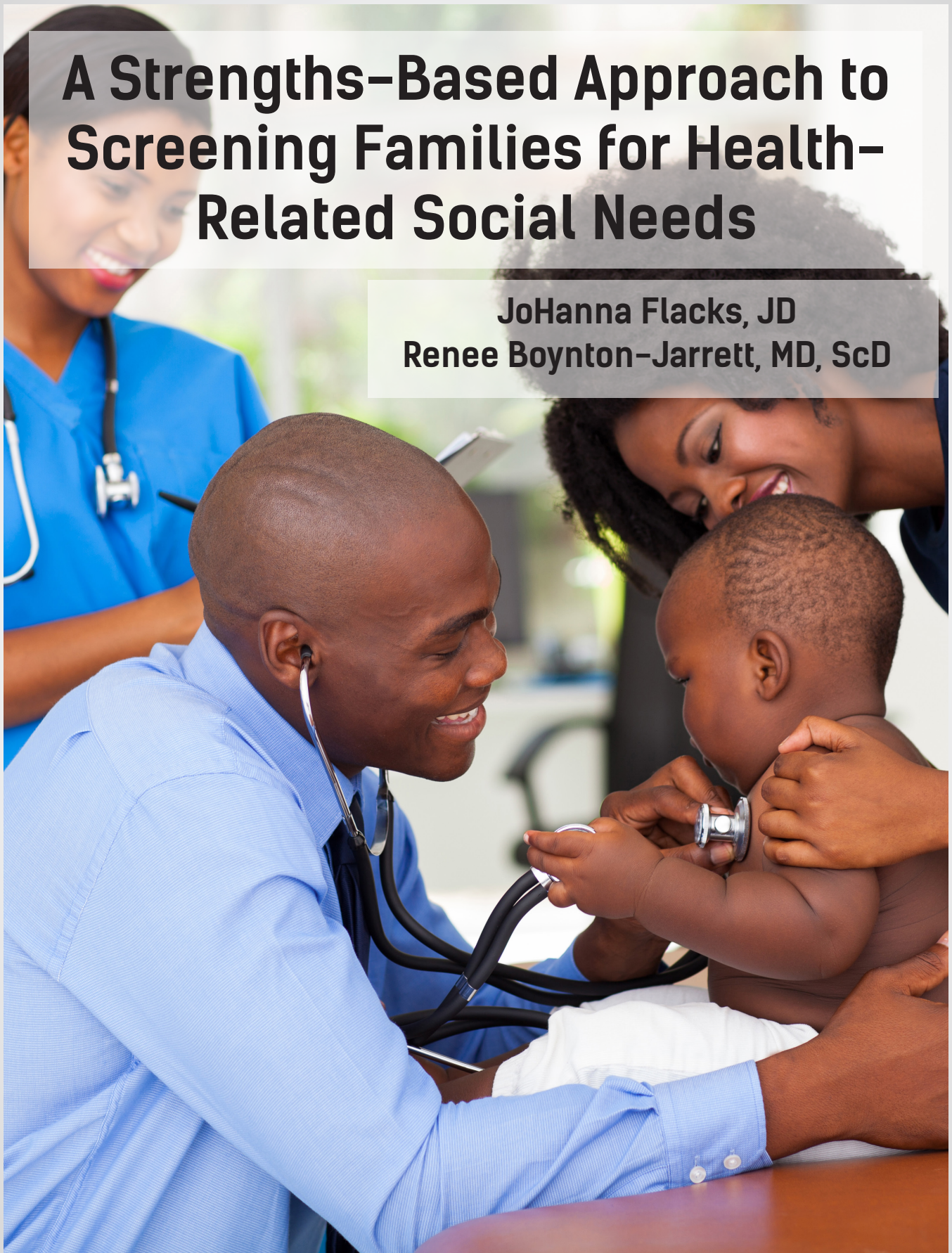
[illegible]

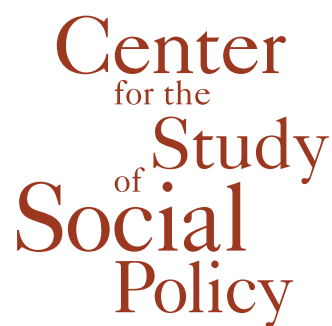
###									
###									
###									
###									
###									
###									
###									
###									
###									
###									

Provided by American Medical Association and the American Heart Association through the TargetBP program.

A Strengths-Based Approach to Screening Families for Health-Related Social Needs

**JoHanna Flacks, JD
Renee Boynton-Jarrett, MD, ScD**





A Strengths-Based Approach to Screening Families for Health-Related Social Needs

© 2018

MLPB equips the healthcare and human services workforce with upstream problem-solving strategies that address health-related social needs. Leveraging its public interest law expertise, MLPB advances health equity for individuals, families, and communities.

The Center for the Study of Social Policy (CSSP) works to secure equal opportunities and better futures for all children and families, especially those most often left behind. Underlying all of the work is a vision of a child, family and community well-being which serves as a unifying framework for the many policy, system reform, and community change activities in which CSSP engages.

Published January 2018

Acknowledgments

The authors are grateful for the unique insights and recommendations supplied by the following colleagues in response to drafts of this brief:

- Samantha Morton, JD - CEO, MLPB
- Vernellia R. Randall, JD, RN - Professor Emerita of Law, University of Dayton
- Jeanne M. Paccia, PhD - Director/Pediatric Psychologist, Fernandes Center for Children & Families (Steward-St. Anne's Hospital)

Their contributions considerably enriched the final product.

We also thank Shadi Houshyar, Donna Cohen Ross, Sahare Wazirali, Ciara Malaugh, Viet Tran and Cailin O'Connor for their assistance with the production and review of this brief.

Suggested citation:

Boynton-Jarrett, R. & Flacks, J. (2018). *Strengths-based Approaches to Screening Families for Health-related Social Needs in the Healthcare Setting*. Washington, DC.

A. Introduction

In the healthcare field – especially in pediatrics – significant work is being done to refine screening approaches to detect health-related social needs (HRSN)^{i,1} and to develop effective strategies to help meet families’ needs when they are identified.² Whenever screening is undertaken, it is critical that families are respected and not diminished in the process.

This brief builds on recent scholarship on how to avoid unintended consequences when screening for health-related social needs^{ii,3} and presents six recommendations for operationalizing a strengths-based approach to such screening. These recommendations are informed by the *Strengthening Families* framework⁴ and the five Protective Factors that serve as its foundation.

When the Centers for Medicare Services and Medicaid Services (CMS) unveiled its *Accountable Health Communities* program in 2015, it coined the term “health-related social needs” and prioritized the following five domains, representing a core subset of social determinants of health:⁵

- Housing instability;
- Food insecurity;
- Transportation needs;
- Utility needs; and
- Interpersonal safety.



Strengthening Families

Strengthening Families™ is a research-informed approach to increase family strengths, enhance child development and reduce the likelihood of child abuse and neglect. It is based on engaging families, programs and communities in building five protective factors:

- *Parental resilience:* Managing stress and functioning well when faced with challenges, adversity and trauma including historical family and community trauma.
- *Social connections:* Positive relationships that provide emotional, informational, instrumental and spiritual support.
- *Knowledge of parenting and child development:* Understanding strategies that support physical, cognitive, language, social and emotional development.
- *Concrete support in times of need:* Access to concrete support and services that address a family’s needs and help minimize stress caused by challenges.
- *Social and emotional competence of children:* Family and child interactions that help children develop the ability to communicate clearly, recognize and regulate their emotions and establish and maintain relationships.

Using the Strengthening Families framework, more than 35 states are shifting policy and practice to help programs working with children and families focus on protective factors. States apply the Strengthening Families approach in early childhood, child welfare, child abuse prevention and other child and family serving systems. For more information, visit www.strengtheningfamilies.net.

ⁱ The term Health-Related Social Needs (HRSNs) refers to non-medical factors that drive health care utilization and impact health outcomes. The Centers for Medicare & Medicaid Services (CMS) *Accountable Health Communities* Model supports promising service delivery approaches aimed at linking beneficiaries with community services that may address health-related social needs in five domains (i.e., housing instability, food insecurity, transportation difficulties, utility assistance needs and interpersonal safety).

ⁱⁱ These principles include: 1) Ensuring that HRSN screening is person-centered; 2) Integrating HRSN screening with referral and linkage to community-based resources; 3) Screening within the context of a comprehensive systems approach; 4) Not limiting screening practices based on documented or assumed membership in particular social groups; 5) Acknowledging and building upon family strengths.

These areas – especially as they relate to food, energy, and housing security – coincide with the “concrete supports” protective factor prioritized in promoting family strength and stability.

The six recommendations are as follows:

1. *Involve families and communities in the development of screening tools and protocols.*
2. *Screen for both risk factors and protective factors.*
3. *Set person-centered screening priorities within the universe of health-related social needs.*
4. *Ensure that screening is conducted by care teamⁱⁱⁱ members trained and supervised in strengths-based approaches.*
5. *Recognize that screening for health-related social needs is not risk-free for families, and proceed accordingly.*
6. *Acknowledge family-level risks and strengths in a broader historical context.*

The association between poor health and a person’s social context – including socioeconomic status⁶ (specifically, poverty) and racism^{7,8,9} -- is well-established. When social determinants of good health are optimized, a family has consistent access to:

- Safe and stable housing;
- Adequate, nutritious food;
- Economic and job opportunities;
- Health care services;
- Quality education and job training;
- Transportation options;
- Communication and information technology;
- Recreation activities and culture; and
- Public safety.^{10,iv}

Poverty limits access to many of these resources, and can have a substantial harmful impact on child health and well-being. In the U.S. in 2015:

- Twenty-one percent (one in five) of all children under 18 years of age lived in a family with income below the poverty level – which in 2015 was \$24,036 for a family of four with two children;

- Forty-three percent of all children under 18 years of age lived in low-income families (defined as households with incomes at or below 200 percent of the federal poverty level);

- Over 60 percent of Native American, Black and children lived in low income families, compared with thirty percent of White children; and

- Over 30 percent of Native American, Black and Latino children lived in families with income below the federal poverty level, compared with 12 percent of White children.¹¹

The disproportionate prevalence of poverty among children of color compounds racial and ethnic health disparities. This intersection is especially profound in the context of residential racial segregation.¹²

Screening for health-related social needs presents unique opportunities but also challenges, both for care teams and families. Pediatric practices now are equipped with a range of social needs screening tools to choose from,¹³ but often lack a framework for how to assure that each screening encounter is effective, high-quality and family-centered. The stakes are high. Questions about social needs may cause families to feel that they are being blamed for having these needs or that they should be ashamed of their social circumstances. They may fear that acknowledging their needs could trigger serious consequences, such as having their child removed from their care. Yet effective screening is essential to identifying a need for specific concrete supports, potential barriers to those supports and connecting families to resources and services.

At the family level, resolution of these needs can prevent individual and family crises and promote optimal health and family stability. At the system level, successful social screening encounters – above and beyond traditional clinical and behavioral health screening interactions – can improve care quality and contain costs by detecting drivers of unnecessary healthcare utilization, such as harmful housing conditions. It is critical that screening families for health-related social needs be done in a way that builds rather than undermines trust with families and honors the agency of caregivers in problem-solving.

The adverse consequences of child poverty extend into adulthood and negatively impact population health and the vitality of our society.

ⁱⁱⁱ We use the term “care team” to encapsulate all members of the healthcare and allied health workforces charged with collaborating to meet patients’ needs – both in general, and with regard to HRSN in particular. Screening responsibility may vary within and across teams, and depending on circumstances may reside with a pediatrician, a nurse, a social worker, a patient navigator, a *promotora de salud*, or any number of other job titles under the emerging “Community Health Worker” umbrella.

^{iv} This is in addition to freedom from health-harming factors including concentrated poverty, discrimination, language barriers, racial segregation and social isolation.

B. Screening Families for Health-Related Social Needs in Ways that Acknowledge Their Strengths: Six Recommendations

The field of pediatrics is in the vanguard in terms of adopting and implementing formal social needs screening protocols.^{14,15} This leadership reflects recognition of the long-term consequences that adversities early in life can have on health and social mobility over the life course.¹⁶ Both screening for social needs and connecting families with appropriate resources can be enhanced by using a strengths-based approach that can inform a variety of child health and well-being interventions. These six recommendations can guide strengths-based screening:

1. Involve families and communities in the development of screening tools and protocols

Caregivers^v are the subject-matter experts on their own lives and their children's lives. A strengths-based approach to composing screening questions and determining protocols for how such questions are posed requires that the intended beneficiaries inform both the content and the process. Caregivers should be consulted as experts on how screening questions could be perceived by families, as opposed to relying on the assumptions of care teams. This should happen before any social screening administration protocols are finalized.

Incorporating insights from community members can strengthen health-related screening and interventions.

Recommendation in Action

Practitioners in the field of Community Based Participatory Research (CBPR) incorporate insights from community members to improve the quality of screening tools, better align interventions and increase caregiver comfort with the screening process. The experience of CBPR practitioners has found that engaging community stakeholders in designing the social needs screening process can help to reduce health disparities; efforts with youth indicated improved mental health outcomes, increased self-efficacy and collective efficacy, and were associated with better school achievement.¹⁷

2. Screen for both risk factors and protective factors

An effective screening process designed to identify health-related social needs must go beyond screening solely for risks.¹⁸ It must include features capable of revealing buffering strengths, or protective factors, that can identify existing family assets, strengths and social supports that can help prevent risks from becoming real needs and can help practitioners arrive at a more accurate assessment of a family's problem-solving capacities. Elevating families' strengths also can empower caregivers to take an active role in developing and prioritizing solutions.¹⁹ For example, it is important not to assume that families need help or want help addressing every need.



Screening for strengths also helps address a common concern raised by providers when considering screening for social needs: “fear of the empty toolbox.” Providers may find it problematic to imagine identifying needs, without having the ability to connect families to appropriate assistance or resources. This can result in no screening at all, or referring families outside the practice for such screening. As an illustration, rather than screening only for risk of social isolation with a question that asks about isolation on an agree/disagree scale, strengths-based screening by pediatric clinicians and staff can provide an opportunity to engage caregivers in the process of mapping their social network. This invites them to consider, for example, who might help them if they needed a babysitter on short notice in order to make it to work on time. While this approach can reveal true isolation

^v Families are diverse. For clarity we use the term “caregivers” throughout the remainder of this paper acknowledging that a parenting role may be played by caregivers of different formal or informal kinship statuses – including parents, grandparents, aunts, uncles, or friends of the family. The recommendations in this paper are equally relevant regardless of the relationship giving rise to the caregiver's parenting role.

requiring intensive assistance, it also can identify assets that are a source of strength for families – assets that may not have been top of mind in response to a simple social isolation question. Screening across the full strength/risk continuum increases the likelihood that the “toolbox” will not be completely empty.

Recommendation in Action

The *Child and Adolescent Needs and Strengths (CANS) Assessment Tool* screens youth over age 5 based on research findings that “optimally effective treatment of children and youth should include both efforts to reduce symptomatology and efforts to use and build strengths.”²⁰ In its family screening *User Guide*, the CANS tool emphasizes, “Remember, this is not a ‘form’ to be completed, but the reflection of a story that needs to be heard.” Effective screening should draw out the richness of a family’s story so that a caregiver can see beyond the one dimension of yes/no questions that screen for risk, and identify sources of strength that may not have been readily apparent.

Incorporating an assessment of family protective factors into screening organically spotlights strategies that may be available to address HRSN within a network of existing familial assets, strengths and social supports.

We Care[™] is an example of an SDOH screening tool that embeds this consideration in its screening framework.^{21,22}

3. Set realistic, family-driven screening priorities within the universe of health-related social needs

The universe of health-related social needs is large and daunting. Given the overwhelming needs that many families face, homing in on achievable goals and next steps is critical. Pediatrics-based social screening – often conducted within the confines of a 20-minute visit – should focus on priority domains, should be realistic in scope and follow the family’s lead on whether they wish to dive deeper.

In a strengths-based context, care teams that commit to a set of priority screening domains will be more able to respond meaningfully when families screen positive for those needs – especially if the prioritized domains have remedies under current law and public policy. In this way, embracing screening priorities is family-centered, realistic and efficient. Priority-setting of this kind also presents an opportunity to normalize need, empower families to contribute their own problem-solving skills and offer support.

Priority-setting has the added benefit of preserving time so that the practitioner can embrace a universal screening approach. This approach does not target particular “at-risk” families for screening and instead communicates to caregivers that all families are screened. This reduces the risk of stigmatizing or alienating families and increases the likelihood that the screening process will be successful. This means fewer missed opportunities to help, which results in more equitable help.

Recommendation in Action

Preventing “Check-list check-out”:

A member of the care team says to a caregiver: “OK, sorry for rushing, I know you’re busy too. I’m going to ask you a bunch of questions. Just respond yes or no:

- Any problems at school?
- Do you and your kids feel safe at home?
- Do you ever feel down in the dumps?
- Are you all set with housing and food?”

Caregivers may respond to these questions with what could be termed a “check-list check-out” reaction. Simply reframing one of these “yes/no” questions in an open-ended strengths-based way can help the caregiver check back “in” to the interaction and leave them feeling more empowered and less stressed. For example, consider this alternative script on the subject of housing stability:

“I spend a moment more on housing with all the caregivers I talk to, because many families find that the rent bill is too big and pay and benefit checks are too little. We want to help with this if we can, especially given that heating bills will start coming in, too. What strategies did you use to get by last year during heating season? Would you like to brainstorm together about what could help this year?”

4. Ensure that screening is administered by care team members who are trained and supervised in strengths-based approaches

Those who conduct social needs screening encounters with families must be strengths-based practitioners, with training and experience in the core competencies of trauma-informed and culturally effective care. Because members of the screening workforce inevitably bring varied experience – lived, academic, and professional – programs must assure that all members receive baseline (and ongoing) training on how to apply the full spectrum of Strengthening Families[™] Principles. Among other strengths-based skills, trauma-informed communication with caregivers needs to be a core competency in order for screening on health-related social needs to maximize effectiveness and prevent harm.

Engaging with caregivers on subjects tied to high levels of toxic stress²³ is a high-stakes activity, both for the care

team member charged with asking the questions and the parent invited to answer those questions. While many patients may be accustomed to sharing information about their physical health, questions that delve into non-clinical areas may be disorienting or threatening. This is especially so for individuals who are members of marginalized populations that may more frequently experience these kinds of inquiries as judgmental.

Moreover, screening for health-related social needs is an important opportunity to activate the Concrete Supports protective factor with families – a specific action-oriented strategy in which caregivers can participate – as opposed to leaning unsustainably on parental resilience as a primary buffer of toxic stress. Providers need to avoid screening approaches that could seem to hold families individually accountable for adversities that have structural roots with no short-term solutions, and which therefore require families to draw upon their resilience alone.

All members of the healthcare workforce will benefit from training on culturally competent care and how to recognize and mitigate implicit bias. Appropriate training will equip providers to identify and eliminate potentially alienating lines or styles of questioning, and institute productive strategies for patient-centered engagement in the screening process. Doing so can lead to more meaningful screening results and consistent patient engagement by building a foundation of trust with families.^{24,25}

One way to reduce the risk of stigmatizing or alienating families is to embrace a universal screening approach – one that does not target particular “at-risk” families for a unique screening encounter.

Cultural appropriateness is part of trauma-informed care. It requires attention to language differences between patients and providers, as well as health literacy and avoiding practices that may unintentionally undermine the dignity of families with health-related social needs. Training on trauma-informed practices addresses the impact not only of personal traumas on individuals but also of historical traumas on individuals, families and communities. This is discussed further below under Recommendations 5 and 6.

Recommendation in Action

Pediatric practices have been supported by sound best practice guidelines for some time. The Institute of Medicine has prioritized, as one of several core competencies for healthcare professionals, the recognition of culture and values as factors that influence victims’ perspectives on intimate partner violence (IPV).²⁶ Therefore, providers should be sensitive to socio-cultural differences that

influence one’s willingness to disclose IPV. For example, a victim who has had traumatizing encounters with law enforcement in the past may be concerned that disclosing abuse will trigger dangerous interactions with law enforcement, for her and/or her abusive partner. Similarly, past experiences may lead to negative parent perceptions of mental and behavioral health services that might be recommended in an IPV context and difficulty with the logistics of participating in services for their children.²⁷ Having a history of trauma or maltreatment and belonging to a cultural or ethnic minority group are both predictors of premature disengagement from treatment.²⁸

A qualitative study of 59 mothers who brought their child to the pediatrics emergency department, published in *JAMA Pediatrics* in 2002, found that with respect to screening for IPV, caregivers rated the following qualities as critical for providers: demonstrating empathy, addressing first the child’s medical needs, having an organized approach, and providing services.²⁹ In the case of family violence, the American Academy of Pediatrics recommends providers use a sensitive and skillful manner to intervene with primary attention to the safety of the caretaker and the child.³⁰ However, a strengths-based framework can substantially enhance these recommended practices with support for parental resilience in the context of any intervention to mitigate social adversities. This requires patience without judgment because resilience comes from the inside. Providers can help cultivate caregivers’ resilience by asking questions that (a) validate a right to safety, and (b) build a relationship of respect and trust in which an IPV victim, if she is or becomes a victim, will feel comfortable disclosing her need when she is ready.³¹ Training providers and staff in these principles is critical to this kind of strengths-based screening.



5. Recognize that social needs screening is not risk-free for families

Health and human services professionals are duty-bound to protect families from collateral harm when they are taking steps to identify needs and address them. Thus, screening design must acknowledge several barriers to open dialogue between caregivers and those charged with screening them for health-related social needs:

- Caregivers may worry that by acknowledging unmet basic needs, they may be opening the door to charges of child neglect or abuse, as to which pediatricians and their clinical colleagues are mandated reporters to child protective services (CPS).^{32,vi}
- Caregivers may be concerned that if they disclose unmet basic needs, they may be viewed as “to blame” for the problem.
- Caregivers may feel that disclosing a problem with no conceivable near-term solution – such as housing instability tied to the insufficient supply of affordable housing – is simply not worth sharing, or too tied to feelings of despair to discuss in this setting, if at all.

Recommendation in Action

An example of this consideration in action draws upon recommendations regarding cultural competence and implicit bias training and acknowledgment of historical traumas.

Accounting for racial and ethnic disparities in Child Protective Services reporting:

Children who belong to racial and ethnic minority groups are more likely to be evaluated and reported for suspected child abuse in clinical settings.^{33,34} Since this presents an obvious barrier to full forthrightness about serious material hardship, caregivers may forego an opportunity for concrete support in a time of need. One disparity then leads to another.

That healthcare providers are widely considered among the most trusted professionals³⁵ presents an opportunity – and also vests in providers a responsibility – to approach health-related social needs screening with awareness that a family’s past history with CPS (whether personal or vicarious) may inhibit disclosure of social needs. Having had negative experiences with healthcare or social services,

including child protective services, can be traumatizing for families, thus caregivers can be triggered by a screening intervention that may have the potential to lead to similar outcomes. Achieving this awareness through training is an important first step in preparing providers and staff for screening encounters that build trust with families, rather than undermine it.

6. Acknowledge family-level risks and strengths in broader historical context

Screening should not be limited to familial and personal behaviors, but also involve an assessment of the neighborhood environment, with attention to structural racism and other drivers of health inequities. Strengths-based social needs screening is conducted at the family level. While large-scale policy drivers of health-related social needs – such as nationwide gaps in affordable housing – will not be solved at the family level, intentional acknowledgment of factors that families likely cannot change on their own can help prevent these screening interactions from alienating families by implicitly assigning them responsibility.

Acknowledging the experiences of families, particularly contextualizing how structural violence^{vii,36} and societal systems of oppression contribute to risk for chronic housing insecurity, exposure to community violence or underemployment, is validating and therefore may improve engagement in the screening and referral process. It can communicate honesty and mitigates the risk of implicitly “overpromising” by asking questions as to which there may be no easy answers. Only with a foundation of candor about root causes that reside outside the family, can trust and resilient responses be cultivated in a social screening encounter.

Strengths-based and trauma-informed advocacy calls upon care providers to consider the historical context of oppression reflected in the health-related social needs as to which screening is conducted. Adverse social settings and structural racism both are associated with family adversities and negatively impact child health, development, and social mobility.^{7,37,38,39} There is indisputable medical and public health research establishing the association between social factors, neighborhood environments and morbidity and mortality. Yet, there is reluctance among many physicians to address the role of racism and consider how medical practices reinforce stereotypes.^{7,36,40} Providers often contextualize health risks in relation to family systems, family history, and lifestyles. Extending this

^{vi} Having outlined some perils to avoid and opportunities to seize in the effort to advance HRSN screening practice, an unacknowledged peril is letting the perfect be the enemy of the good: while refining screening tools, another generation easily could advance out of early childhood without the benefit of any HRSN screening at all, thereby missing the opportunity to benefit from useful screening tools as a preventive intervention. One bright spot to reduce that risk is the apparent higher credibility enjoyed by qualitative evidence in the HRSN domain compared with other areas of clinical research. This may afford screening tool developers purchase against the dominant research culture that holds up RCTs as the gold-standard for building an evidence base. Given that HRSN are inherently intersectional, the RCT method is too inflexible to account for the many variables affecting people’s real lives.

^{vii} The term ‘structural violence’ is one way of describing social arrangements that put individuals and populations in harm’s way.

process to include the broader social context responsibly protects patients from feeling at fault, ineffective, and thus depressed, and is also an accurate representation of what is known from research.

Providers have a moral and professional obligation to avoid screening approaches and associated intervention models that may create a sense of shame, or that blame families for structural socio-economic conditions.

Poverty and trauma are disproportionately prevalent among populations in the United States that have been systematically oppressed.^{41,42,43,44} The inequitable *status quo* arises from long chapters in history, law and public policy, including:

- The colonization of land populated by indigenous peoples for millennia before a border was imposed dividing today's Mexico from the southwestern US;⁴⁵
- Enslavement of African peoples for centuries, subsequent government-sanctioned segregation of African-Americans from economic opportunity and continuing racial oppression of Descendants of Africans Enslaved in the United States (DAEUS)^{36,viii} that directly drives today's widening racial wealth gap and related health inequities;^{7,46,47,48,49,50}
- Invisibility and neglect of stark socioeconomic and health disparities among Asian American and Pacific Islander populations because data collection

and analysis systems treat distinct populations with vastly different heritages and needs as a single group;⁵¹

- Disenfranchisement and reproductive control of women and increasing threats to reproductive freedom today;⁵² and

- Denial of basic civil rights to LGBTQI^{ix} people that persists in many states.⁵³

Bearing this background in mind, failure to acknowledge the contributions of systemic inequities to health while encouraging caregivers to do more to improve their child's health can be undermining and disempowering. For a variety of reasons ranging from degree of education to seriousness of responsibility, medical professionals' opinions tend to be respected by caregivers. Thus, their affirmative acknowledgement of historical context for adversity can be a powerful way to engage caregivers around those individual actions that can be impactful.

There are a variety of ways to approach this complex task, ranging from symbolic statements to formal statements of purpose in the design of interventions.

Recommendation in Action

Creating a "safe space" for screening encounters:

In essence, calling upon providers to acknowledge a context of societal inequity serves a purpose akin to the "safe space" movement. Sometimes a visual display like a rainbow flag or pink triangle sticker communicates awareness of and rejection of bias against LGBTQI people.⁵⁴ While there is no one-size-fits-all visual that effectively communicates informed empathy across all cultures, providers can and should make an effort to do so in other ways. This can

^{viii} The term DAEUS acknowledges the historical origins of anti-black racism, white supremacy, and economic and health inequities that uniquely burden Americans of African descent whose ancestors were enslaved in the United States. The DAEUS experience is distinct from that of non-DAEUS persons of African descent, including recent immigrants, whose ancestors were not survivors of the trans-Atlantic slave trade. Refer to endnote 36.

^{ix} Lesbian, Gay, Bisexual, Transgender, Queer or Questioning, and Intersex



include references supporting public health research on disparities, systemic inequities, and the broader social context during the screening process. This in turn requires professional development and training of providers and staff in awareness of systemic inequities and how they drive health-related social needs across populations, including specific training on the impact of implicit bias on access to quality health care.⁵⁵



Taking the first step to support caregivers in reflection about the social ecology of their need:

Interactions of this kind inherently require customization to individual families and provider relationships, but a few sample case studies are instructive.

■ African American mother of premature newborn, lost her job due to extended leave caring for premature child and then recently evicted due to loss of income from work to pay rent. Family presents to the ER because the newborn has congestion and mother reports homelessness and that they are living in their car. ER department reports the family to CPS. A hospital may have a policy of reporting any

parent of an infant who is living in their car to CPS. A provider can support a family in this crisis by acknowledging (a) the specificity of the mandated reporting role; (b) the lack of affordable housing; (c) the disproportionate need for affordable housing due to race discrimination in the housing market (d) insufficient parental leave policies that led to job loss; and (e) the public health research indicating that the experience of racism contributes to preterm births regardless of income level. If this mother's trust can be earned, she may be able to engage in health-related social needs screening that will enable her to engage productively with CPS, receive supports to provide for her baby and demonstrate resilience in the face of many layers of trauma.

■ Family resides in neighborhood with concentrated disadvantage, lack of thriving businesses, no banks or supermarkets, predatory pay-day lending and few quality childcare options. Mother reports child is noted to be behind at the beginning of early Head Start preschool. Acknowledge strength of family for enrolling child in early Head Start and acknowledge the broader social context with low teacher-to-child ratios, concentrated disadvantage and lack of child enrichment. Orient this in a larger historical context (e.g. residential racial segregation, tax-revenue based economic development). This non-judgmental candor may foster engagement with strengths-based screening including social network mapping that identifies (a) the child and family's gifts and (b) their social network's resources, around which feasible therapeutic interventions can be tailored.

The changes to United States immigration policy in 2017 provides a useful context for illustrating this recommendation in concert with the preceding recommendations.

C. Screening for Health-Related Social Needs with Immigrant Families

Immigrants entering the healthcare system share with U.S.-born patients the same predictable stresses about health problems, navigation of large bureaucracies, and power imbalance in the patient-clinician relationship. Immigrants, however, bring unique strengths and risks both of which should be accounted for in development of screening processes that will benefit immigrant patients. While fear of detection by immigration enforcement officials long has impeded many undocumented immigrant families' engagement with preventive and even emergency healthcare, in 2017, providers and advocates have observed increasing disengagement among immigrant patients, with and without documentation.⁵⁶ Understandably, screenings of virtually any kind may feel risky, especially those that seem remote from traditional healthcare subject matter, and even more so, those that address immigration issues head-on.

Historical trauma impacting screening engagement:

For many immigrants, trauma in the home country related to maltreatment by government officials can provoke rational suspicion of any screening questions that refer to government processes – including processes that may address health-related social needs. For these reasons, engaging in trust-building before screening is especially crucial and has to be specially tailored if we are to reach diverse immigrant populations supportively. A strength of many immigrant communities can be brought to bear in meeting this challenge, as described in the next paragraph.

Community engagement can increase screening engagement:

For centuries, people have arrived in a particular area of the U.S. (or neighborhood within a U.S. city) because

immigrants from their homeland have already built community there. These immigrant enclaves are home to many in the existing and growing community health worker workforce who can inform screening protocols that will serve (rather than further stress) immigrant populations.

Best practices to earn trust include:

- Affirmative transparency that any questions about immigration status are for benefit eligibility evaluation purposes only and will not be recorded without permission;
- Vigilance around avoiding references to immigration status in health records;⁵⁷
- Gestures as simple as closing a notebook and setting aside a pen, or turning away from a keyboard can communicate utmost respect for the family's privacy;
- Linguistic appropriateness of all oral and written information;
- Accessibility regardless of literacy level by ensuring that relevant legal information is shared both orally and in writing;
- Legal advocacy resource curation so providers can point immigrant patients/clients toward qualified and sometimes free or affordable assistance, and;
- Acknowledgement of the historical context in which restrictive immigration policy is situated and candor that there may not be immediate pathways to citizenship if that is desired, but that there are many strong allies within and outside their community to whom they can be connected should that be of interest.⁵⁸



IV: Conclusion

The long-term consequences of social adversities on population health are increasingly acknowledged. This contributes to the growing interest in screening for health-related social needs and screening in the pediatric setting holds particular promise for its primary prevention power.^{15,59} Effective screening is indispensable if pediatric health care providers are to identify and address health-related social needs. When pediatric screening leads to health-related social needs alleviation, pediatricians and their colleagues may help prevent and mitigate the health effects of social adversity for families, for children and for the adults that children will become.

Grounded in the *Strengthening Families* protective factors framework, we recommend that efforts to implement and innovate health-related screening in pediatrics settings should:

- Involve families and communities in the development of screening tools and protocols.
- Screen for both risk factors and protective factors.

- Set person-centered screening priorities within the universe of health-related social needs.
- Ensure that screening is conducted by care team members trained and supervised in strengths-based approaches.
- Recognize that screening for health-related social needs is not risk-free for families.
- Acknowledge family-level risks and strengths in a broader historical context.

We currently have a window of opportunity to link the known benefits of promoting family resilience using the Protective Factors framework with evidence-informed screening tools to detect health-related social needs. If systematic social screening efforts are to be useful to families and feasible for pediatric clinics, family-centered design principles and administration protocols – including the six referenced here – must be the foundation.



V. Endnotes

1. Alley, D. E., Asomugha, C. N., Conway, P. H., & Sanghavi, D. M. (2016). Accountable Health Communities — Addressing Social Needs through Medicare and Medicaid. *New England Journal of Medicine*, 374(1), 8-11. doi:10.1056/nejmp151253
2. McGovern, L., Miller, G., and Hughes, P. (2014, August). The Relative Contribution of Multiple Determinants to Health Outcomes. *Health Policy Brief*. doi: 10.1377/hpb20140821.404487
3. Garg, A., Boynton-Jarrett, R., & Dworkin, P. H. (2016). Avoiding the Unintended Consequences of Screening for Social Determinants of Health. *JAMA*, 316(8), 813. doi:10.1001/jama.2016.9282.
4. Browne, C. (2014, September). *The Strengthening Families Approach and Protective Factors Framework: Branching out and reaching deeper*. Washington, DC: Center for the Study of Social Policy. Retrieved from: <https://www.cssp.org/reform/strengtheningfamilies/2014/The-Strengthening-Families-Approach-and-Protective-Factors-Framework-Branching-Out-and-Reaching-Deeper.pdf>
5. Accountable Health Communities Model. (2017, September 5). Retrieved from <https://innovation.cms.gov/initiatives/AHCM>
6. Cutler, D., Lleras-Muney, A., & Vogl, T. (2008). Socioeconomic Status and Health: Dimensions and Mechanisms. doi:10.3386/w14333
7. Randall, V. R. (2006). *Dying While Black*. Dayton, OH. Seven Principles Press.
8. Wallace, M. E., Mendola, P., Liu, D., & Grantz, K. L. (2015). Joint Effects of Structural Racism and Income Inequality on Small-for-Gestational-Age Birth [Abstract]. *American Journal of Public Health*, 105(8), 1681-1688. doi:10.2105/ajph.2015.302613
9. Racial Discrimination and Adverse Birth Outcomes: An Integrative Review; Jeanne L. Alhusen, PhD, CRNP, RN, Kelly Bower, PhD, RN, Elizabeth Epstein, PhD, RN, and Phyllis Sharps, PhD, RN, FAAN J *Midwifery Womens Health*. 2016 Nov;61(6):707-720. doi: 10.1111/jmwh.12490. Epub 2016 Oct 13.
10. Social Determinants of Health. (n.d.). Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>
11. Jiang, Y., Granja, M. R., & Koball, H. (2017). *Basic Facts about Low-Income Children* [Pamphlet]. New York: National Center for Children in Poverty. Retrieved from http://www.nccp.org/publications/pdf/text_1170.pdf
12. Williams, D. R., Mohammed, S. A., Leavell, J. and Collins, C. (2010), Race, socioeconomic status, and health: Complexities, ongoing challenges, and research opportunities. *Annals of the New York Academy of Sciences*, 1186: 69–101. doi:10.1111/j.1749-6632.2009.05339
13. *Social Determinants of Health*. (n.d.). Retrieved June 1, 2017, from <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Screening/Pages/Social-Determinants-of-Health.aspx>
14. Chung EK, Siegel BS, Garg A, Conroy K, Gross RS, Long DA, Lewis G. ... Osman CJ. Screening for Social Determinants of Health Among Children and Families Living in Poverty: A Guide for Clinicians. *Current Problems in Pediatric and Adolescent Health Care*. 2016 May;46(5):135-53. doi: 10.1016/j.cppeds.2016.02.004.
15. Fierman, A. H., Beck, A. F., Chung, E. K., Tschudy, M. M., Coker, T. R., Mistry, K. B., . . . Cox, J. (2016). Redesigning Health Care Practices to Address Childhood Poverty. *Academic Pediatrics*, 16(3). doi:10.1016/j.acap.2016.01.004. Retrieved June 1, 2017, from <https://www.ncbi.nlm.nih.gov/pubmed/27044692>
16. Sege, R., Bethell, C., Linkenbach, J., Jones, J., Klika, B. & Pecora, P.J (2017). *Executive Summary: Balancing Adverse Childhood Experiences with Hope: Insights into the Role of Positive Experience on Child and Family Development*. Washington, DC. Center for the Study of Social Policy Retrieved from <http://www.cssp.org/publications/documents/HOPE-Executive-Summary.pdf>;
17. Wallerstein NB, Duran B. (2006, July 1). Using Community-Based Participatory Research to Address Health Disparities. *Health Promotion and Practice* 2006; 7; 312. doi: 10.1177/1524839906289376
18. Garg, A., Boynton-Jarrett, R., & Dworkin, P. H. (2016). Avoiding the Unintended Consequences of Screening for Social Determinants of Health. *Jama*, 316(8), 813. doi:10.1001/jama.2016.9282
19. *Strength Based Approach: Healthy Active Living for Families Implementation Guide*. (n.d.). Retrieved June 1, 2017 from <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/HALF-Implementation-Guide/communicating-with-families/pages/Strength-Based-Approach.aspx>
20. Child and Adolescent Needs and Strengths Assessment (CANS). (n.d.). Retrieved June 1, 2017, from <https://www.sccgov.org/sites/bhd/partners/QI/CANS/Pages/default.aspx>
21. Garg, A., Toy, S., Tripodis, Y., Silverstein, M., & Freeman, E. (2015). Addressing Social Determinants of Health at Well Child Care Visits: A Cluster RCT. *Pediatrics*, 135(2). doi:10.1542/peds.2014-2888d

22. WE CARE Survey [Supplemental Information]. *Pediatrics* 135(2). (2015, February). Retrieved from <http://pediatrics.aappublications.org/content/pediatrics/suppl/2015/01/02/peds.2014-2888.DCSupplemental/peds.2014-2888SupplementaryData.pdf>
23. ACEs and Toxic Stress. *American Academy of Pediatrics*. Retrieved December 8, 2017, from <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/resilience/Pages/ACEs-and-Toxic-Stress.aspx>
24. Born, W., Engelman, K., Greiner, K. A., Bhattacharya, S. B., Hall, S., Hou, Q., & Ahluwalia, J. S. (2009). Colorectal cancer screening, perceived discrimination, and low-income and trust in doctors: a survey of minority patients. *BMC Public Health*, 9(1). doi:10.1186/1471-2458-9-363
25. Ganzini, L., Denneson, L. M., Press, N., Bair, M. J., Helmer, D. A., Poat, J., & Dobscha, S. K. (2013). Trust is the Basis for Effective Suicide Risk Screening and Assessment in Veterans. *Journal of General Internal Medicine*, 28(9), 1215-1221. doi:10.1007/s11606-013-2412-6
26. Cohn F, Salmon ME, & Stobo JD. *Confronting Chronic Neglect: The Education and Training of Health Professionals on Family Violence/Committee on the Training Needs of Health Professionals to Respond to Family Violence*. Washington, DC: National Academy Press; 2002
27. Harrison, M. E., McKay, M. M., & Bannon, J. W. (2004). Inner-City Child Mental Health Service Use: The Real Question Is Why Youth and Families Do Not Use Services. *Community Mental Health Journal*, 40(2), 119-131. doi:10.1023/b:comh.0000022732.80714.8b
28. Dorsey S, Conover KL, Revillion Cox J. (2014, March 10). Improving foster parent engagement: using qualitative methods to guide tailoring of evidence-based engagement strategies. *Journal of Clinical Child and Adolescent Psychology*.43(6), 877-889. doi:10.1080/15374416.2013.876643.
29. Dowd, M. D., Kennedy, C., Knapp, J. F., & Stallbaumer-Rouyer, J. (2002). Mothers' and health care providers' perspectives on screening for intimate partner violence in a pediatric emergency department. *Archives of Pediatrics & Adolescent Medicine*, 156(8), 794-799.
30. Thackeray, J. D., Hibbard, R., Dowd, M. D., Committee on Child Abuse and Neglect, & Committee on Injury, Violence, and Poison Prevention.(2010). Intimate partner violence: the role of the pediatrician. *Pediatrics*, 125(5), 1094-1100.
31. Berthold, J. (2009, March). Asking right questions key to detecting abuse. *ACP Internist*. Retrieved from <https://acpinternist.org/archives/2009/03/abuse.htm>
32. Bales, S., Jolin, M., Berwick, D., Kania, J., Gladwell, A. G., Kendall-Taylor, N., . . . Sparrow, J. (n.d.). *A Consensus Statement on Conclusive Evidence*. In Center for Study of Social Policy. Retrieved from <https://www.cssp.org/policy/Friends-of-Evidence-Consensus-Statement.pdf>
33. Lane, W. G. (2002). Racial Differences in the Evaluation of Pediatric Fractures for Physical Abuse. *Jama*, 288(13), 1603. doi:10.1001/jama.288.13.1603.
34. Wood, Joanne N., et al. Disparities in the evaluation and diagnosis of abuse among infants with traumatic brain injury. *Pediatrics* 126.3 (2010): 408-414
35. Why nurses again top Gallup's list of 'most trusted' professionals. (2015, January 5). *Advisory Board*. Retrieved from <https://www.advisory.com/daily-briefing/2015/01/05/why-nurses-again-top-gallups-list-of-most-trusted-professionals>
36. Farmer, P. E., Nizeye, B., Stulac, S., & Keshavjee, S. (2006). Structural Violence and Clinical Medicine. *PLoS Medicine*,3(10). doi:10.1371/journal.pmed.0030449 (Retrieved 12/8/2017)
37. Chetty, R., & Hendren, N. (2015). The impacts of neighborhoods on intergenerational mobility: Childhood exposure effects and county-level estimates. *Harvard University and NBER*. Retrieved from http://scholar.harvard.edu/files/hendren/files/nbhds_paper.pdf
38. Earls, F., & Carlson, M. (2001) The social ecology of child health and well-being. *Annual review of public health*, 22(1), 143-166
39. Vernellia R. Randall. Status of Descendants of Africans Enslaved in the United States (DAEUS) and the United States' Violation of the Convention on the Elimination of All Forms Racial Discrimination (CERD); Response to the Periodic Report of the United States of June 12, 2013, accompanied by the Common Core Document <http://bit.ly/DAEUSReport> (Last Visited: May 8, 2017)
40. Bassett, M. T. (2015). #BlackLivesMatter — A Challenge to the Medical and Public Health Communities. *New England Journal of Medicine*, 372(12), 1085-1087. doi:10.1056/nejmp1500529
41. Krogstad, Jens M. (2014, June 13). *One-in-four Native Americans and Alaska Natives are living in poverty*. Retrieved from <http://www.pewresearch.org/fact-tank/2014/06/13/1-in-4-native-americans-and-alaska-natives-are-living-in-poverty/>
42. Sears, B., & Lee B. (2012, June). *Beyond Stereotypes: Poverty in the LGBT Community*. Retrieved from <https://williamsinstitute.law.ucla.edu/headlines/beyond-stereotypes-poverty-in-the-lgbt-community/>
43. Ubri, P., & Artiga, S. (2016, August). *Disparities in Health and Health Care: Five Key Questions and Answers* (Issue brief). Retrieved from <http://www.kff.org/disparities-policy/issue-brief/>

[disparities-in-health-and-health-care-five-key-questions-and-answers](#)

44. *Who is Poor?* (n.d.). Retrieved from <http://www.irc.wisc.edu/faqs/faq3.htm>
45. Perea, J. F. (2003). A brief history of race and the US-Mexican border: Tracing the trajectories of conquest. *UCLA L. Rev.*, 51, 283.
46. Cheng, T. L., & Goodman, E. (2015, January). Race, ethnicity, and socioeconomic status in research on child health. *Pediatrics* 135(1): e225-e237. Retrieved from <http://pediatrics.aappublications.org/content/135/1/e225>
47. Desmond, M. (2017, May 9). How Homeownership Became the Engine of American Inequality. *The New York Times Magazine*. Retrieved from <https://www.nytimes.com/2017/05/09/magazine/how-homeownership-became-the-engine-of-american-inequality.html>
48. *Dismantling the Pipeline: Addressing the Needs of Young Women and Girls of Color Involved in Intervening Public Systems*. (n.d.). Retrieved June 6, 2017, from <http://www.cssp.org/pages/body/WGOC-policy-oct2015-spreads.pdf>
49. *Fight for Our Girls* (n.d.). Retrieved June 6, 2017, from <http://www.cssp.org/reform/child-welfare/alliance/fight-for-our-girls-status-offenses.pdf>
50. Rothstein, R. (2017). *Color of Law: A Forgotten History of How Our Government Segregated America*. New York: Liveright Publishing Corporation.
51. Yi, SS, Kwon SC, Sacks R, Trinh-Shevrin C. (2016). Persistence and health-related consequences of the model minority stereotype for Asian Americans. *Ethnicity & Disease*, 26(1), 133-138. doi: 10.18865/ed.26.1.133
52. Ross, L., & Solinger, R. (2017). *Reproductive Justice: An Introduction*. Oakland, CA: University of California Press.
53. Non-Discrimination Laws [Map]. (2017, November 9). In *Movement Advancement Project*. Retrieved from http://www.lgbtmap.org/equality-maps/non_discrimination_laws
54. Human Rights Campaign (n.d.). Establishing an Allies/Safe Zone Program. Retrieved from <https://www.hrc.org/resources/establishing-an-allies-safe-zone-program>
55. *Implicit Bias*. (n.d.). Retrieved from <http://kirwaninstitute.osu.edu/wp-content/uploads/2014/03/2014-implicit-bias.pdf>
56. Swetlitz, I. (2017, February 23). Immigrants, fearing Trump's deportation policies, avoid doctor visits. *STAT*. Retrieved from https://www.statnews.com/2017/02/24/immigrants-doctors-medical-care/?_hsenc=p2ANqtz-8rySL6ZzbnxPZYquK8B32oCMC9tmg5IJ4VqlrN1em6cFIeACsl-E8Fq3w3iki_xZYPlinH1CrdYTn8uD7DBOTT0t7yQ&_hsmi=2
57. Okwerekwu, Jennifer Adaeze. (2017, March 6). Why I've learned to leave blank spots in some patients' medical records. *Stat*. Retrieved from <https://www.statnews.com>
58. Erney, R. (2017). *Healthy, Thriving Communities: Safe Spaces for Immigrant Children and Families*. Washington, DC: Center for the Study of Social Policy. Retrieved from <http://www.cssp.org/policy/2017/Safe-Spaces-Immigrant-Children-Families.pdf>
59. Schickedanz, A. and Coker, T.R., 2016. Surveillance and Screening for Social Determinants of Health—Where Do We Start and Where Are We Headed? *Current problems in pediatric and adolescent health care*, 46(5), pp.154-156