

Pharmacy QI Learning Collaborative: Pro CGM & ABPM

February 28, 2023

Care Transformation Collaborative of RI



Agenda

Торіс	Presenter/Facilitator	Timing
Welcome	Susanne Campbell	7:30-7:35
Practice Sharing	Miriam Hospital Ambulatory Clinic Medical Associates of RI Integra/RIPCPC Providence Community Health Center Coastal Medical Anchor Medical	7:35-8:05
Care Team Survey	Stephen Kogut	8:05-8:15
Diabetes Updated Standards	Kelley Sanzen	8:15-8:55
Next Steps	Kelley Sanzen	8:55-9:00



Standards of Care in Diabetes: An Update to the American Diabetes Association Pratice Guidelines - 2023

Kelley Sanzen, PharmD, PAHM, CDOE

Special thanks to Danielle D'Achino, URI College of Pharmacy candidate 2023, for assisting with these slides!

3/7/2023



Continuous Glucose Monitoring (CGM)

- Recommendation for offering the use of CGM in patients with type 2 diabetes on basal-only insulin therapy (once-daily, longacting insulin) in addition to people on all other types of insulin regimens
 - Medicare is currently considering coverage of CGM for this population
- Patients should be educated on the interfering substances that can negatively impact sensor accuracy

Table 7.4—Continuous glucose monitoring devices interfering substances				
Medication	Systems affected	Effect		
Acetaminophen >4 g/day Any dose	Dexcom G6 Medtronic Guardian	Higher sensor readings than actual glucose Higher sensor readings than actual glucose		
Alcohol	Medtronic Guardian	Sensor readings may be higher than actual glucose		
Ascorbic acid (vitamin C), >500 mg/day	FreeStyle Libre	Higher sensor readings than actual glucose		
Hydroxyurea	Dexcom G6, Medtronic Guardian	Higher sensor readings than actual glucose		
Mannitol	Senseonics Eversense	Sensor bias within therapeutic concentration ranges		
Tetracycline	Senseonics Eversense	Sensor bias within therapeutic concentration ranges		

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CKD and Risk Management

- New levels for initiation of SGLT2 inhibitors
 - Estimated GFR ≥ 20 mL/min/1.73 m2 and urinary albumin ≥ 200 mg/g
- SGLT2 inhibitors may also be effective in people with urinary albumin ≥ 200 mg/g
 - B level rated evidence at this time as the study reporting this has not yet been published
- Mineralocorticoid Receptor Antagonists (MRAs) recommended along with other medications for cardiovascular and kidney protection rather than as alternatives when other treatment have not been effective

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Cardiovascular Disease and Risk Management

- Treatment with high intensity statin therapy in individuals with diabetes and established atherosclerotic cardiovascular disease to target an LDL cholesterol reduction of ≥50% from baseline and an LDL cholesterol goal of ≤ 55 mg/dL
 - If goal is not achieved on max tolerated statin consider addition of ezetimibe or a PCSK9 inhibitor
- Use of sodium-glucose co-transporter 2 (SGLT2) inhibitors for patients with diabetes and established heart failure with preserved or reduced ejection fraction to improve symptoms, physical limitations, and quality of life
- Addition of finerenone recommended in treatment of patients with type 2 diabetes and CKD with albuminuria treated with maximum tolerated doses of ACEi or ARB

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Renal Outcome Trials

- CREDENCE
 - Canagliflozin vs Placebo
- DAPA-CKD
 - Dapagliflozin vs Placebo
- EMPA-KIDNEY
 - Empagliflozin vs Placebo

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Perkovic, Vlado, et al. Canagliflozin and Renal Outcomes in Type 2 Diabetes and Nephropathy. NEJM, 2019, doi:10.1056/nejmoa1811744. 🔰 @MarioFunesMD

Could dapagliflozin improve kidney and cardiovascular outcomes in patients with CKD?





Conclusion: Among patients with chronic kidney disease, the risk of any composite kidney or cardiovascular outcomes or death was significantly lower with dapagliflozin than with placebo.

Reference:Heerspink HJL *et al.* Dapagliflozin in Patients with Chronic Kidney Disease. N Engl J Med. 2020 Sep 24. DOI: 10.1056/NEJMoa2024816.



Visual abstract: Denisse Arellano, MD 🔰 @deniise_am

Is Empagliflozin Beneficial in Patients With Variable Chronic Kidney Disease and Diabetes Status? EMPA-KIDNEY Collaborative Group



	6609 patients randomized		Progressiv or CV o	ve CKD* death	Hospitalization for CHF or CV death	Hospitalization any cause (per 100 patient yrs)
	2-year follow up	Placebo	16.9	9%	4.6%	29.2
JL_	eGFR ≥ 20-45 ml/min/1.73 m ²	Empagliflozin	HR 0.72 (0 p< 0.	.64-0.82) 001	HR 0.84 (0.67-1.07) p=0.15	HR 0.86 (0.78-0.95) p= 0.003
	eGFR \ge 45-90 ml/min/1.73 m^2	n=3304	13.1	%	4.0%	24.8
and Urine Albumin to creatinine				*sustained	40% eGFR decline / eGFR <10	ml/min / ESKD
ratio of > 200 mg/g		ر م	or Results were consistent in patients with and without diabetes			
mpagliflozin in Patients with Chronic Kidney Conclusion: Among a wide range of patients with CKD who						

Empagliflozin in Patients with Chronic Kidney Disease: The EMPA-KIDNEY Collaborative Group. Herrington WG, Staplin N, Wanner C, et al. N Engl J Med. 2022 Nov 4. doi: 10.1056/NEJMoa2204233 **Conclusion:** Among a wide range of patients with CKD who were at risk for progression, empagliflozin therapy led to a lower risk of progression of CKD or death from cardiovascular causes than placebo.



R	enal	SGLT2 Inhibitor			
Outcome		CREDENCE	DAPA-CKD	EMPA-KIDNEY	
Τι	rials	N = 4401	N = 4304	N = 6609	
	Intervention	Canagliflozin vs. Placebo	Dapagliflozin vs. Placebo	Empagliflozin vs. Placebo	
		≥4 weeks stable on ACEi or ARB	≥4 weeks stable on ACEi or ARB	On ACEi or ARB	
	Patients	 T2D eGFR ≥30 to <90 mL/min/1.73m² UACR >300 to ≤5000 mg/g 	 T2D and non-diabetes eGFR ≥25 to ≤75 mL/min/1.73m² UACR ≥200 to ≤5000 mg/g 	 T2D and non-diabetes eGFR ≥20 to <45 mL/min/1.73m² or ≥45 to <90 mL/min/1.73m² and UACR ≥200 mg/g 	



	lenal	SGLT2 Inhibitor			
Outcome		CREDENCE	DAPA-CKD	EMPA-KIDNEY	
	Trials	N = 4401	N = 4304	N = 6609	
	Primary Endpoint	 Composite Doubling of serum creatinine ESKD Renal or CV death 	Composite • ≥50% sustained eGFR decline • ESKD • Renal or CV death	 Composite Kidney failure ≥40% sustained eGFR decline Renal death 	
	Secondary Endpoints	 CV death or hospitalized for heart failure (hHF) CV death, MI, or stroke hHF Renal composite CV death All-cause death Composite of CV death, MI, stroke, hHF, or hospitalization for UA 	 Renal composite CV death or hHF All-cause death 	 CV death or hHF All-cause hospitalizations All-cause death Kidney disease progression CV death CV death or ESKD 	



Renal	SGLT2 Inhibitor			
Trials	CREDENCE	DAPA-CKD	EMPA-KIDNEY	
Results	Primary Outcome:	Primary Outcome:	Primary Outcome:	
	 Placebo: 61 per 1,000 patient years Canagliflozin: 43 per 1,000 patient years HR = 0.70 (CI 0.59 to 0.82) 	 Placebo: 14.5% Dapagliflozin: 9.2% p<0.001 Kidney Outcome: 	 Placebo: 16.9% Empagliflozin: 13.1% HR: 0.72 (0.64-0.82) p<0.001 	
	Secondary Outcome:	• Placebo: 11.3%	Hospitalization for CHF or CV death:	
	 Renal-specific: HR = 0.66 (CI 0.53 to 0.81) CV: HR = 0.80 (CI 0.67 to 0.95) 	 Dapagliflozin: 6.6% p<0.001 	 Placebo:4.6% Empagliflozin: 4.0% HP: 0.84 (0.67, 1.07) 	
		CV Outcome:	• p=0.15	
		 Placebo: 6.4% Dapagliflozin: 4.6% p=0.009 	Hospitalization any cause (per 100 patient yrs):	
		Death from any cause:	Placebo: 29.2Empagliflozin: 24.8	
		 Placebo: 6.8% Dapagliflozin: 4.7% p=0.004 	 HR: 0.86 (0.78-0.95) p=0.003 	



Re Out	enal come	SGLT2 Inhibitor			
Tr	rials	CREDENCE	DAPA-CKD	EMPA-KIDNEY	
C	Conclusions	Patients with diabetes and kidney disease: Risk of kidney failure and CV events lower in Canagliflozin group than placebo	Patient with CKD: risk of composite kidney, CV outcomes, or death was significantly lower with dapagliflozin than with placebo	Patients with CKD: risk for progression, empagliflozin therapy led to a lower risk of progression of CKD or death from CV causes than placebo	

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ADVANCING INTEGRATED HEALTHCARE **Finerenone Trials** FIGARO-DKD FIDELIO-DKD Composite endpoint: time to Composite endpoint: time to CV **Clinical efficacy** onset of kidney failure*, sustained death, nonfatal MI, nonfatal stroke primary endpoint decrease of eGFR ≥ 40% from or hospitalization for HF baseline, or renal death Key secondary Same as primary endpoint in Same as primary endpoint in 6,3 FIDELIO-DKD FIGARO-DKD endpoints Composite: All-cause All-cause Change Onset of kidney failure Other secondary hospitalization in UACR 57% JeGFR mortality endpoints Renal death

 Exploratory endpoints
 eGFR slope
 New onset atrial fibrillation
 New onset heart failure
 Regression of albuminuria
 HRQoL

FIGURE 3: FIDELIO-DKD and FIGARO-DKD endpoints. ^aKidney failure defined as occurrence of ESKD (initiation of chronic dialysis for \geq 90 days or renal transplantation) or sustained eGFR <15 mL/min/1.73 m². HF: heart failure; HRQoL: health-related quality of life; MI: myocardial infarction.

FIDELIO-DKD

Does finerenone improve outcomes in CKD with type 2 diabetes?



Conclusion In patients with CKD and type 2 diabetes, treatment with finerenone resulted in lower risks of CKD progression and cardiovascular events than placebo

Bakris GL, Agarwal R, Anker SD, et al. Effect of finerenone on chronic kidney disease outcomes in type 2 diabetes. *N Engl J Med*. Published online October 23, 2020:NEJMoa2025845.

Visual abstract by Michelle Lim MBChB, MRCP

Figure 2. FIGARO-DKD

Does finerenone improve cardiovascular outcomes in type 2 diabetes and CKD?



Conclusion Among patients with type 2 diabetes and stage 2 to 4 CKD with moderately elevated albuminuria or stage 1 or 2 CKD with severely elevated albuminuria, finerenone therapy improved cardiovascular outcomes as compared with placebo. Pitt B, et al.; FIGARO-DKD Investigators. Cardiovascular events with finerenone in kidney disease and type 2 diabetes. *N Engl J Med* [published online ahead of print August 28, 2021]. doi: 10.1056/NEJMoa2110956 Visual abstract by Michelle Lim, MBChB, MRCP



Prevention or Delay of Type 2 Diabetes and Associated Comorbidities

 Pioglitazone may be considered in patients with a history of stroke and evidence of insulin resistance to lower the risk of stroke or myocardial infarction

Consider risk of weight gain, edema, fracture

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Obesity and Weight Management for Prevention and Treatment of Type 2 Diabetes

 Dual GLP-1 receptor agonists/glucose-dependent insulinotropic polypeptide (GIP) receptor agonist (tirzepatide) added as a glucose-lowering option with the potential for weight loss

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Pharmacologic Approaches to Glycemic Treatment

- A GLP-1 receptor agonist is **preferred** to insulin when possible
- Consider combination therapy with a GLP-1 receptor agonist when using insulin for greater efficacy, durability of treatment effect, weight and hypoglycemia benefit

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Medical Evaluation and Assessment of Comorbidities

- Managing patients with type 2 diabetes who have nonalcoholic fatty liver disease (NAFLD)
 - Treatment focus: managing hyperglycemia and obesity especially in cases of significant fibrosis
 - Pioglitazone and glucagon-like peptide 1 (GLP-1) receptor agonists have proven to be effective to treat steatohepatitis and may slow fibrosis progression

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What is chronic liver disease?







Progression to end-stage liver diseases with excessive fibrosis (cirrhosis) and/or neoplasia (HCC)

Albuquerque-Souza, E, Sahingur, SE. Periodontitis, chronic liver diseases, and the emerging oral-gut-liver axis. *Periodontol 2000*. 2022; 98: 125–141.

Stages of Chronic Liver Diseases

Liver homeostatic state

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Nonalcoholic Fatty Liver Disease (NAFLD)

- Is considered a "silent disease" with few or no symptoms
- Obesity, metabolic syndrome and diabetes increase likelihood of developing NAFLD
- Includes both nonalcoholic fatty liver (NAFL) and nonalcoholic steatohepatitis (NASH)
- NASH: presence of hepatic injury with inflammation with or without fibrosis
- NASH is classified into two types
 - Primary: Obesity and diabetes in absence of excessive alcohol intake
 - Secondary: Toxin or drug-induced
- Treatment
 - Weight loss to reduce fat, inflammation, and fibrosis of the liver
 - **Medication considerations**: use of Pioglitazone or GLP-1 agonist

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Dharmalingam M, Yamasandhi PG. Nonalcoholic Fatty Liver Disease and Type 2 Diabetes Mellitus. Indian J Endocrinol Metab. 2018 May-Jun;22(3):421-428. doi: 10.4103/ijem.IJEM_585_17. PMID: 30090738; PMCID: PMC6063173.



Diabetes and NAFLD

- Often coexist together
- Prevalence of NAFLD is ~60% among patients with type 2 diabetes
- Overweight/obesity and insulin resistance (IR) are strongly linked to NAFLD
- NAFLD increases microvascular complications of diabetes
 - Chronic Kidney Disease
 - Retinopathy
- Interventions for the management of NAFLD (lifestyle modifications, GLP-1s, SGLT2 inhibitors, thiazolidinediones (pioglitazone) etc.) indirectly improve IR and glycemia which explains why they are also used to treat T2DM

Dharmalingam M, Yamasandhi PG. Nonalcoholic Fatty Liver Disease and Type 2 Diabetes Mellitus. Indian J Endocrinol Metab. 2018 May-Jun;22(3):421-428. doi: 10.4103/ijem.IJEM_585_17. PMID: 30090738; PMCID: PMC6063173.

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What are you currently doing in the space of Chronic Liver Disease?

How are you identifying this population?

What challenges are you encountering?

How often are you using pioglitazone?





Next Steps

- Next Meeting: May 23rd, 2023, 7:30-9:00AM
- PDSA including patient engagement and care team engagement data, key findings and adjustments necessary - due May 9th, 2023





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Additional Resources

Resources can be found at

https://www.ctc-ri.org/otherprograms/pharmacy-qi-initiative

- Digital Remote Patient Monitoring Guide for Practices FSL2 and FSL14d
- ADCES ProCGM Playbook
- <u>https://www.freestyleprovider.abbott/us-en/freestyle-libre-14-day-system.html</u>
- Libre Billing Resources
- https://www.medtronicdiabetes.com/products/guardian-connect-continuous-glucosemonitoring-system?utm_source=bing&utm_campaign=CGM+-+BRAND+-+Core+-+Exact&utm_medium=cpc&ds_rl=1298299&msclkid=f9c6cae08cdf1a606c13a9e32c6e 7db6

Dexcom resources

- <u>Getting Started G6 Pro PowerPoint</u>
- <u>GEMCO Account Setup Instructions</u>
- G6 Pro Work Flow
- Dexcom G6 Pro User Guide
- Dexcom G6 Pro UnBlinded CGM Patient Handout
- Dexcom G6 Pro Patient Tracking Form
- Dexcom G6 Pro Daily Log Sheet
- Dexcom G6 Pro Blinded CGM Patient Handout
- 2022 CPT Billing CGM Reference