# AMGA Foundation National Diabetes Campaign Bonus Campaign Webinar January 11, 2017

### **TODAY'S WEBINAR**

- Together 2 Goal<sup>®</sup> Updates
  - Webinar Reminders
  - January 2017 Monthly Webinar
- Updates to ADA's Standards of Care
  - William Herman, MD, MPH, Co-Chair of ADA's Professional Practice Committee
- Q&A
  - Use Q&A or chat feature





### **WEBINAR REMINDERS**

- Webinar will be recorded today and available the week of January 16<sup>th</sup>
  - Together2Goal.org Website (Improve Patient Outcomes → Webinars)
  - Email distribution
- Participants are encouraged to ask questions using the "Chat" and "Q&A" functions on the right side of your screen





### **JANUARY 2017 MONTHLY WEBINAR**



**Behavioral Diabetes Institute** 

- Integrate Emotional and Behavioral Support plank
  - Dr. William Polonsky of the Behavioral Diabetes Institute
  - January 19 from 2-3 p.m.
     Eastern



### **TODAY'S SPEAKER**

### William Herman, MD, MPH

Co-Chair, Professional Practice Committee American Diabetes Association







# Standards of Medical Care In Diabetes

## William H. Herman, MD, MPH

Professor of Internal Medicine and Epidemiology University of Michigan Co-Chair, Professional Practice Committee American Diabetes Association



# Speaker Financial Disclosure Information

 Dr. Herman serves on Data Safety Monitoring Boards for Merck and Lexicon







# **The Process**

- The ADA Professional Practice Committee reviews and revises the Standards of Medical Care in Diabetes each year
- A Medline search is performed for human studies published in the prior calendar year
- Revisions are made to reflect new evidence, changes in the strength of the evidence, and for clarity



# **Evidence Grading System**

A	RCTs, meta-analyses, or compelling nonexperimental evidence
В	Cohort and case-control studies
С	Case series
Е	Expert opinion

American Diabetes Association Standards of Medical Care in Diabetes. Introduction. *Diabetes Care* 2017; 40(Suppl 1):S1-S2.



# **Today's Focus**

- Population health
- Lifestyle and psychosocial issues
- **Obesity management** •
- Management of hyperglycemia •



# **Population Health**



# **The Problem**

- 33 to 49% of diabetic patients do not meet targets for A1C, blood pressure, or lipid management
- Only 14% meet targets for A1C, BP, and lipid management, and for nonsmoking status
- The care delivery system is often fragmented, lacks clinical information capabilities, duplicates services, and is poorly designed
- Substantial system-level improvements are needed



# Components of the Chronic Care Model

- Clinical information systems
- Self-management support
- Decision support
- Delivery system design
- Health systems
- Community resources and policies

## www.BetterDiabetesCare.nih.gov



# Strategies for System-Level Improvement

- Support patient self-management
- Optimize provider and team behaviors
- Change the care system



# Support Patient Self-management

- Implement a systematic approach to support patient behavior change, including:
  - Healthy lifestyle: healthy eating, physical activity, tobacco cessation, weight management, effective coping
  - Disease self-management: managing medication, self-monitoring of blood glucose and blood pressure when clinically appropriate
  - Prevention of diabetes complications: selfmonitoring of foot health, active participation in screening for eye, kidney, and foot complications, immunizations



# Optimize Provider and Team Behaviors

- For patients who have not achieved target levels of control for glucose, blood pressure, or lipids, the care team should prioritize timely and appropriate intensification of therapy.
- Strategies include:
  - Explicit goal setting
  - Identifying and addressing language, numeracy, and/or cultural barriers to care
  - Integrating evidence-based guidelines
  - Incorporating care management teams



# Change the Care System

Most successful care systems make high-quality care an institutional priority. Changes include:

- Empowering and educating patients
- Basing care on evidence-based guidelines
- Implementing electronic health record tools
- Expanding the role of teams to implement more intensive disease management strategies
- Redesigning the care process

Continued...

American Diabetes Association Standards of Medical Care in Diabetes. Promoting health and reducing disparities in populations. *Diabetes Care* 2017; 40(Suppl 1):S6-S10.



# **Change the Care System**

- Removing financial barriers and reducing patient out-of-pocket costs
- Coordinated primary care, e.g., through a Patient-Centered Medical Home
- Changes to the reimbursement structure
- Identifying community resources and public policies that support healthy lifestyles

American Diabetes Association Standards of Medical Care in Diabetes. Promoting health and reducing disparities in populations. *Diabetes Care* 2017; 40(Suppl 1):S6-S10.



# Patient-Centered Collaborative Care

- To optimize patient health outcomes and health-related quality-of-life, employ a patientcentered communication style that:
  - uses active listening
  - elicits patient preferences and beliefs
  - assesses health literacy, numeracy, and potential barriers to care

American Diabetes Association Standards of Medical Care in Diabetes. Comprehensive medical evaluation and assessment of comorbidities. *Diabetes Care* 2017; 40(Suppl 1):S25-S32.



# Tailoring Treatment to Reduce Disparities

- Assess social context, including food insecurity, housing stability, and financial barriers, and apply that information to treatment decisions
- Refer patients to local community resources
- Patients should be provided with selfmanagement support from lay health coaches, navigators, or community health workers when available

American Diabetes Association Standards of Medical Care in Diabetes. Promoting health and reducing disparities in populations. *Diabetes Care* 2017; 40(Suppl 1):S6-S10.



## Lifestyle and Psychosocial Issues



# Diabetes Self-Management Education and Support

- All people with diabetes should participate in DSME and DSMS both at diagnosis and as needed thereafter (B)
- DSME/S should be patient-centered, respectful, and responsive to individual patient preferences, needs, and values, and should guide clinical decisions (A)
- Effective self-management, improved clinical outcomes, health status, and quality-of-life are key goals of DSME/S and should be measured and monitored as part of care (C)

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. *Diabetes Care* 2017; 40(Suppl 1):S33-S43.



# Nutrition

- An individualized MNT program is recommended for all people with diabetes (A)
- People with T1D and those with T2D who are using flexible insulin programs should be educated about carbohydrate counting (A)
- For patients using fixed-dose insulin programs, a consistent pattern of carbohydrate intake with respect to time and amount can result in improved glycemic control and reduced risk of hypoglycemia (B) Continued...

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. *Diabetes Care* 2017; 40(Suppl 1):S33-S43.



# Nutrition

- Emphasizing portion control and healthy food choices may be more helpful for people with T2D who are not taking insulin, who have limited health literacy or numeracy, and who are elderly and prone to hypoglycemia (B)
- Diabetes nutrition therapy can result in cost savings (B) and improved outcomes (A) and should be adequately reimbursed by insurance and other payers (E)



# **Physical Activity**

- Children with diabetes/prediabetes: at least 60 min/day of physical activity (C)
- Most adults with diabetes: at least 150 min/wk of moderate to vigorous intensity aerobic activity with no more than two consecutive days without activity (T1D (C), T2D (B))
- Adults with T1D (C) T2D (B) should perform resistance training two to three times/week
- Flexibility training and balance training are recommended two to three times/week for older adults with diabetes (C)
- All individuals, including those with diabetes, should reduce sedentary time by breaking up extended amounts of time (>30 min) spent sitting (B)



# **Psychosocial Issues**

- Consider assessing for symptoms of diabetes distress, depression, anxiety, disordered eating, and cognitive dysfunction using validated tools at the initial visit, at periodic intervals, and when there is a change in disease, treatment, or life circumstance. Including caregivers and family members in this assessment is recommended. (B)
- Consider screening older adults (aged <u>>65 years</u>) with diabetes for cognitive impairment and depression. (B)
- Screening and follow-up may include assessing attitudes about illness, expectations for medical management and outcomes, affect or mood, general and diabetes-related quality-of-life, available resources (financial, social, and emotional), and psychiatric history. (E)

American Diabetes Association Standards of Medical Care in Diabetes. Lifestyle Management. *Diabetes Care* 2017; 40(Suppl 1):S33-S43.



# When to Refer to a Mental Health Provider

- Positive screen for depressive symptoms, anxiety, cognitive impairment, or fear of hypoglycemia
- Suspicion of disordered eating
- Declining or impaired ability to perform diabetes self-care behaviors
- Before (and perhaps after) undergoing metabolic surgery



## **Obesity Management for the Treatment of Type 2 Diabetes**



## Recommendations: Obesity Management - Treatment of T2D

### Table 7.1—Treatment for overweight and obesity in type 2 diabetes

	BMI category (kg/m <sup>2</sup> )				
	23.0* or		27.5* or		
Treatment	25.0–26.9	27.0–29.9	30.0–34.9	35.0–39.9	≥40
Diet, physical activity, and behavioral therapy	+	+	+	+	+
Pharmacotherapy		+	+	+	+
Metabolic surgery			+	+	+

\*Cutoff points for Asian American individuals.

+Treatment may be indicated for selected motivated patients.

American Diabetes Association Standards of Medical Care in Diabetes. Obesity Management for the Treatment of Type 2 Diabetes. *Diabetes Care* 2017; 40(Suppl 1):S57-63.





### Recommendations

- Diet, physical activity, and behavioral therapy designed to achieve 5% weight loss should be prescribed for overweight and obese patients with type 2 diabetes ready to achieve weight loss.
- Interventions should be high intensity (≥16 sessions in 6 months) and offer long-term weight maintenance counseling.

American Diabetes Association Standards of Medical Care in Diabetes. Obesity Management for the Treatment of Type 2 Diabetes. *Diabetes Care* 2017; 40(Suppl 1):S57-63.



# Look AHEAD

- RCT that examined whether weight loss in overweight and obese individuals with type 2 diabetes reduces cardiovascular morbidity and mortality over 11 years (median 9.6 years)
- Randomized 5,145 overweight or obese individuals to:
  - Intensive lifestyle intervention
  - Diabetes support and education (control)



# Intensive Lifestyle Intervention participants had greater weight loss at every time point



The Look AHEAD Research Group. NEJM 2013;369:145



# Intensive Lifestyle Intervention participants had greater improvements in HbA1c



The Look AHEAD Research Group. NEJM 2013;369:145



# Intensive Lifestyle Intervention did not reduce cardiovascular morbidity and mortality





But... the Intensive Lifestyle Intervention had other positive effects:

- Required fewer glucose-, blood pressure-, and lipid-lowering medications
- Improvements in physical functioning, mobility, and quality-of-life
- Reductions in urinary incontinence, sleep apnea, and depression





# Pharmacotherapy

### Recommendations

- Weight loss medications may be effective as adjuncts to diet, physical activity, and behavioral counseling for selected patients with type 2 diabetes and BMI ≥27 kg/m<sup>2</sup>.
- If a patient's response to weight loss medications is <5% after 3 months or if there are safety or tolerability issues at any time, the medication should be discontinued and alternative medications or treatment approaches should be considered.

American Diabetes Association Standards of Medical Care in Diabetes. Obesity Management for the Treatment of Type 2 Diabetes. *Diabetes Care* 2017; 40(Suppl 1):S57-63.



### FDA-Approved Medications for the Long-Term Treatment of Obesity

		_	1-Year weight change status		Adver	se effects
Drug name	Adult dosing	- Average wholesale price (per month)	Average weight loss relative to placebo	% Patients with ≥5% loss of baseline weight	Common	Serious
Orlistat (Alli) (Xenical)	60 mg 120 mg t.i.d.	\$43-86 (60 mg) \$670	2.5 kg 3.4 kg	35-73%	Abdominal pain, fecal urgency, fat malabsorption	Liver failure and oxalate nephropathy
Lorcaserin (Belviq)	10 mg b.i.d.	\$263	3.2 kg	38-48%	Headache, fatigue	Serotonin syndrome, heart valve disorders (<2.4%)
Phentermine/ topiramate ER (Qsymia)	Maximum dose: 15 mg/92 mg q.d.	\$239	8.9 kg	45-70%	Paresthesia, xerostomia, constipation, headache	Topiramate is teratogenic (cleft lip/ palate)
Naltrexone/ bupropion (Contrave)	Maximum dose: 16 mg/180 mg b.i.d.	\$251	2.0-4.1 kg	36-57%	Nausea, constipation, headache	Depression, mania, contraindicated in seizure disorders
Liraglutide (Saxenda)	Maintenance dose: 3 mg s.c. q.d.	\$1,385	5.8-5.9 kg	51-73%	Nausea, vomiting, diarrhea, constipation, headache	Pancreatitis, acute renal failure, contraindicated with MCT or MEN2

American Diabetes Association Standards of Medical Care in Diabetes. Obesity Management for the Treatment of Type 2 Diabetes. *Diabetes Care* 2017; 40(Suppl 1):S57-63.



# Metabolic Surgery

- Metabolic surgery should be recommended to treat type 2 diabetes in appropriate surgical candidates with BMI ≥40 kg/m<sup>2</sup> (BMI ≥37.5 kg/m<sup>2</sup> in Asian Americans), regardless of the level of glycemic control or complexity of glucose-lowering regimens, and in adults with BMI 35.0-39.9 kg/m<sup>2</sup> (32.5-37.4 kg/m<sup>2</sup> in Asian Americans) when hyperglycemia is inadequately controlled despite lifestyle and optimal medical therapy. (A)
- Metabolic surgery should be considered for adults with type 2 diabetes and BMI 30.0-34.9 kg/m<sup>2</sup> (27.5-32.4 kg/m<sup>2</sup> in Asian Americans) if hyperglycemia is inadequately controlled despite optimal medical management with either oral or injectable medications (including insulin). (B)



# **Metabolic Surgery**

- Metabolic surgery should be performed in high-volume centers with multidisciplinary teams that understand and are experienced in the management of diabetes and gastrointestinal surgery. (C)
- Long-term lifestyle support and routine monitoring of micronutrient and nutritional status must be provided to patients after surgery. (C)
- People presenting for metabolic surgery should receive a comprehensive mental health assessment. (B) Surgery should be postponed in patients with histories of alcohol or substance abuse, significant depression, suicidal ideation, or other mental health conditions until those conditions have been fully addressed. (E)
- People who undergo metabolic surgery should be evaluated to assess the need for ongoing mental health services to help them adjust to medical and psychosocial changes after surgery. (C)

American Diabetes Association Standards of Medical Care in Diabetes. Obesity Management for the Treatment of Type 2 Diabetes. *Diabetes Care* 2017; 40(Suppl 1):S57-63.



### Metabolic Surgery: Baseline Characteristics of the STAMPEDE Population with Type 2 Diabetes

Parameter	Intensive Medical Therapy (N=40)	Gastric Bypass (N=48)	Sleeve Gastrectomy (N=49)
Age – yrs	50 ± 8	48 ± 8	48 ± 8
Female sex (%)	68	58	78
Caucasian race (%)	73	75	74
Body-mass index – (kg/m²)	36.4 ± 3.0	37.1 ± 3.4	36.1 ± 3.9
Body-mass index <35 kg/m² (%)	45	27	37
Duration of diabetes – yrs	8.8 ± 5.38	8.0 ± 5.36	8.3 ± 4.49
Insulin users (%)	43	44	43



### Mean Change in BMI by Treatment Group, STAMPEDE Study





PR Schauer. N Engl J Med 370:2002, 2014

### Mean Change in Glycated Hemoglobin by Treatment Group, STAMPEDE Study





PR Schauer. N Engl J Med 370:2002, 2014

### Polar Chart of Scores of Quality-of-Life at 3-years by Treatment Group, STAMPEDE Study





PR Schauer. N Engl J Med 370:2002, 2014

### Meta-analysis of Risks of Bariatric Surgery from Randomized Controlled Trials, 2002-2012

Maan (QEV/ CI)

Mortality ≤30 d	
Estimates, %	0.08 (0.01-0.24)
Study/arm/No. of patients	15/30/1803
Mortality >30 d	
Estimates, %	0.31 (0.01-0.75)
Study/arm/No. of patients	15/30/1703
Complication rates	
Estimates, %	17.00 (11.00-23.00)
Study/arm/No. of patients	16/30/1778
Reoperation rates	
Estimates, %	6.95 (3.27-12.04)
Study/arm/No. of patients	12/23/1322



## Updates to Management of Hyperglycemia



# **Glycemic Goals in Adults**

- Lowering A1C to <7% has been shown to reduce microvascular complications and, if implemented soon after the diagnosis of diabetes, is associated with long-term reduction in macrovascular disease (B)
- Consider more stringent goals (e.g., <6.5%) for select patients if achievable without significant hypoglycemia or other adverse events (C)
- Consider less stringent goals (e.g., <8%) for patients with a history of severe hypoglycemia, limited life expectancy, or other conditions that make <7% too difficult to attain (B)



### Approach to the Management of Hyperglycemia



American Diabetes Association Standards of Medical Care in Diabetes. Glycemic Targets. *Diabetes Care* 2017; 40(Suppl 1):S48-S56.



# Recommendations: Pharmacological Therapy for Type 1 Diabetes

- Most people with T1D should be treated with multiple daily injections (MDI) or continuous subcutaneous insulin infusion (CSII) (A)
- Individuals who have successfully used CSII should have continued access to CSII after they turn 65 years of age (E)
- Most individuals with T1D should use rapid-acting insulin analogues to reduce hypoglycemia risk (A)



# Pharmacologic Therapy for Type 2 Diabetes

- Metformin, if not contraindicated and if tolerated, is the preferred initial pharmacologic agent for the treatment of type 2 diabetes. (A)
- Long-term use of metformin may be associated with biochemical vitamin B12 deficiency, and periodic measurement of vitamin B12 levels should be considered in metformin-treated patients. (B)



# Pharmacologic Therapy for Type 2 Diabetes

- Consider initiating insulin therapy (with or without additional agents) in patients with newly diagnosed type 2 diabetes who are symptomatic and/or have A1c ≥10% (86 mmol/mol) and/or blood glucose levels ≥300 mg/dL (16.7 mmol/L). (E)
- If metformin monotherapy at maximum tolerated dose does not achieve or maintain the A1c target after 3 months, add a second oral agent, a glucagon-like peptide 1 receptor agonist, or basal insulin. (A)



### Antihyperglycemic Therapy in T2D

### Start with Monotherapy unless:

A1C is greater than or equal to 9%, consider Dual Therapy

A1C is greater than or equal to 10%, blood glucose is greater than or equal to 300 mg/dL, or patient is markedly symptomatic, consider Combination Injectable Therapy (See Figure 8.2).

Monotherapy	Metformin	Lifestyle Management
EFFICACY*	high	
HYPO RISK	low risk	
WEIGHT	neutral/loss	
SIDE EFFECTS	GI/lactic acidosis	
COSTS*	low	

If A1C target not achieved after approximately 3 months of monotherapy, proceed to 2-drug combination (order not meant to denote any specific preference - choice dependent on a variety of patient- & disease-specific factors):

### Dual Therapy Metformin +

### Lifestyle Management

	Sulfonylurea	Thiazolidinedione	DPP-4 inhibitor	SGLT2 inhibitor	GLP-1 receptor agonist	Insulin (basal)
EFFICACY"	high	high	intermediate	intermediate	high	highest
HYPO RISK	moderate risk	low risk	low risk	low risk	low risk	high risk
WEIGHT	gain	gain	neutral	loss	loss	gain
SIDE EFFECTS	hypoglycemia	edema, HF, fxs	rare	GU, dehydration, fxs	GI	hypoglycemia
COSTS*	low	low	high	high	high	high

If AIC target not achieved after approximately 3 months of dual therapy, proceed to 3-drug combination (order not meant to denote any specific preference - choice dependent on a variety of patient- & disease-specific factors):

### **Triple Therapy** Metformin + Lifestyle Management Sulfonylurea + Thiazolidinedione + **DPP-4** inhibitor + SGLT2 inhibitor + GLP-1 receptor agonist + Insulin (basal) + TZD SU SU SU SU TZD DPP-4-i DPP-4-DPP-4-i TZD TZD TZD or or 10 SGLT2-i SGLT2-i SGLT2-i DPP-4-i SGLT2-i SGLT2-i or 01 01 GLP-1-RA GLP-1-RA GLP-1-RA GLP-1-RA Insulin\* Insulin<sup>®</sup> 10 Insulin<sup>®</sup> Insulin® Insulin<sup>®</sup> If AIC target not achieved after approximately 3 months of triple therapy and patient (1) on oral combination, move to basal insulin or GLP-1 RA, (2) on GLP-1 RA, add basal insulin, or (3) on optimally titrated basal insulin, add GLP-1 RA or

mealtime insulin. Metformin therapy should be maintained, while other oral agents may be discontinued on an individual basis to avoid unnecessarily complex or costly regimens (i.e., adding a fourth antihyperglycemic agent).

Combination Injectable Therapy

(See Figure 8.2)

American Diabetes Association Standards of Medical Care in Diabetes. Pharmacologic Approaches to Glycemic Treatment. Diabetes Care 2017; 40(Suppl 1):S64-S74.



American Diabetes Association

# Pharmacologic Therapy for Type 2 Diabetes

 A patient-centered approach should be used to guide the choice of pharmacologic agents.
 Considerations include efficacy, hypoglycemia risk, impact on weight, potential side effects, cost, and patient preferences. (E)



# Pharmacologic Therapy for Type 2 Diabetes

 In patients with long-standing suboptimally controlled type 2 diabetes and established atherosclerotic cardiovascular disease, empagliflozin or liraglutide should be considered as they have been shown to reduce cardiovascular and all-cause mortality when added to standard care. Ongoing studies are investigating the cardiovascular benefits of other agents in these drug classes. (B)



The EMPA-REG Outcome Trial compared the impact of empagliflozin and placebo when added to standard care on cardiovascular death, nonfatal MI, and nonfatal stroke in patients with type 2 diabetes and established cardiovascular disease.



### Cumulative Incidence of Nonfatal MI, Nonfatal Stroke, or Cardiovascular Death by Treatment Group, EMPA-REG



B Zinman. N Engl J Med 373:2117, 2015



The LEADER Trial compared the impact of liraglutide and placebo when added to standard care on cardiovascular death, nonfatal MI, and nonfatal stroke in patients with type 2 diabetes at high cardiovascular risk.



## Cumulative incidence of nonfatal MI, nonfatal stroke, or cardiovascular death by treatment group, LEADER



SP Marso. N Engl J Med 2016. DOI: 10.1056/NEJMoa1603827



### The Costs of Noninsulin Therapies

Class	Compound(s)	Dosage strength/product (if applicable)	Median AWP (min, max)†	Maximum approved daily dose*
Biguanides	Metformin	500 mg (IR)	\$84 (\$5, \$94) \$108 (\$5, \$108)	2,000 mg
		1 000 mg (IR)	\$108 (\$5, \$108)	2,550 mg
		500 mg (FR)	200 (24, 207) \$00 (\$92 \$6 672)	2,000 mg
		750 mg (ER)	\$90 (\$02, \$0,072) \$72 (\$65 \$02)	2,000 mg
		1 000 mg (ER)	\$72 (\$05, \$52) \$1 028 (\$1 010 \$7 213)	2,000 mg
Sulfonyluroos (2nd Con)	• Chyburido	5 mg	\$1,020 (\$1,010, \$7,213)	2,000 mg
Sunonylureas (2nd Gen)	• Glybunde	6 mg (micronized)	\$50 (\$48, \$71)	12 mg (micronized)
	<ul> <li>Glipizide</li> </ul>	10 mg (IR)	\$74 (\$67, \$97)	40 mg (IR)
		10 mg (XL)	\$97	20 mg (XL)
	<ul> <li>Glimepiride</li> </ul>	4 mg	\$74 (\$71, \$198)	8 mg
Meglitinides (glinides)	<ul> <li>Repaglinide</li> </ul>	2 mg	\$799 (\$163, \$878)	16 mg
	<ul> <li>Nateglinide</li> </ul>	120 mg	\$156	360 mg
TZDs	<ul> <li>Pioglitazone</li> </ul>	45 mg	\$349 (\$348, \$349)	45 mg
	<ul> <li>Rosiglitazone</li> </ul>	4 mg	\$355	8 mg
$\alpha$ -Glucosidase inhibitors	<ul> <li>Acarbose</li> </ul>	100 mg	\$104 (\$104, 105)	300 mg
	<ul> <li>Miglitol</li> </ul>	100 mg	\$241	300 mg
DPP-4 inhibitors	<ul> <li>Sitagliptin</li> </ul>	100 mg	\$436	100 mg
	<ul> <li>Saxagliptin</li> </ul>	5 mg	\$436	5 mg
	Linagliptin	5 mg	\$428	5 mg
	Alogliptin	25 mg	\$436	25 mg
Bile acid sequestrant	<ul> <li>Colesevelam</li> </ul>	625 mg tabs	\$679	3.75 g
	<b>D</b>	1.875 g suspension	\$1,357	3.75 g
Dopamine-2 agonists	Bromocriptine	0.8 mg	\$719	4.8 mg
SGLT2 inhibitors	Canagliflozin	300 mg	\$470	300 mg
	Dapaglifiozin     Empaglifiozin	10 mg	\$470 \$470	10 mg
CLP 1 receptor agonists	Empaginiozin     Evopatido	25 mg	\$470	20 mg
GLP-1 receptor agonists	• Exenatide • Exenatide	2 mg powder for suspension or pen	\$692	20 μg 2 mg**
	(extended-release)	18 mg/2 ml non	¢021	1.9 mg
		50 mg pen	\$631 \$527	1.8 mg**
	Dulaglutide	1.5/0.5 mL pen	\$690	1.5 mg**
Amylin mimetics	Promlintide	120 ug pen	\$2.124	120 ug/injectiontt

ER and XL, extended release; IR, immediate release; TZD, thiazolidinedione.  $\pm$ Calculated for 30 day supply (AWP unit price  $\times$  number of doses required to provide maximum approved daily dose  $\times$  30 days); median AWP listed alone when only one product and/or price.  $\pm$ Utilized to calculate median AWP (min, max); generic prices used, if available commercially.  $\pm$ Administered once weekly.  $\pm$ AWP calculated based on 120 µg three times daily.



# Pharmacologic Therapy for Type 2 Diabetes

- For patients with type 2 diabetes who are not achieving glycemic goals, insulin therapy should not be delayed. (B)
- While there is evidence for reduced risk of hypoglycemia with newer, longer-acting basal insulin analogs, people with type 2 diabetes without histories of hypoglycemia may use NPH insulin safely and at a much lower cost.



### **Combination Injectable Therapy for T2D**





### The Costs of Insulin

Table 8.3—Median cost of insulins in the U.S. calculated as average wholesale price per 1,000 units of specified dosage form/product (48)

			Median AWP package
Insulins	Compounds	Dosage form/product	price (min, max)*
Rapid-acting analogs			
	• Lispro	U-100 vial	\$306
		U-100 3 mL cartridges	\$306 (\$306, \$379)
		U-100 prefilled pen; U-200 prefilled pen	\$394
	Aspart	U-100 vial	\$306
		U-100 3 mL cartridges	\$380
		U-100 prefilled pen	\$395
	• Glulisine	U-100 vial	\$283
		U-100 prefilled pen	\$365
	<ul> <li>Inhaled insulin</li> </ul>	Inhalation cartridges	\$557 (\$453, \$754)
Short-acting			
	<ul> <li>Human Regular</li> </ul>	U-100 vial	\$165
Intermediate-acting			
	Human NPH	U-100 vial	\$165
		U-100 prefilled pen	\$350
Concentrated Human Regular insulin			
	• U-500 Human Regular insulin	U-500 vial	\$165
		U-500 prefilled pen	\$213
Basal analogs			
	• Glargine	U-100 vial; U-100 prefilled pen; U-300 prefilled pen	\$298
	Detemir	U-100 vial; U-100 prefilled pen	\$323
	• Degludec	U-100 prefilled pen; U-200 prefilled pen	\$355
Premixed products			
	<ul> <li>NPH/Regular 70/30</li> </ul>	U-100 vial	\$165
		U-100 prefilled pen	\$350
	• Lispro 50/50	U-100 vial	\$317
		U-100 prefilled pen	\$394
	• Lispro 75/25	U-100 vial	\$317
		U-100 prefilled pen	\$394
	Aspart 70/30	U-100 vial	\$318
		U-100 prefilled pen	\$395

AWP listed alone when only one product and/or price.



# **Questions?**

