Diabetes Education SERVICES 25 years growth, connection, inspiration

Back to the Basics and Beyond

Winchester, VA

Beverly Thomassian, RN, MPH, BC-ADM, CDCES
Pronouns: She, her and hers
Founder - www.DiabetesEd.net

Speakers & Agenda

SPEAKERS:
Beverly Thomassian, RN, MPH, CDE, BC-ADM, President of Diabetes Education Services

Schedule

08:00 to 9:45 am	ADA Standards of Care Dissected
09:45 to 10:05 am	Break
10:15am to 11:45 pm	Impact of Standards on Clinical Practice
11:45am to 1:00pm	Lunch
1:00 pm – 2:00 pm	Medications to address hyperglycemia and renal disease.
2:00pm – 2:15pm	Break
2:15 pm – 3:30 pm	Effectively addressing Diabetes Distress and Using the ReVive 5 Approach to Untangle CGM Data

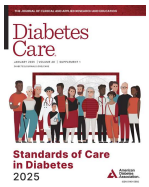
Coach Bev has no Conflict of Interest

- She's not on any speaker's bureau
- Does not invest or have any financial relationships with diabetes related companies.
- Gathers information from reading package inserts, research and articles
- The ADA Standards of Medical Care is main resource for course content

Standards of Care Update - Back to the Basics and Beyond

Objectives:

- Review the changes & updates to the annual ADA *Standards of Medical Care in Diabetes.*
- Identify the key elements of the standards that improve clinical care for people with diabetes.
- Review and discuss appropriate use of the latest medications that address hyperglycemia and cardiorenal health.
- Describe how diabetes distress affects self-management.
- Share practical approaches to assess and address diabetes distress in clinical care.
- Describe how to assess CGM reports and provide collaborative care.



17. Diabetes Advocacy

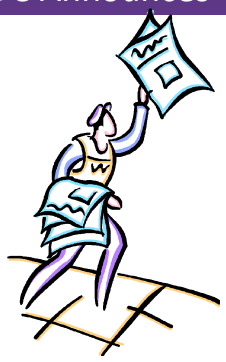
- People living with diabetes deserve to be free from the burden of discrimination.
- We need to all be a part of advocating to ensure a healthy and productive life for people living with diabetes.
- Decrease barriers to diabetes self-management.

Diabetes Care needs to meet outlined standards in all settings.

- In school setting
- Young children in childcare
- For Drivers
- In work settings
- In Detention Facilities
- Insulin Access & Affordability

17. Diabetes Advocacy: Standards of Care in Diabetes—2025
American Diabetes Association Professional Practice Committee

CDC Announces



35% of Americans will have Diabetes by 2050

Boyle, Thompson, Barker, Williamson
2010, Oct 22:8(1)29
www.pophealthmetrics.com

Poll Question 1

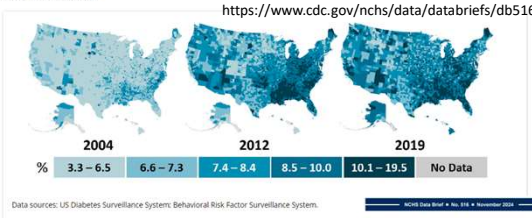
- What percent of total people in the U.S. are living with undiagnosed and diagnosed type 2 diabetes?
- A. About 30%
- B. 11.3%
- C. 16.8%
- D. 25.6%

Type 2 Diabetes in America 2025

- 16.8% with Diabetes
  - 11% don't know they have it
- 38% with Prediabetes – 97 million adults

Figure 3. Age-adjusted, county-level prevalence of diagnosed diabetes among adults aged 20 years or older, United States, 2004, 2012, and 2019

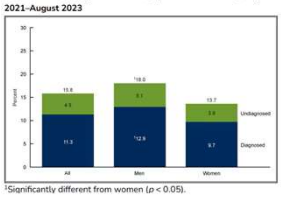
https://www.cdc.gov/nchs/data/databriefs/db516.pdf



Centers for Disease Control and Prevention. National Diabetes Stats Report https://www.cdc.gov/diabetes/data/statistics-report/index.html Accessed 1/23

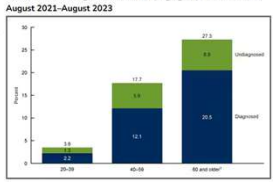
National Center for Health Statistics CDC | Data Brief No. 516, November 2024

Figure 1. Prevalence of total, diagnosed, and undiagnosed diabetes in adults age 20 and older, by sex: United States, August 2021–August 2023



[1]Significantly different from women ($p < 0.05$).

Figure 2. Prevalence of total, diagnosed, and undiagnosed diabetes in adults age 20 and older, by age group: United States, August 2021–August 2023



https://www.cdc.gov/nchs/products/databriefs/db516.htm

Figure 3. Prevalence of total, diagnosed, and undiagnosed diabetes in adults age 20 and older, by weight status: United States, August 2021–August 2023

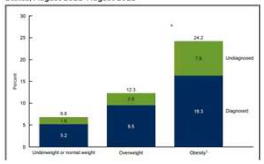
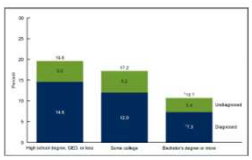


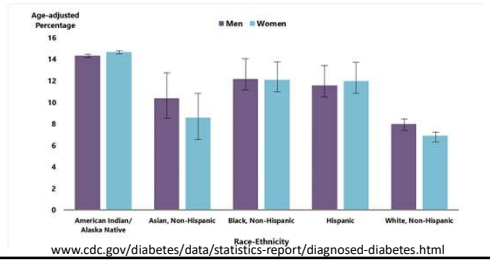
Figure 4. Prevalence of total, diagnosed, and undiagnosed diabetes in adults age 20 and older, by educational attainment: United States, August 2021–August 2023



Diabetes Prevalence by Ethnic Group

- For adults, diabetes prevalence highest among:
  - American Indians and Alaska Natives (14.5%),
  - Non-Hispanic Blacks (12.1%),
  - People of Hispanic origin (11.8%),
  - Non-Hispanic Asians (9.5%)

Figure 2. Age-adjusted estimated prevalence of diagnosed diabetes by race/ethnicity group and sex for adults aged 18 years or older, United States, 2018–2019



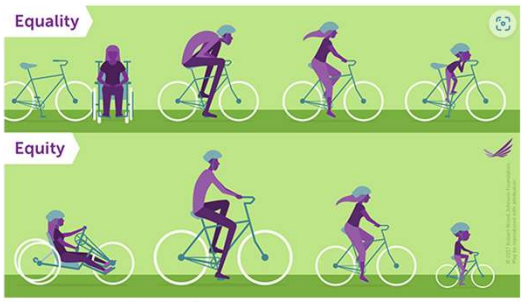
www.cdc.gov/diabetes/data/statistics-report/diagnosed-diabetes.html

Improving Care - Population Health

- "Health outcomes of a group of individuals
  - including the distribution of health outcomes within the group"
- These outcomes can be measured in terms of health outcome:
  - mortality, morbidity, health, and functional status
  - disease burden
    - (incidence and prevalence)
  - behavioral and metabolic factors
    - (exercise, diet, A1C, etc.)

ADA Standards 2025

Equality vs Equity



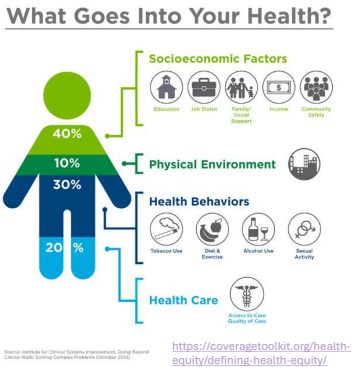
© 2017 Robert Wood Johnson Foundation

Design and deliver diabetes care with goal of **health equity** across all populations.

https://coveragetoolkit.org/health-equity/defining-health-equity/

Address Barriers to Self Management

- **Barriers exist** within health system, payer, health care professional & individual.
- **Address barriers** through innovation, including community health workers, telehealth, other digital health solutions.
- **Consider social determinants of health** in the target population when designing care.



https://coveragetoolkit.org/health-equity/defining-health-equity/

Social Determinants of Health

- SDOH are defined as the economic, environmental, political, and social conditions in which people live and are responsible for a major part of health inequality worldwide.

Greater exposure to adverse SDOH over the life course results in poor health. Use quality data to identify inequities & take action.

Tailoring Treatment for Social Context

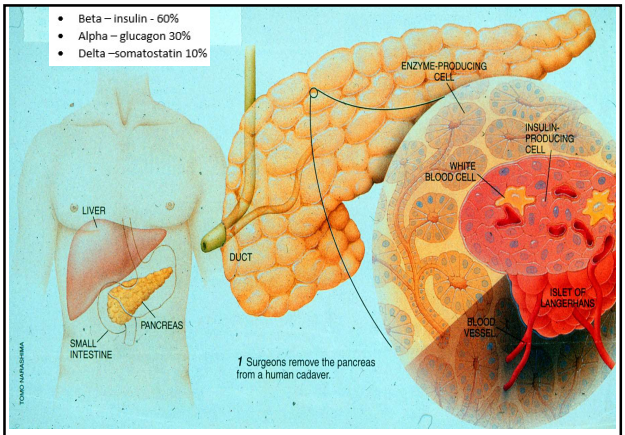
- "Social determinants of health (SDOH)—*often out of direct control of the individual* and potentially representing lifelong risk—contribute to health care and psychosocial outcomes and must be addressed to improve all health outcomes"

The ADA recognizes this relationship and is taking action.

Status of Diabetes Care

- In 2015–2018, U.S. community-dwelling adults with diabetes achieved:
  - A1C <7% by 50.5%
    - 75.4% achieved A1C <8%.
  - BP target of <130/80 achieved by 47.7%
    - 70.4% achieved blood pressure <140/90 mmHg.
  - Lipid control (non-HDL cholesterol) <130 mg/dL, achieved by 55.7%
- 22.2% met targets for all three risk factors
- Many not receiving adequate lifestyle or pharmacotherapy.

Now, let's get to the Nitty Gritty



Hormones Effect on Glucose

Hormone	Effect
Glucagon (pancreas)	↑
Stress hormones (kidney)	↑
Epinephrine (kidney)	↑
Insulin (pancreas)	↓
Amylin (pancreas)	↓
Gut hormones - incretins (GLP-1) released by L cells of intestinal mucosa, beta cell has receptors)	↓

Pre Diabetes & Type 2- Screening Guidelines (ADA 2025 Clinical Practice Guidelines)

1. Start screening all people at age 35.
2. Screen at any age if BMI ≥ 25 (Asians BMI ≥ 23) plus one or > additional **risk factor**:

- First-degree relative w/ diabetes
- Member of a high-risk ethnic population
- Habitual physical inactivity
- History of heart disease
- Check more frequently if taking high risk meds; antiretrovirals, 2nd generation antipsychotics or steroids, thiazide diuretics, statins
- History of pancreatitis, prediabetes, GDM, periodontitis

Diabetes 2 - Who is at Risk?

(ADA 2024 Clinical Practice Guidelines)

Screen using A1C, Fasting Blood Glucose or OGTT.

Repeat screening at least every 3 years if negative.

*If prediabetes or on high risk meds, recheck yearly

Risk factors cont'd

- HTN - BP > 130/80
- HDL < 35 or triglycerides > 250
- History of Gestational Diabetes Mellitus
- Polycystic ovary syndrome (PCOS)
- Other conditions associated w/ insulin resistance:
  - Elevated BMI, acanthosis nigricans (AN)

Diabetes Screening Guidelines

(ADA 2025 Clinical Practice Guidelines – Cheat Sheet)

RECOMMENDATIONS FOR DIAGNOSIS AND CLASSIFICATION OF DIABETES – 2025

CRITERIA FOR SCREENING FOR DIABETES AND PREDIABETES IN ASYMPTOMATIC ADULTS – TABLE 1

DIABETES TYPE	RISK FACTORS and FREQUENCY OF SCREENING and TESTING FOR DIABETES
Type 1	Screen those at risk for presymptomatic type 1 diabetes, by testing autoantibodies to insulin, GAD, islet antigen 2 or ZnT8. Also test antibodies for those with type 1 phenotypic risk (younger age, weight loss, ketoacidosis , etc.)

1. Test all adults starting at age **35** for prediabetes and diabetes using Fasting Plasma Glucose, A1C or OGTT.
2. Perform risk-based screening if BMI ≥ 25 or BMI ≥ 23 in Asian Americans 10yrs+ with 1 or more risk factors:
   - History of cardiovascular disease
   - First or second degree relative with diabetes
   - High risk ethnicity or ancestry
   - Other conditions associated with insulin resistance (PCOS, Acanthosis Nigricans, Steatosis)
   - Physical inactivity
   - HDL ≤ 35 mg/dl or triglyceride ≥ 250 mg/dl
   - Hypertension ≥ $^{130}/_{80}$ or on therapy for HTN
3. *If results normal, repeat test* at a minimum of 3-year intervals or more frequently based on risk status.
4. **Test Yearly if A1C ≥ 5.7%** or Impaired Fasting Glucose or History of GDM (test at least every 1- 3 years)

Closely monitor high-risk groups (before taking 2nd generation antipsychotics, steroids, thiazide diuretics, statins, HIV meds *and* after initiating therapy) with history of pancreatitis, or periodontal disease.

DiabetesEd.net Cheat Sheets

Poll Question 2

- Which of the following level is considered pre-diabetes range?

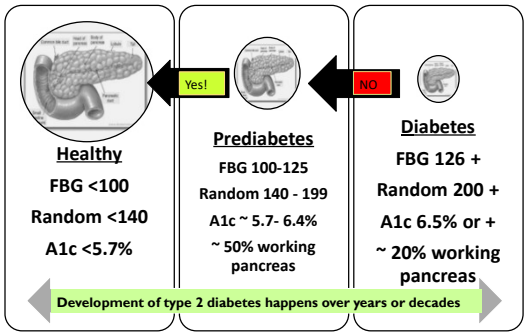
a. Fasting BG of 62

b. A1c of 5.9 %

c. After meal BG of 137

d. A1c of 7.1 %

Natural History of Diabetes



PreDiabetes is FREAKING ME OUT

- 96 million people in US
- 80% don't know they have it
- In 3-5 years, about 30% of predm will get diabetes
- Associated with higher rates of heart attack, stroke, neuropathy and vessel disease

Do I look like I am freaking out?

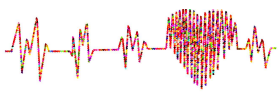
3. Prevention or Delay of Diabetes and Associated Comorbidities: Standards of Care in Diabetes—2025

Poll Question 3

- What best describes prediabetes in the U.S.?
  a. Prediabetes affects 18-20% of people above the age of 20.
  b. The prevalence of prediabetes and diabetes are almost equal.
  c. Most people with BMI of 30 or greater have prediabetes.
  d. Prediabetes is associated with increased risk of CV disease

3. Detecting PreDiabetes Matters

- Given the cost-effectiveness of lifestyle behavior modification programs for diabetes prevention:
  - Offer diabetes prevention programs to adults at high risk of type 2 diabetes
  - Prescribe effective eating patterns
  - Address inconsistencies in access – leverage technology
- Screening guidelines for people with Type 1



3. Prevention or Delay of Diabetes and Associated Comorbidities: Standards of Care in Diabetes—2025

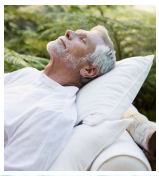
3. Prevent or Delay Diabetes for those with Prediabetes

- Prediabetes defined as:
  - A1c 5.7 – 6.4% or fasting BG 100 -125mg/dl
- Action:
  - Screen yearly for diabetes
  - For adults with BMI 23/25
    - Refer to DPP approved programs
    - Includes intensive behavioral lifestyle interventions with 7% wt reduction goal + 150 min exercise week
    - Provide in person or certified assisted programs

American Diabetes Association.

3. Prevention or Delay of Diabetes and Associated Comorbidities: Standards of Care in Diabetes—2025

Get About 7 Hours of Quality Sleep to Prevent Diabetes



- Poor sleep quality was associated with a 40–84% increased risk of developing type 2 diabetes in a meta-analysis.
- Chronotype preference has been linked with many chronic diseases, including type 2 diabetes.
  - For those with a preference for evenings (i.e., going to bed late and getting up late)
    - 2.5-fold higher odds ratio for type 2 diabetes than for those with a preference for mornings (i.e., going to bed early and getting up early),
    - Independent of sleep duration and sleep sufficiency

3. Prevention or Delay of Diabetes and Associated Comorbidities: Standards of Care in Diabetes—2025

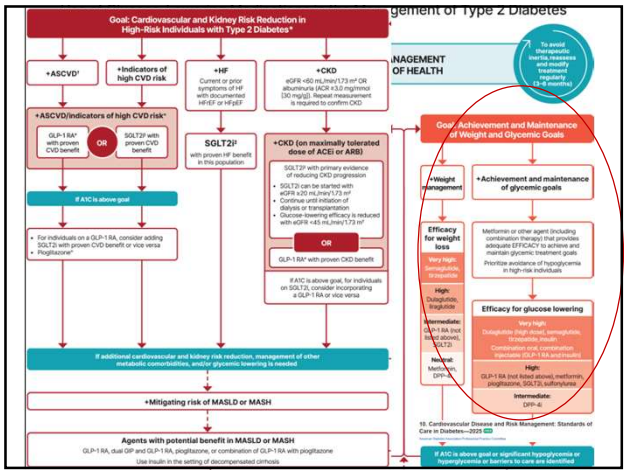
The composition of the gut microbiome may also affect the likelihood of developing type 2 diabetes.

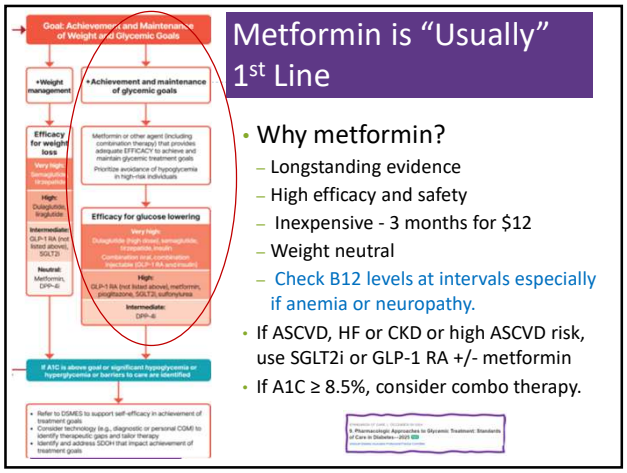
3. Person-Centered Care Goals

- Use more intensive approach for high-risk individuals:
  - BMI of 35+
  - If A1C is ~6.0 or FPG is 110
  - History of GDM
- No FDA approved med for prevention (off label)
- Consider Metformin Therapy for Prediabetes
  - Monitor B12 level (esp with neuropathy or anemia)

3. Prevention or Delay of Diabetes and Associated Comorbidities: Standards of Care in Diabetes—2025

- CV Risk Mitigation important.
- Statin can increase BG, stop if notice elevation
- Consider low dose pioglitazone (Actos) if history of stroke.





Metformin is "Usually" 1st Line

- Why metformin?
  - Longstanding evidence
  - High efficacy and safety
  - Inexpensive - 3 months for $12
  - Weight neutral
  - Check B12 levels at intervals especially if anemia or neuropathy.
- If ASCVD, HF or CKD or high ASCVD risk, use SGLT2i or GLP-1 RA +/- metformin
- If A1C ≥ 8.5%, consider combo therapy.

Common Oral Diabetes Meds

Diabetes Education Services

Download Success! Get Our Free CDCES Coach App

Class/Main Action	Name(s)	Daily Dose Range	Considerations
Biguanides • Decreases hepatic glucose output • First line med at diagnosis of type 2	metformin (Glucophage) Riomet (liquid metformin)	500 - 2550 mg (usually BID w/ meal) 500 - 2550 mg 500mg/5mL	**Side effects:** nausea, bloating, diarrhea, B12 deficiency. To minimize GI Side effects, use XR and take w/ meals. **Obtain GFR before starting.** • If GFR <30, do not use. • If GFR <45, don't start Meformin • If pt on Metformin and GFR falls to 30-45, eval risk vs. benefit; consider decreasing dose. **For dye study,** if GFR <60, liver disease, alcoholism or heart failure, restart metformin after 48 hours if renal function stable. **Benefits:** lowers cholesterol, no hypo or weight gain, cheap. Approved for pediatrics, 10 yrs + Lowers A1c 1.0%-2.0%.
	Extended Release-XR (Glucophage XR) (Glumetza) (Fortamet)	(1x daily w/dinner) 500 – 2000 mg 500 – 2000 mg 500 – 2500 mg	

Biguanide derived from:
Goat's Rue *Galega officinalis*,
French Lilac
Does NOT harm kidneys
$10 for 3-month supply from
Walmart & other pharmacies

Indications for Insulin Sensitizers
Rosiglitazone, Pioglitazone (Actos)

- **Action**: decrease insulin resistance by making muscle and adipose cells more sensitive to insulin. Decrease free fatty acids
- **Names**:
  - pioglitazone (Actos) – bladder cancer warning
    - Dosing: 15-45 mg daily
    - Consider adding low dose if history of stroke or have steatosis
  - rosiglitazone Dosing: 4-8 mg daily

Class/Main Action	Name(s)	Daily Dose Range	Considerations
Thiazolidinediones "TZDs" • Increases insulin sensitivity	pioglitazone (Actos) rosiglitazone	15 – 45 mg daily 4 – 8 mg daily	Black Box Warning: TZDs may cause or worsen CHF. Monitor for edema and weight gain. Increased peripheral fracture risk. Actos may increase risk of bladder cancer. Lowers A1c 0.5% – 1.0%

- **Efficacy/ Considerations**
  - Reduce A1C ~0.5-1.0%
  - 6 weeks for maximum effect
  - Actos $5 a month, Avandia $300 a month
  - Can cause fluid retention, not indicated w/ CHF

Poll question 4

- JR is started on Metformin 500mg BID. Which of the following is true?

a. Hold metformin if blood glucose below 90 mg/dl.
b. Evaluate B12 levels before starting medication.
c. Metformin is considered weight neutral
d. Metformin can cause kidney damage, so increase fluid intake

Medication Taking Behaviors

- Adequate medication taking is defined as 80%
- 23% of time, if A1c, B/P, lipids above target - due to med taking behavior
- Assess for barriers
- If taking meds 80% of time and goals not met, consider medication intensification

Barriers include:
Forgetting to fill Rx, forgetting to take, fear, depression, health beliefs, med complexity, cost, knowledge gap, system factors, etc.

Work on targeted approach for specific barrier

Diabetes is Complex

- Goal – achieve well being and negotiated outcomes
- Psychological factors:
  - Environmental
  - Social
  - Behavioral
  - Emotional
- Keep it person centered while integrating care into daily life
  - Consider the individual

Type 1 ~ Immune Mediated 5-10% of Diabetes

ADCES In Practice - March 2024
Recent Advances in Type 1 Diabetes: Teplizumab (Tzeild™)
Karen S. Fiano, PHARMD, BCACP, Devada Singh-Franco, PHARMD, CDCES, Young M. Kwon, BS, PHD

1.5 Million people have type 1 in U.S.

Prevalence increasing:

2001 – 1.48 per 1000 youths diagnosed with diabetes

2017 - 2.15 per 1000 youths diagnosed with diabetes

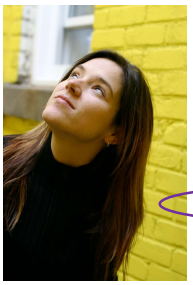
Incidence & Prevalence increasing

Highest incidence in Finland or Northern Europe.

Type 1 – 10% of all Diabetes

- Auto-immune pancreatic beta cells destruction
- Most commonly expressed at age 10 - 14
- Insulin sensitive (require 0.5 - 1.0 units/kg/day)
- Expression due to a combo of genes and environment:
  - Autoimmunity tends to run in families
  - Exposure to virus or other environmental factors
- Signs can include:
  - Increased thirst and hunger
  - Frequent urination or new bed-wetting at hs
  - Unintended weight loss
  - Fatigue and irritability

Poll 6. What Kind of Diabetes?



AJ, a 29 year old female admitted to the ICU with a blood glucose of 476 mg/dl and a pH of 7.1. (normal pH 7.35-7.45). Lost 13 pounds, BMI 23. What further testing is needed to determine if person has type 1 or type 2 diabetes?

A. Glutamic acid decarboxylase
B. Beta cells auto antibodies
C. Langerhan's antibody
D. Endogenous insulin titer

Antibody Testing for Type 1

- Glutamic acid decarboxylase (GAD) primary antibody measured
- If negative, test islet tyrosine phosphatase 2 (IA-2) and/or zinc transporter 8 (ZnT8) where these tests are available.
- In individuals who have not been treated with insulin, antibodies against insulin may also be useful.
- 5–10% of people with type 1 diabetes do not have antibodies.
  - In those diagnosed at <35 years of age who have no clinical features of type 2 diabetes or monogenic diabetes, a negative result does not change the diagnosis of type 1 diabetes,
- Rate of type 1 progression depends on:
  - age at first detection of autoantibody,
  - number of autoantibodies,
  - autoantibody specificity, and autoantibody titer.
  - Glucose and A1C levels may rise well before the clinical onset of diabetes

2. Diagnosis and Classification of Diabetes: Standards of Care in Diabetes—2025

Recommendations for Diagnosis and Classification of Diabetes – 2025

Criteria for Screening for Diabetes and PreDiabetes in Asymptomatic Adults – Table 1

Diabetes Type	Risk factors and frequency of screening and testing for diabetes
Type 1	Screen those at risk for presymptomatic type 1 diabetes, by testing autoantibodies to insulin, GAD, islet antigen 2 or ZnT8. Also test antibodies for those with type 1 phenotypic risk (younger age, weight loss, ketoacidosis , etc.)

	Stage 1	Stage 2	Stage 3
Characteristics	• Autoimmunity • Normoglycemia • Presymptomatic	• Autoimmunity • Dysglycemia • Presymptomatic	• Autoimmunity • Overt hyperglycemia • Symptomatic
Diagnostic criteria	• Multiple islet autoantibodies - GAD, glutamic acid decarboxylase (primary) - islet antigen 2, or - Zinc transporter 8 (ZnT8)	• Islet autoantibodies Dysglycemia: Elevated IFG and/or IGT • FPG 100–125 mg/dL • 2-h PG 140–199 mg/dL • A1C 5.7–6.4% or ≥10% increase in A1C	• Autoantibodies may disappear over time (5-10% may not express antibodies) • Diabetes diagnosed by standard criteria

2. Diagnosis and Classification of Diabetes: Standards of Care in Diabetes—2025

Pharmacologic Intervention to Delay Symptomatic Type 1 (in Stage 2)

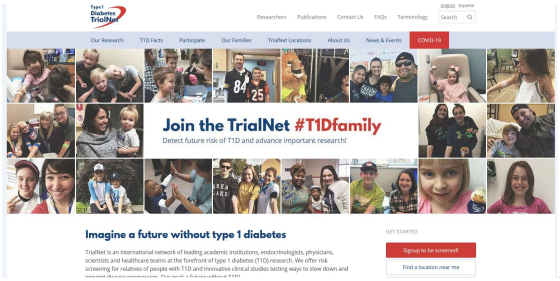
- Teplizumab-Tzield (CD3-monoclonal antibody)
- 14-day infusion can delay the onset of symptomatic type 1 diabetes (stage 3)
- An option in selected individuals aged ≥8 years with stage 2 type 1 diabetes.
- In a single trial, 44 individuals received 14-day course of teplizumab vs 32 placebo.
- The median time to stage 3 diagnosis of type 1
  - 48.4 months in tep group
  - 24.4 months placebo
- Cost: $193,000
- Provention Bio has financial assist programs.

126. Herold KC, Bundy BN, Long SA, et al.; Type 1 Diabetes TrialNet Study Group. An anti-CD3 antibody, teplizumab, in relatives at risk for type 1 diabetes. *N Engl J Med* 2019;381:603–613

3. Prevention or Delay of Diabetes and Associated Comorbidities: *Standards of Care in Diabetes—2024*

Type 1 (stage 2) Delayed with Teplizumab by 2 years www.DiabetesTrialNet.org

- **How to get families linked to screening?**



Determine if Type 1 - Use AABBCC Approach

- **A**ge
  - e.g., for individuals <35 years old, consider type 1 diabetes
- **A**utoimmunity
  - e.g., personal or family history of autoimmune disease or polyglandular autoimmune syndromes
- **B**ody habitus
  - e.g., BMI <25 kg/m2
- **B**ackground
  - e.g., family history of type 1 diabetes
- **C**ontrol
  - e.g., level of glucose control on noninsulin therapies
- **C**omorbidities
  - e.g., treatment with immune checkpoint inhibitors for cancer can cause acute autoimmune type 1 diabetes or presence of other autoimmune conditions

Type 1 Diabetes Features?

Misdiagnosis is common and can occur in ~40% of adults with new type 1 diabetes

- For JR, a 28 admitted to the ICU with a blood glucose of 476 mg/dl, pH of 7.1, anion gap of 15. Recently lost 13 pounds.

Type 1 Most Discriminative Features

- Younger than 35 years at diagnosis
- Lower BMI (<25 kg/m^2)
- Unintentional weight loss
- Ketoacidosis
- Glucose 360 mg/dl or greater.

2. Diagnosis and Classification of Diabetes: Standards of Care in Diabetes—2025

Medalist Study – Harvard Joslin Diabetes Center

- After 50 years with diabetes
  - Many still produced some insulin
  - Many had no eye disease

Beta-Cell Mass Loss

- In both type 1 and type 2 diabetes,
- *genetic and environmental factors can result in the progressive loss of β-cell mass and/or function*
- that manifests clinically as hyperglycemia.
- Once hyperglycemia occurs, people with all forms of diabetes are at risk for developing the same chronic complications, although rates of progression may differ.

2. Diagnosis and Classification of Diabetes: Standards of Care in Diabetes—2025

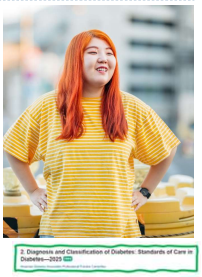
What kind of Diabetes?

- MS is 58, states she has had type 1 diabetes for 18 years. Quit smoking a year ago and gained about 20 lbs. BMI 25.
- Meds
  - Humalog 18-23 units before meals
  - Lantus 28 units at bedtime
  - Metformin 500mg TID
- What tests would you recommend?

25% of people with Type 1 also have type 2 diabetes.
ADA Post Grad, 2010

Type 1 & Type 2 - Double Diabetes?

- May be appropriate to recognize a person with type 1 diabetes *and* features classically associated with type 2 diabetes (e.g., insulin resistance, obesity, and other metabolic abnormalities.
- Can help facilitate access to appropriate treatment:
  - (e.g., GLP-1 RA or SGLT-2 inhibitor therapies for potential weight and other cardiometabolic benefits) and monitoring systems.



What type of Diabetes?

- 72 Years old
- A1c 3 months prior 6.2%
- A1c now 13.9%
- BMI 24.5
- Lost about 10 pounds over last month

Latent AutoImmunity Diabetes in Adults (LADA)

- Antibody positive to 1-2 of below
  - GAD-65 autoantibodies
  - Insulin Autoantibodies
  - Islet Cell antigen-2
  - ZnT8
- Adult Age at onset
- Usually benefit from insulin w/in first 6 months of diagnosis
- Early insulin therapy may preserve beta cell function

Latent Autoimmune Diabetes
Venkatraman Rajkumar, Steven N. Levine.
Author Information and Affiliations
Last Update: June 21, 2022.

Diabetes Care 26:536-538, 2003
Jerry P. Palmer, MD and Irl B. Hirsch, MD

LADA Clinical Features Compared to Type 2

Feature	LADA	Type 2
Age <50	63%	19%
Acute hyperglycemia	66	24
BMI < 25	33	13
Hx of autoimmune dx	27	12
Family hx autoimmune	46	35

Latent Autoimmune Diabetes
Venkatraman Rajkumar, Steven N. Levine.
Author Information and Affiliations
Last Update: June 21, 2022.

Practical Diabetology March 08, Unger MD

What about Latent Autoimmunity Diabetes in Adults (LADA)

- Slowly progressive autoimmune diabetes with an adult onset should be termed:
  - LADA or type 1 diabetes.
  - Slow autoimmune β-cell destruction can lead to a long duration of marginal insulin secretory capacity.
  - For this classification, all forms of diabetes mediated by autoimmune β-cell destruction independent of age of onset are included under the rubric of type 1 diabetes.

2. Diagnosis and Classification of Diabetes: Standards of Care in Diabetes—2025

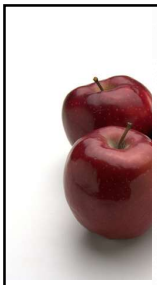
Patti Labelle

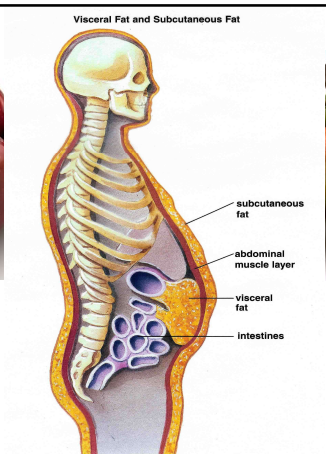
"divabetic"

“I have diabetes, it doesn’t have me”

Signs of Diabetes

- Polyuria
- Polydipsia
- Polyphasia
- Weight loss
- Fatigue
- Skin and other infections
- Blurry vision





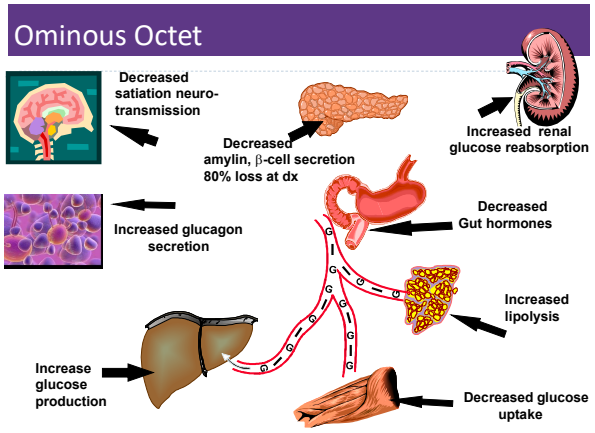
What is Type 2 Diabetes?

- Complex metabolic disorder ….
  (Insulin resistance and deficiency)

with social, behavioral and environmental risk factors unmasking the effects of genetic susceptibility.

New Diagnosis?
Call 800 – DIABETES to request "Getting Started Kit"
www.Diabetes.org

Ominous Octet



Poll Question 5

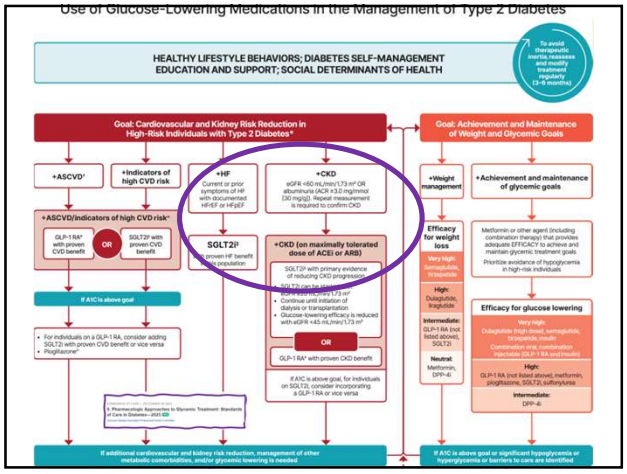
- FZ is older and lives alone and has CHF. Very concerned about avoiding hypoglycemia, since brother almost died from a hypoglycemic incident. Which medication class would you recommend?

a. Meglitinides
b. SGLT-2 Inhibitors
c. Sulfonylureas
d. Analog insulins

SGLT2 Inhibitors- "Glucoretics"

- **Action**: decreases renal reabsorption of glucose proximal tubule of kidneys (reset renal threshold)
- **Preferred** diabetes treatment for people with heart and kidney failure. Decreases BG & CV Risk.
- AWP: ~$650 a month

Class/Main Action	Name(s)	Daily Dose Range	Considerations
SGLT2 Inhibitors "Glucoretic" • Decreases glucose reabsorption in kidneys	Canagliflozin* (Invokana) Dapagliflozin*† (Farxiga) Empagliflozin*† (Jardiance) Ertugliflozin (Steglatro) Bexagliflozin (Brenzavvy)	100 - 300 mg 1x daily 5 - 10 mg 1x daily 10 - 25 mg 1x daily 5 – 15 mg 1x daily 20 mg 1x daily	**Side effects:** hypotension, UTIs, genital infections, increased urination, weight loss, ketoacidosis. **Heart Failure, CV & Kidney Protection:** 1st line therapy for Heart Failure (HF), Kidney Disease (CKD), Cardiovascular Disease, before or with metformin **Considerations:** If GFR ≥ 20, use SGLT-2 to reduce CVD, Heart Failure and Chronic Kidney Disease. Limited BG lowering effect if GFR <45. See package insert for GFR cut-offs and dosing. **Benefits:** SGLT-2s* reduce BG, CV death & HF, slow CKD. †Approved for peds, 10 yrs +. Lowers A1C 0.6% to 1.5%.



SGLT-2i Indications Summary

Drug	Lower BG	Reduce CV Risk?	Use to treat Heart Failure?	Slow renal disease?
Dapagliflozin (Farxiga)	Yes	Yes	Yes +/- Diabetes	Yes
Empagliflozin (Jardiance)	Yes	Yes	Yes +/- Diabetes	Yes
Canagliflozin (Invokana)	Yes	Yes	Yes w/ Diabetes	Yes
Ertugliflozin (Steglatro)	Yes	No	Yes w/ Diabetes	Yes
Bexagliflozin (Brenzavvy)	Yes	NA	NA	NA

Benefits of SGLT-2 Inhibitors

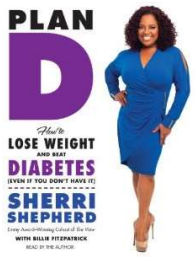
A1C lowering	Weight loss	Cardiovascular
Renal	Heart failure	Blood pressure lowering

Side Effects of SGLT-2 Inhibitors

Genitourinary infections	Volume depletion	Increased urination
Hypotension	UTI	Diabetes ketoacidosis (DKA)

Amputation risk? Fournier's gangrene?

"Getting diabetes saved my life."
~ Sherri Sheperd



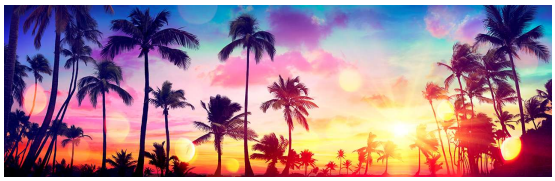
Sherri Shepard decided to embrace diabetes and use it as a motivator to improve her health.

Comparison of Type 1,Type 2, LADA

	Type 1	Type 2	LADA
Excess weight	x	xxx	x
Insulin dependence	xxx	30%	6mos
Respond to oral agents	0	xxx	x
Ketosis	xxx	x	x
Antibodies present	xxx	0	xx
Typical Age of onset	teens	adult	adult
Insulin Resistance	0	xxx	x

Other Types of Diabetes

- Other specific types of diabetes
- Gestational



Other Specific Types of DM

- Medications such as: steroids, protease inhibitors and Prograf®
- Secondary to Agent Orange
- Liver failure
- TPN or tube feedings
- Diabetes Type 3c
  - Cystic fibrosis, pancreatitis
  - Pancreatic cancers or removal
  - Hemochromatosis

Type 3c Diabetes (Pancreatogenic)

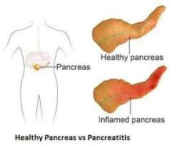
- Includes both structural and functional loss of insulin secretion in the context of exocrine pancreatic dysfunction.
- About 5-10% of diabetes, often misdiagnosed as type 2 diabetes.

- The diverse set of etiologies includes:
  - pancreatitis (acute and chronic) ~70%
  - trauma or pancreatectomy
  - neoplasia
  - cystic fibrosis
  - hemochromatosis
  - fibrocalculous pancreatopathy
  - rare genetic disorders, and idiopathic

2. Diagnosis and Classification of Diabetes: Standards of Care in Diabetes—2025

Pancreatitis

- People with diabetes 2xs risk of acute pancreatitis
- After episode of pancreatitis, one third of people will get prediabetes or diabetes
  - About 25% to 80% of people with chronic pancreatitis develop Type 3c diabetes.
- Pancreatitis is an exocrine dysfunction:
  - Disrupts global architecture or physiology of pancreas
  - Results in both exocrine and endocrine dysfunction.

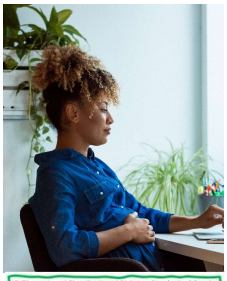


Healthy Pancreas vs Pancreatitis

2. Diagnosis and Classification of Diabetes: Standards of Care in Diabetes—2025

Screening in early Pregnancy

- Check glucose levels before 15 weeks of gestation:
  - Can find undetected diabetes or hyperglycemia
  - Prevent fetal exposure to hyperglycemia
  - Allows providers and pregnant people to take action to prevent complications
- Use standard diabetes diagnostic criteria.
  - If positive, diagnosis "Diabetes complicating pregnancy"
- If fasting BG 110+ or A1C 5.9%+
  - At higher risk of adverse outcomes and more likely to experience GDM and need insulin.



2. Diagnosis and Classification of Diabetes: Standards of Care in Diabetes—2025

Gestational Diabetes and Pregnancy

- Test for GDM at 24-28 weeks
- Test GDM women for post partum diabetes at 4-12 weeks, using OGTT
- Women with GDM need lifelong screening for prediabetes/diabetes at least every 3 yrs
- Women with hx of GDM, found to have prediabetes need intensive lifestyle interventions or metformin to prevent diabetes.

DiaBingo

B Frequent skin and yeast infections
B A BMI of ____ or greater indicates increased pre/diabetes risk?
B To reduce complications, control **A**1c, **B**lood pressure, **C**holesterol
B PreDiabetes – fasting glucose level of ___ to ____
B Erectile dysfunction indicates greater risk for ____
B Diabetes – fasting glucose level____ or greater
B Type 1 diabetes is best described as an _____ disease
B People with diabetes are _____ times more likely to die of heart dx
B Elevated triglycerides, < HDL, smaller dense LDL
B Each percentage point of A1C = _____ mg/dl glucose
B At dx of type 2, about __% of the beta cell function is lost
B Diabetes – random glucose ____ or greater

Sulfonylureas - Secretagogues or "Squirters"

- Mechanism: Stimulate beta cells to release insulin
- Dosed 1-2x daily before meals
- Adverse effects
  - Hypoglycemia, Weight gain, watch renal function
- Low cost, $12 for 3 months supply
- Can help with glucose toxicity, lowers A1C 1-2%

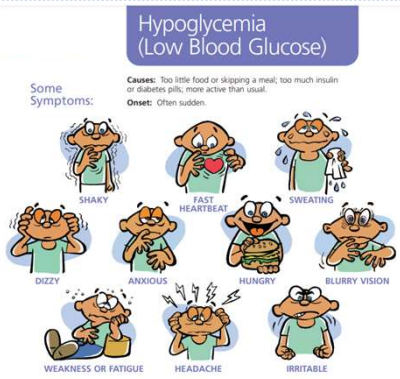
Sulfonylureas • Stimulates sustained insulin release	glyburide: (Diabeta) (Glynase PresTabs)	 1.25 – 20 mg 0.75 – 12 mg	Can take once or twice daily before meals. Low cost generic. **Side effects**: hypoglycemia and weight gain. Eliminated via kidney.
	glipizide: (Glucotrol) (Glucotrol XL)	2.5 – 40 mg 2.5 – 20 mg	**Caution**: Glyburide most likely to cause hypoglycemia.
	glimepiride (Amaryl)	1.0 – 8 mg	Lowers A1c 1.0% – 2.0%.

Reducing Hypoglycemia

- Which are the only diabetes meds that directly cause hypoglycemia?

- ❑ Insulin
- ❑ Secretagogues (sulfonylureas, glitinides)

Hypoglycemia – A Big Deal



Hypoglycemia (Glucose) Alert Values

- **BG <70mg/dl – Level 1**
- Follow 15/15 rule and contact provider to make needed changes. At increased hypo risk.


SHAKY

- **BG < 54mg/dl – Level 2**
- Indicates serious hypo. Reassess BG Goals. Consider med decrease. Predictive of Level 3 Hypo. Needs Glucagon Emergency Kit

- **Severe Hypoglycemia – Level 3**
- Altered mental, physical functioning.
- Requires external assistance – no threshold

6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2025

Hypoglycemia: Identify, Treat, & Prevent

PocketCards are updated twice yearly. Scan QR code to download or order the latest version.

SCAN ME

Step 1

Identify your signs of hypoglycemia or low blood sugar:

- Sweaty
- Shaky
- Hungry
- Can't think straight
- Headache
- Irritated, grouchy
- Other

Step 2

If have signs of hypo, treat with carbs until glucose reaches 70+, then eat usual meal.

- Sugary drink, 4–8oz
- Piece of fruit
- Raisins, handful
- Glucose tabs, 4+
- Honey/glucose gel
- Skittles candy, 15+

Step 3

Have glucagon rescue meds available.

In case of severe hypo, identify someone (ahead of time) who can get medical help & give a glucagon rescue medication.

Notify your provider of low blood sugar events.

Hypoglycemia Levels:

Level 1 – Glucose less than 70
Level 2 – Glucose less than 54
Level 3 - Severe, needs assistance

Identify Causes of Hypo & Problem Solve to Prevent Future Episodes

» Low carb meal
» Extra activity
» Drinking alcohol
» Delayed, missed meal
» Too much insulin/meds
» Insulin timing

www.DiabetesEd.net

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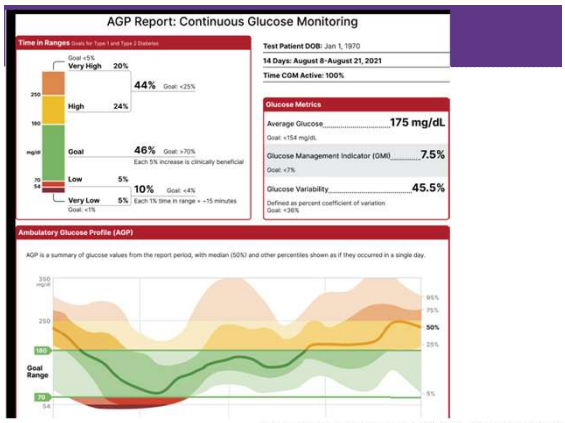


6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2025

Hypo Marker of CV Events & Mortality

Severe hypoglycemia a potent marker of high absolute risk of cardiovascular events and mortality.

HCP need to be vigilant in preventing hypoglycemia.

Avoid aggressively attempting to achieve near-normal A1C levels if such goals cannot be safely and reasonably achieved.

6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2025

SDOH and Hypoglycemia

Food insecurity, housing instability, underinsured, under-resourced living areas is associated with increased risk of hypoglycemia-related emergency department visits

Identify if fasting part of religious observances

Young children and older adults at highest risk

Insulin pumps with automated low-glucose suspend and automated insulin delivery systems have been shown to be effective in reducing hypoglycemia in type 1 diabetes

6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2025

Assess for Hypo

- Review history of hypoglycemia at every clinical encounter for all individuals at risk for hypoglycemia
- Evaluate hypoglycemic events
- Screen for impaired hypoglycemia awareness at least annually.

- Consider individual's risk for hypoglycemia when selecting diabetes medications and glycemic goals.
- Use of CGM is beneficial and recommended for individuals at high risk for hypoglycemia.

6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2025

Hypoglycemia: Clinical Risk Factors

Table 6.5—Assessment of hypoglycemia risk among individuals treated with insulin, sulfonylureas, or meglitinides

Clinical and biological risk factors	Social, cultural, and economic risk factors
Major risk factors • Recent (within the past 3–6 months) level 2 or 3 hypoglycemia • Intensive insulin therapy* • Impaired hypoglycemia awareness • End-stage kidney disease • Cognitive impairment or dementia	Major risk factors • Food insecurity • Low-income status§ • Housing insecurity • Fasting for religious or cultural reasons • Underinsurance
Other risk factors • Multiple recent episodes of level 1 hypoglycemia • Basal insulin therapy* • Age ≥75 years† • Female sex • High glycemic variability‡ • Polypharmacy • Cardiovascular disease • Chronic kidney disease (eGFR <60 mL/min/1.73 m^2 or albuminuria) • Neuropathy • Retinopathy • Major depressive disorder • Severe mental illness	Other risk factors • Low health literacy • Alcohol or substance use disorder

6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2025

Tx of Level 2 & 3 Hypoglycemia

- If can swallow w/out risk of aspiration, try gel, honey, etc. inside cheek
- If unable to swallow, D50 IV or Glucagon

- Glucagon injection (need Rx)
  - Inform and instruct caregivers, school personnel, family, coworkers of hypo signs and appropriate action
  - Dosing: Adults 1mg, Children <20kg 0.5mg
  - Glycemic effect 20 - 30mg, short lived
  - Must intake carb as soon as able
- If on Insulin or level 2 or 3 hypo, (<54), get Glucagon ER Kit. Re-evaluate diabetes med treatment plan.

6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2025

Glucagon Rescue Medications for Diabetes-Related Hypoglycemia

Name/Delivery	Supplied	Dose Range		Age / Route / Storage
		Adult	Peds / Age WT Dosing	
Glucagon Emergency Kit Injection requires mixing glucagon powder	1mg / 1mL vial + syringe	1mg	0.03mg/kg or < 6yrs or < 25 kgs | 0.5mg ≥ 6yrs or > 25kgs | 1mg	All ages approved SubQ or IM admin Expires in 2 years at room temp.
Baqsimi Nasal glucagon powder	3 mg intranasal device	3 mg	< 4 yrs: not recommended 4 yrs or older | 3mg dose	Approved Age 4+ Nasal admin Expires ~ 2 years at room temp (keep in shrink-wrapped tube).
Gvoke Injectable liquid stable glucagon solution	0.5mg or 1.0mg in -Prefilled syringe -HypoPen auto-injector -Kit with vial and syringe	1 mg	< 2yrs: not recommended 2- 12 yrs < 45kg | 0.5mg ≥ 45kg | 1mg 12 yrs or older | 1mg	Approved Age 2+ SubQ admin in arm, thigh, abdomen Expires in 2 years at room temp (keep in foil pouch).
Dasiglucagon (Zegalogue) Stable liquid glucagon analog	0.6mg/0.6mL Prefilled syringe Autoinjector	0.6mg	< 6yrs: not recommended 6 yrs or older | 0.6mg	Approved Age 6+ SubQ in abdomen, buttocks, thigh outer upper arm Expires in 1 year at room temp. (store in red protective case).

**All raise BG 20+ points. Can cause nausea, vomiting. After admin, roll person on side. Seek medical help. If no response after 1st dose, give 2nd dose in 15 mins. When awake, give oral carbs ASAP when safe to swallow. Please consult package insert for detailed info.*

All PocketCard content is for educational purposes only. Please consult prescribing information for detailed guidelines

DiabetesEd.net

6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2025

Poll Question 6

- JL is 78 and drinks a "few cocktails" every night. Lives with partner and takes basal insulin at night and bolus insulin as needed. Has had a few low blood glucose levels in past week of 62, 49 and 51. What is the most important recommendation?

- A. Decrease alcohol intake
- B. Check BG at least 4 times a day.
- C. Double check injection sites.
- D. Get glucagon rescue medication.

Hyperglycemic Crisis

Table 6.8—Diagnostic criteria for DKA and HHS

DKA	
Diabetes/hyperglycemia	Glucose ≥200 mg/dL (11.1 mmol/L) or prior history of diabetes
Ketosis	β-Hydroxybutyrate concentration ≥3.0 mmol/L or urine ketone strip 2+ or greater
Metabolic acidosis	pH <7.3 and/or bicarbonate concentration <18 mmol/L
HHS	
Hyperglycemia	Plasma glucose ≥600 mg/dL (33.3 mmol/L)
Hyperosmolarity	Calculated effective serum osmolality >300 mOsm/kg (calculated as [2×Na^+ (mmol/L) + glucose (mmol/L)] or total serum osmolality >320 mOsm/kg [2×Na^+ (mmol/L) + glucose (mmol/L) + urea (mmol/L)]
Absence of significant ketonemia	β-Hydroxybutyrate concentration <3.0 mmol/L OR urine ketone strip less than 2+
Absence of acidosis	pH ≥7.3 and bicarbonate concentration ≥15 mmol/L

Adapted from Umpierrez et al. (151).

Table 6.9—Risk factors for hyperglycemic crises

Type 1 diabetes/absolute insulin deficiency
Younger age
Prior history of hyperglycemic crises
Prior history of hypoglycemic crises
Presence of other diabetes complications
Presence of other chronic health conditions (particularly in people with type 2 diabetes)
Presence of behavioral health conditions (e.g., depression, bipolar disorder, and eating disorders)
Alcohol and/or substance use
High A1C level
Social determinants of health

Data are from McCoy et al. (184), Gibb et al. (185), Randall et al. (186), and Thomas et al. (187).

Table 6.10—Clinical presentation in people with diabetes with DKA and HHS

DKA	HHS
Develops over hours to days	Develops over days to a week
Usually alert	Change in cognitive state common
Polyuria, polydipsia, weight loss, and dehydration	
Nausea, vomiting, and abdominal pain	Often copresenting with other acute illness
Kussmaul respiration	
One-third of hyperglycemic emergencies have a hybrid DKA-HHS presentation	

Adapted from Umpierrez et al. (151).

	HHS	DKA	EDKA
Labs	**HHS**	**DKA**	**EDKA**
Glucose	600+	200+	<200
Beta-hydroxybutyrate	<3	3+	3+
Urine ketones	<2	2+	2+
Blood pH	7.3+	<7.3	<7.3
Bicarb	15+	<18	<18
Serum osmolality	300+		
Anion gap (if used)	<12	>12	>12

ADA/EASD/AACE 2024 Hyperglycemic Crises in Adults Consensus Report – From Level 2 Hyperglycemic Crisis

Quick Question 7

- JZ is excited about his A1c of 5.4%. He takes rapid acting insulin 4-6 times a day using a pen to keep his BG to target. Plus, adjusts glargine as needed if his pm BG is elevated. What is your biggest concern?

A. Does he change his needle each time?

B. Why is he adjusting glargine?

C. Is he adjusting insulin for exercise?

D. How many hypoglycemic events per week?

8. Obesity and Weight Management for Prevention & Treatment of Type 2 Diabetes

- Use person centered language that fosters collaboration
- *Once a year, monitor obesity-related anthropometric measurements to inform treatment considerations*
  - *BMI, waist circumference, waist-to-hip-ratio and waist to-height-ratio*
- Be sensitive and allow for privacy when weighing

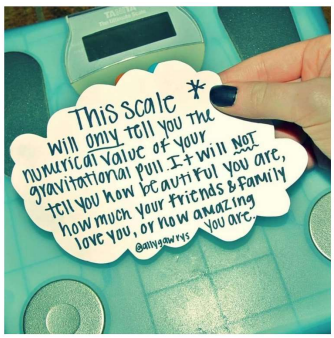
8. Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes: Standards of Care in Diabetes-2025

Weight Stigma

- Weight stigma, fat bias, and anti-fat bias are ways to describe the bias toward people living in larger bodies.
- Fat bias is prevalent among health care professionals and general public.
- Health care professionals are strongly encouraged to increase their awareness of implicit and explicit weight-biased attitudes.
- Increasing empathy and understanding about the complexity of weight management among health care professionals is a useful avenue to help reduce weight bias.

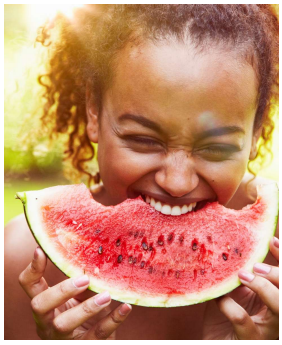
8. Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes: Standards of Care in Diabetes-2025

Weight is a Heavy Issue



Medical Nutrition Therapy Works

- MNT is effective and beneficial to people with diabetes.
- When delivered by an RDN, MNT is associated with A1C absolute decreases of
  - 1.0–1.9% for people with type 1 diabetes and
  - 0.3–2.0% for people with type 2 diabetes



Healthy Eating Patterns/Approaches

Eating Patterns: Total Foods Consumed

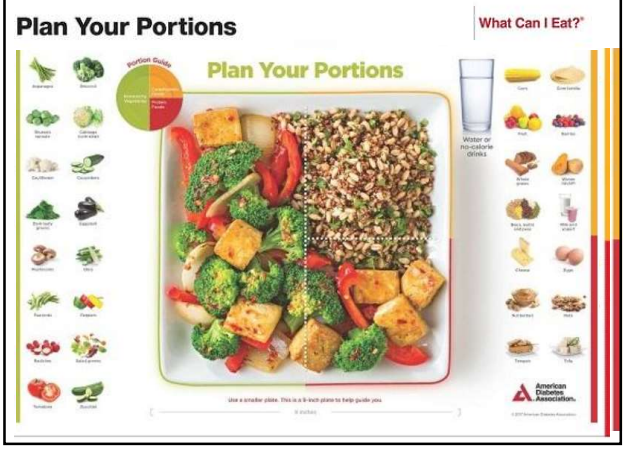
- Mediterranean Diet
- Plant based eating
- DASH (Dietary Approaches to Stop Hypertension)
- Low Carbohydrate

Eating Approach: Tools for developing an eating pattern

- Diabetes Plate Method
- Carbohydrate Counting
- Individualized behavioral approaches

Use Integrative food-based approach.
"People eat food, not nutrients".

5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: Standards of Care in Diabetes—2025



Assessing Malnutrition

- At Risks Groups:
  - Individuals on GLP-1 or GIP RA or after metabolic surgery
  - Individuals with multiple chronic conditions
  - Older age groups
  - Food insecurity and poverty
- Screen:
  - For malnutrition and sarcopenia
- Recommend:
  - Whole- food-based eating pattern
  - Adequate protein
  - Resistance training

Malnutrition is defined by the World Health Organization as "deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients."

STANDARDS OF CARE | DECEMBER 09 2024

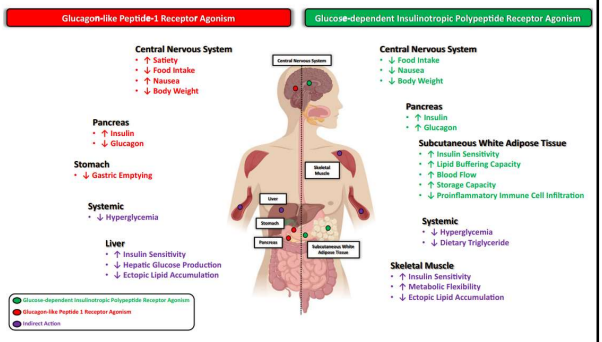
5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: Standards of Care in Diabetes—2025

American Diabetes Association Professional Practice Committee

Incretins: GLP & GIP Receptor Agonists

GLP-1: glucagon like peptide 1
GIP: glucose-dependent insulinotropic polypeptide

Actions of GLP-1 and GIP



Samms RJ, Coghlan MP, Sloop KW. How May GIP Enhance the Therapeutic Efficacy of GLP-1? Trends Endocrinol Metab. 2020 Jun;31(6):410-421.

Pocket Card: GLP-1 & GIP RA

GLP-1 & GIP Receptor Agonists

Class/Main Action	Name	Dose Range	Considerations
GLP-1 RA - Glucagon Like Peptide Receptor Agonist **"Incretin Mimetic"** • Increases insulin release with food • Slows gastric emptying • Promotes satiety • Suppresses glucagon	exenatide (Byetta)	5 and 10 mcg BID	**Side effects:** nausea, vomiting, weight loss, injection site reaction. Report signs of acute pancreatitis or intestinal blockage (ileus) and stop med. **Black box warning:** Thyroid C-cell tumor warning (avoid if family history of medullary thyroid tumor). *Significantly reduces risk of CV death, heart attack, and stroke. §Approved to reduce risk of CKD †Approved for pediatrics 10-17 yrs Lowers A1C 0.5 – 1.6% Weight loss: 4-6% body weight loss.
	exenatide XR† (Bydureon)	2 mg 1x a week Pen injector - Bydureon BCise	
	liraglutide*† (Victoza)	0.6, 1.2 and 1.8 mg daily	
	dulaglutide*† (Trulicity)	0.75, 1.5, 3.0 and 4.5 mg 1x a week pen injector	
	semaglutide*§ (Ozempic)	0.25, 0.5, 1.0 and 2.0 mg 1x a week pen injector	
	(Rybelsus) Oral tablet	3, 7, and 14 mg daily in a.m. Take on empty stomach with sip of water	
GLP-1 & GIP Receptor Agonist Activates receptors for GLP-1 (see above) & Glucose-dependent Insulinotropic Polypeptide (GIP).	Tirzepatide (Mounjaro)	2.5, 5.0, 7.5, 10, 12.5 and 15 mg 1x a week prefilled single dose pen Increase dose by 2.5 mg once monthly to reach targets.	**Side effects:** nausea, diarrhea, injection site reaction. Report pancreatitis, signs of intestinal blockage. **Black box warning:** Avoid if family history of medullary thyroid tumor. Lowers A1C ~ 1.8 - 2.4% Weight loss: 7-13% body weight loss at max dose.

DiabetesEd.net ©2025

Counseling Points: GLP-1 RA & GLP-1/GIP

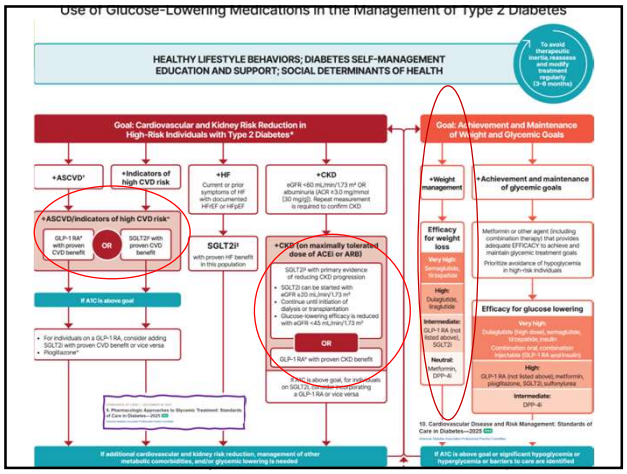
- Avoid if personal or family history of medullary thyroid cancer
- Avoid in combo with DPP-4 inhibitors
- Watch for intestinal obstruction
- Use of non-FDA *compounded* products not recommended
- Avoid with history pancreatitis
- If on tirzepitide, use back up contraception for first 4 weeks
- Ask about recent eye exam
  - Potential increase in diabetes retinopathy

Sudden discontinuation of semaglutide and tirzepitide results in regain of one-half to two-thirds of the weight loss within 1 year. Consider trying lowest effective dose, using intermittent therapy, or stopping medication followed by close weight monitoring.

Poll Question 8

AR is 36 years old with type 2 diabetes and a BMI of 41kg/m^2. Current diabetes medications include: metformin, sitagliptin (Januvia) and empagliflozin (Jardiance) at maximum doses. AR is prescribed tirzepatide (Mounjaro). Based on this information, what action do you recommend to the provider?

A. Verify kidney function first.
B. Stop the sitagliptin when initiating tirzepatide.
C. Decrease the dose of metformin to prevent hypoglycemia.
D. Evaluate thyroid function before starting tirzepatide.



GLP-1/GIP Receptor Agonist Indications

"Recent clinical trial suggests that the GLP-1 RA semaglutide has beneficial effect on CVD, mortality, and kidney outcomes among people with CKD - recommend that semaglutide be used as another first-line agent for people with CKD".

Exenatide IR **(Byetta)** Lixisenatide **(Adlyxin)** Semaglutide **(Rybelsus)**	Yes		
Exenatide ER **(Bydureon)**	Yes for 10 yrs and older		
Dulaglutide **(Trulicity)**	Yes for 10 yrs and older	Yes	
Semaglutide **(Ozempic)**	Yes	Yes Kidney protective	Yes Wegovy 2.4mg
Liraglutide **(Victoza)**	Yes for 10 yrs and older	Yes	Yes Saxenda 3mg
Tirzepatide **(Mounjaro)**	Yes	?	Yes, Zepbound up to 15 mg

GLP-1 /GIPs Approved for Weight Loss

- Liraglutide:
  - Victoza 1.8 mg (diabetes)
  - Saxenda 3 mg (wt loss)
  - 6% wt loss, $1349 a mo
- Semaglutide:
- Ozempic 2mg (diabetes)
  - Wegovy 2.4mg (wt loss)
  - 6% wt loss, $1349 a mo
- Tirzepatide
  - Mounjaro 15mg (diabetes)
  - Zepbound (wt loss)
  - 13% wt loss - $1056 a mo

All 3 Approved for use in adults with a:

- BMI of ≥ 30 or
- BMI of ≥ 27 or greater who have hypertension, type 2 diabetes, or dyslipidemia.

Metabolic Surgery Stats

- Surgical Treatment and Medications Potentially Eradicate Diabetes Efficiently (STAMPEDE) trial, randomized 150 participants with diabetes to receive [illegible]
- Metabolic surgery, which results in an average >20% body weight loss, greatly improving glycemia and often leading to remission of diabetes, improved quality of life, improved cardiovascular outcomes, and reduced mortality
- [illegible] have remission eventually [illegible] recurrence.
  - Median disease-free period among such individuals following RYGB is 8.3 years
  - Majority of those who undergo surgery maintain substantial improvement of glycemia from baseline for at least 5–15 yrs

8. Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes: Standards of Care in Diabetes-2025

Exercise Standards

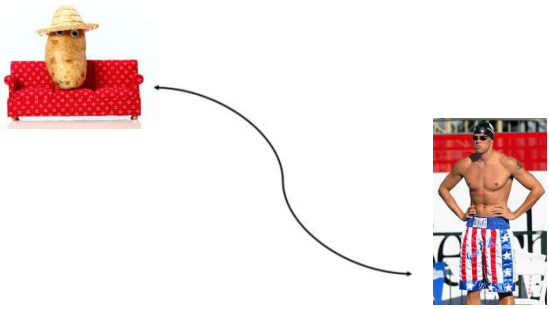
- Adults – 150 min/wk moderate intensity
  - over 3 days a week.
  - Don't miss > 2 consecutive days w/out exercise
  - Get up every 30 mins - Reduce sedentary time
  - Flexibility and balance training 2-3 xs a week (Yoga and Tai Chi)
  - T1 and T2 – resistance training 2 -3 x's a week

A hard truth

- Exercise alone doesn't cause weight loss
- But….
  - It helps keep weight off
  - Decreases visceral adiposity
  - Decreases CV Risk

- To combat the rise in body weight, we need to change the food environment
- "You cannot outrun an unhealthy diet".

Where are we on this continuum?



Good Exercise Info / Quotes

- **"Passagiata" – take an after meal stroll**
- Exercise decreases A1C 0.7%
- No change in body wt, but 48% loss in visceral fat.

"Every minute of activity lowers blood sugar one point."

"I don't have time to exercise, I MAKE time."

6. Glycemic Goals & Hypo

A1C

Blood Pressure

Cardiovascular risk reduction

6. Glycemic Targets for Non-Pregnant Adults

- **A1c < 7%** - a reasonable goal for adults.
- **A1c < 6.5%** - for those without significant risk of hypoglycemia
- **A1c < 8%** - for those with history of hypoglycemia, limited life expectancy, or those with longstanding diabetes and vascular complications.
- **A1c Check Frequency:**
  - If meeting goal - At least 2 times a year
  - If *not* meeting goal – Quarterly
- **Also review Ambulatory Glucose Profile**

6. Glycemic Targets
Individualize Targets – ADA

- Pre-Prandial BG 80- 130
- 1-2 hr post prandial < than 180
  *for nonpregnant adults
- Time in Range: 70%
  - BG of 70-180 mg/dL

A1c and Estimated Avg Glucose (eAG)

A1c (%)	eAG
5	**97** (76-120)
6	**126** (100-152)
7	**154** (123-185)
8	**183** (147-217)
9	**212** (170 -249)
10	**240** (193-282)
11	**269** (217-314)
12	**298** (240-347)

eAG = 28.7 x A1c-46.7 ~ 29 pts per 1%
Translating the A1c Assay Into eAG – ADAG Study

6. Glycemic Targets: *Standards of Medical Care in Diabetes—2020*

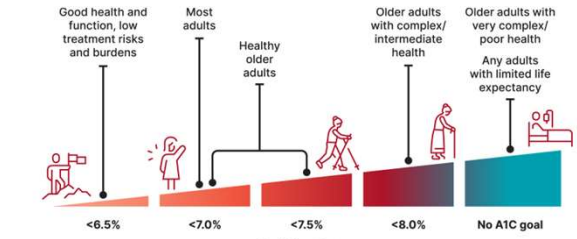
American Diabetes Association
Diabetes Care 2020 Jan; 43(Supplement 1): S66-S76.
https://doi.org/10.2337/dc20-S006

Ambulatory Glucose Profile

- Standardized report with visual cues for those on CGM devices
- For most with type 1 or type 2 diabetes
  - > 70% of readings within BG range of 70-180mg/dL
  - < 4% of readings < 70 mg/dL
  - < 1% of readings < 54 mg/dL
  - < 25% of readings > 180 mg/dL
  - < 5% of readings > 250 mg/dL

For those with frailty or at high risk of hypoglycemia recommend:
- Target of 50% time in range
- Less than1% time below range

6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2025



Modifying Factors

Favor more stringent goal	Favor less stringent goal
Short diabetes duration	Long diabetes duration
Low hypoglycemia risk	High hypoglycemia risk
Low treatment risks and burdens	High treatment risks and burdens
Pharmacotherapy with cardiovascular, kidney, weight, or other benefits	Pharmacotherapy without nonglycemic benefits
No cardiovascular complications	Established cardiovascular complications
Few or minor comorbidities	Severe, life-limiting comorbidities

Table 6.2

6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2025

"The highest form of wisdom is kindness." The Talmud

ADA 2025 Summary for Exams

A1c less than 7% (individualize)

- Pre-meal BG 80-130
- Post meal BG <180
- Time in Range (70-180) 70% of time

Blood Pressure <130/80

Cholesterol

- Statin therapy based on age & risk status
- If 40+ with ASCVD Risk, decrease LDL by 50%, LDL <70
- If 40+ with ASCVD, decrease LDL by 50%, LDL <55

DiaBingo- G

G ADA goal for A1c is less than ____%

G People with DM need to see their provider at least every month

G Blood pressure goal is less than

G People with DM should see eye doctor (ophthalmologist) at least

G The goal for triglyceride level is less than

G Goal for LDL cholesterol for people 40+ with diabetes is _____

G The goal for blood sugars 1-2 hours after a meal is less than:

G People with DM should get this shot every year

G People with DM need to get urine tested yearly for _____

G Periodontal disease indicates increased risk for heart disease

G The goal for blood sugar levels before meals is:

G The activity goal is to do ___ minutes on most days

Chronic Kidney Disease– 2025 Update

- Optimize glucose and BP to protect kidneys.
- Use SGLT-2 with demonstrated benefit to reduce CKD and CVD*
- To reduce CV risk and CKD, use a GLP-1* with demonstrated benefit.
- In people with CKD and albuminuria, a nonsteroidal MRA effective if GFR 25+
- Aim to reduce urinary albumin by ≥30% in people with CKD
  - *SGLT-2i's
    - Empagliflozin (Jardiance), canagliflozin (Invokana), dapagliflozin (Farxiga)
  - *GLP-1 RA's
    - Semaglutide (Ozempic), liraglutide (Victoza), dulaglutide (Trulicity)

Albuminuria Categories	Urinary Albumin Creatine Ratio (UACR)
Normal to mildly increased – A1	< 30 mg/g
Moderately increased – A2	30 – 299 mg/g
Severely increased – A3	300 mg/g +

Kidney Disease Stage	GFR
Stage 1 – Normal	90+
Stage 2 – Mild loss	89 - 60
Stage 3a – Mild to Mod	59 - 45
Stage 3b – Mod to Severe	44 - 30
Stage 4 – Severe loss	29 -15
Stage 5 – Kidney failure	14 - 0

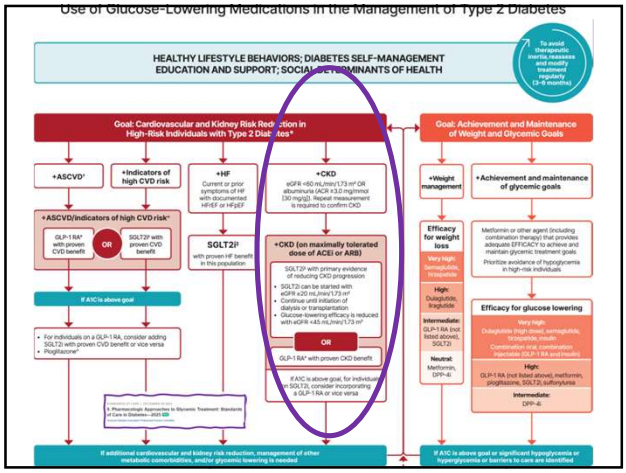
11. Chronic Kidney Disease and Risk Management: Standards of Care in Diabetes—2025

Standard 11 – Protect Kidneys

- Diabetes with CKD - GFR ≥20
- Start SGLT2 to reduce chronic kidney disease progression and cardiovascular events.
- Also consider GLP-1 RA – (ie semaglutide)

- If type 2 diabetes and established Chronic Kidney Disease (CKD)
  - Start nonsteroidal mineralocorticoid receptor antagonist (finerenone) and/or GLP-1 RA recommended for cardiovascular risk reduction.

11. Chronic Kidney Disease and Risk Management: Standards of Care in Diabetes—2025



Poll Question 9

- JR is newly diagnosed with type 2. A1C is 7.9. GFR is 63. UACR 26 mg/g. History of CHF. According to 2025 ADA Standards, what med along with lifestyle should be started first?

a. Only Metformin, since A1C is close to target.

b. Metformin or SGLT-2

c. Sulfonylurea

d. GLP-1 or Metformin

Finerenone Resource

New nonsteroidal MRAs for Type 2 and Chronic Kidney Disease

Nonsteroidal Selective Mineralocorticoid Antagonist

Indicated for people with chronic kidney disease (CKD) associated with Type 2 diabetes. Reduces the risk of kidney function decline, kidney failure, cardiovascular death, non-fatal heart attacks, and hospitalization for heart failure in adults with chronic kidney disease associated with type 2 diabetes. The mineralocorticoid receptor antagonist blocks the effects of aldosterone and reduces the risk of kidney function decline as well as heart failure.

Class / Action	Generic / Trade Name	Daily Dose	Frequency	Considerations
Nonsteroidal, selective mineralocorticoid antagonist. Blocks mineralocorticoid receptor mediated sodium reabsorption and mineralocorticoid overactivation in epithelial (for example kidneys) and nonepithelial (for example heart, blood vessels) tissues.	**Finerenone / Kerendia**	**10-20 mg**	**Once daily**	Monitor potassium 4 weeks after initiation or dose adjustment (although impact on potassium is much less than non-slective mineralocorticoid antagonists like spironolactone). Since medication is a CYP3A4 substrate, avoid taking with other strong cype3A4 inhibitors. Avoid grapefruit or grapefruit juice. May take with or without food.

Contributor: Diana Isaacs, PharmD, BCPS, BCACP, BC-ADM, CDCES, FADCES, FCCP 2022

Kidney Goals and MNT

- In people with chronic kidney disease with UACR ≥300 mg/g
- Goal is a reduction of 30% or greater in mg/g urinary albumin to slow chronic kidney disease progression

11. Chronic Kidney Disease and Risk Management: Standards of Care in Diabetes—2025

- Nutrition Recommendations
- For people with non–dialysis-dependent stage 3 or higher chronic kidney disease
  - dietary protein intake aimed to a target level of 0.8 g/kg body weight per day.
- For those on dialysis,
  - consider protein intake of 1.0–1.2 g/kg/day since protein energy wasting is a major problem in some individuals on dialysis
- Refer to nephrology
  - If GFR < 30 or uncertain CKD etiology

A 67 yr old man, smokes ppd

- A1c 8.9% (down from 10.4%)
- B/P 139/76 AM BG 100, 2 hr pp 190
- Chol – TG 54, HDL 46, LDL 98
- GFR 47, UACR 34 mg/g

- Meds:
  - Insulin – 28 units basaglar insulin
  - Losartan 25mg – ARB for blood pressure
  - Metoprolol 50mg – Beta blocker
  - Glyburide 5mg BID - Sulfonylurea

Special instruction – sweating may indicate hypoglycemia

Any special instructions?
Any meds missing?
Stop any meds?

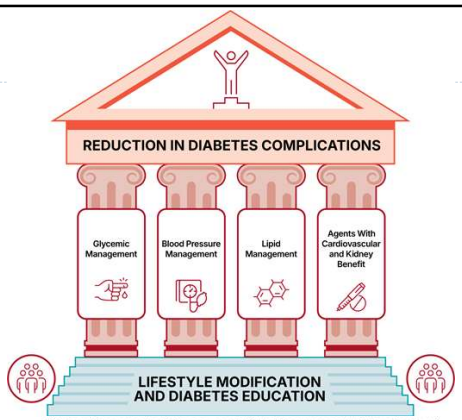
10. Cardiovascular Disease and Risk Management

- Higher risk of Atherosclerotic cardiovascular disease (ASCVD):
  - history of acute coronary syndrome,
  - myocardial infarction (MI),
  - stable or unstable angina,
  - coronary or other arterial revascularization,
  - stroke, transient ischemic attack,
  - or peripheral artery disease (PAD) including aortic aneurysm.
- Plus 2x's risk of Heart Failure
- Leading cause of morbidity and mortality in people with diabetes

Large benefits are seen when multiple CV risk factors are addressed simultaneously

With more aggressive goals, rates of CVD have decreased.
CV Risks predicted to increase in future.

10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025



10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025 FREE

American Diabetes Association Professional Practice Committee

Cardiac and Renal Disease

- The combination of 3 comorbidities has been termed *cardiorenal metabolic disease* or *cardiovascular-kidney-metabolic* health
  - ASCVD, heart failure, and chronic kidney disease (CKD)
- Recognized interrelationship of cardiometabolic risk factors leading to cardiovascular disease and adverse kidney outcomes in people with diabetes.
  - 3 comorbidities frequently associated with metabolic risk factors & extra weight
  - Incidence of all three conditions rises with *increasing* A1C levels.

10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025

Screening for Undiagnosed Cardiovascular Disease

	Coronary Artery Disease	Heart Failure	Peripheral Artery Disease
Who to Screen?	Routine screening is not recommended for asymptomatic individuals.	Screen all adults with diabetes, which increases risks for asymptomatic (stage B) and symptomatic (stage C) HF.	Screen individuals with diabetes and age ≥65 years, any microvascular disease, foot complications, or end-stage organ damage from diabetes, if a PAD diagnosis would change management. Consider screening anyone with a diabetes duration ≥10 years.
	If signs or symptoms of cardiac or associated vascular disease, or electrocardiogram abnormalities are present, screen using routine methods.	Measure BNP or N-terminal pro-BNP. Echocardiography is recommended for those with abnormal BNP levels.	Screen with ankle-brachial index testing.

10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025

Assess ASCVD and Heart Failure Risk Yearly

- Duration of diabetes & 55+
- BMI
- Hypertension
- Dyslipidemia
- Smoking
- Family history of premature coronary disease
- Chronic kidney disease – presence of albuminuria

Treat modifiable risk factors as described in ADA guidelines.

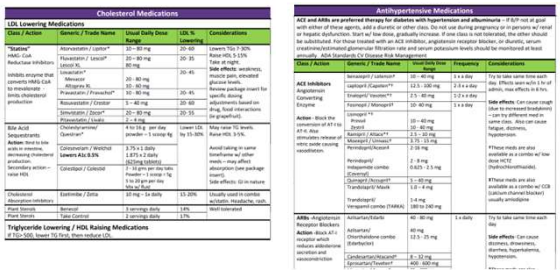
BP Treatment in addition to Lifestyle

- **First Line B/P Drugs if 130/80 +**
  - With albuminuria or ASCVD
    - Start either ACE or ARB*
  - No albuminuria - Any of the 4 classes of BP meds can be used:
    - *ACE Inhibitors, *ARBs, *thiazide-like diuretics or calcium channel blockers.
    - *Monitor K+ 7-14 days after start/annually
  - Avoid ACE and ARB at same time
  - Multiple Drug Therapy often required
- **If B/P ≥ 150 /90 start 2 drug combo**

*Albuminuria = Urinary albumin creatinine ratio of 30+

10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025

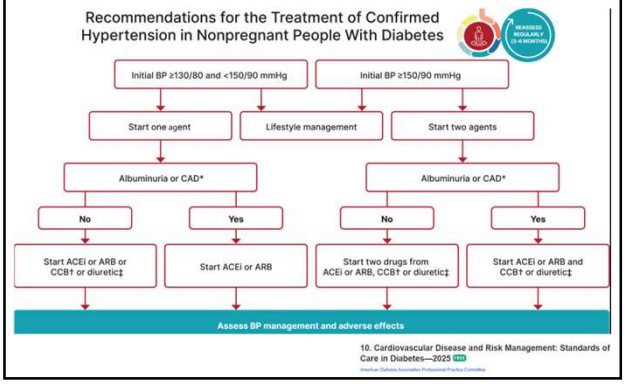
Lipid and HTN Meds Cheat Sheets



Website: https://diabetesed.net/coach-bevs-diabetes-cheat-sheets/
On CDCES Coach App too

For exam, know major classes, when used, side effects and considerations.

Hypertension Management



Poll Question 10

RZ is 47 years old with type 2 diabetes and hypertension. RZ takes metformin 1000 mg BID, plus lisinopril 20mg daily. RZs LDL is 130 mg/dL. Based on the most recent ADA Standards, what is the LDL Cholesterol target for RZ?

A. LDL less than 100 mg/dL.
B. Lower LDL by 30%.
C. LDL target of 65 mg/dL or less.
D. Determine LDL target based on ASCVD risk.

Lipid Goals – Primary Prevention

- For people with diabetes aged 40–75:
- No ACSVD Risk – Start Moderate intensity statin
- Higher cardiovascular risk*
  - (*HTN, Smoke, CKD, BMI 30+ albuminuria, family hx ACSVD)
  - **High-intensity statin** therapy is recommended
- **Reduce LDL cholesterol by at least 50% of baseline**
  AND
- **Target LDL cholesterol <70 mg/dL.**

- **If LDL cholesterol 70 +**
- it may be reasonable to add ezetimibe or a PCSK9 inhibitor to maximum tolerated statin therapy.

10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025

Statin Dosing

High Intensity: Lowers LDL ≥50%

- Lipitor (atorvastatin)
  - 40-80mg
- Crestor (rosuvastatin)
  - 20-40mg

*****If person can't tolerate intended statin dose, use maximally tolerated dose**

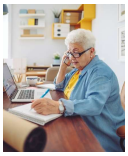
Moderate Intensity: Lower LDL 30-<50%

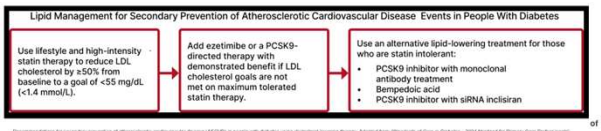
- Lipitor (atorvastatin)
  - 10-20mg
- Crestor (rosuvastatin)
  - 5-10mg
- Zocor (Simvastatin)
  - 20-40mg
- Pravachol (pravastatin)
  - 40 – 80mg
- Mevacor (lovastatin) 40 mg
- Lescol (fluvastatin) XL 80mg
- Livalo (pitavastatin) 2-4mg

10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025

Lipid Goals for People *with* ASCVD

- For people of all ages with diabetes and atherosclerotic cardiovascular disease:
  - Add high-intensity statin to lifestyle therapy.
  - **Reduce LDL cholesterol by 50% or greater from baseline with LDL cholesterol goal of <55.**
  - Addition of ezetimibe or a PCSK9 inhibitor with proven benefit in recommended if goal is not achieved on maximum tolerated statin therapy.





New Lipid Lowering Medications

Contributor: Diana Isaacs, PharmD, BCPS, BCACP, BC-ADM, CDCES, FADCES, FCCP 2022

PCSK9 Inhibitors Lipid Medications
Proprotein convertase subtilisin/kexin type 9

	Alirocumab (Praluent)	Evolocumab (Repatha)
FDA-approved indications	• Primary hyperlipidemia (HLD) • Homozygous familial hypercholesterolemia (HoFH) • Secondary prevention of cardiac events	
Dosing	• **HoFH**: 150 mg SC q2 weeks • **HLD or secondary cardiac prevention**: 75 mg SC q2 weeks or 300 mg SC q4 weeks; if adequate LDL response not achieved, may increase to max of 150 mg q2 weeks	• **HoFH**: 420 mg SC q4 weeks; may increase to 420 mg q2 weeks if meaningful response not achieved in 12 weeks • **HLD or secondary cardiac prevention**: 140 mg q2 weeks or 420 mg q4 weeks
Dosage forms	• Auto-injector 75 mg/mL or 150 mg/mL	• Repatha Sure Click (auto-injector) 140 mg/mL • Repatha Pushtronex System (single use infusor with pre-filled cartridge) 420 mg/3.5 mL – administered over 9 minutes
Storage	• Store in refrigerator in outer carton until used • Once used, keep at room temperature, use within 30 days	
Injection clinical pearls	• Do not shake or warm with water • Administer by SC injection into thigh, abdomen, or upper arm • Rotate injection site with each injection	
Drug interactions	• No known significant interactions	
Monitoring parameters	• Lipid panel before initiating therapy, 4-12 weeks after initiating, and q3-12 months thereafter	
Side effects	• Injection site reaction (4-17%) • Hypersensitivity reaction (9%) • Influenza (6%) • Myalgia (4-6%) • Diarrhea (5%)	• Nasopharyngitis (6-11%) • Upper respiratory tract infection (9%) • Diabetes mellitus (9%) • Influenza (8-9%) • Injection site reaction (6%) • Myalgia (4%)

From Meds Cheat Sheet Page

*Bempedoic acid, a novel LDL cholesterol–lowering agent acting in the same pathway as statin but without activity in skeletal muscle, which limits the muscle-related adverse effects, lowers LDL cholesterol levels by 15% for those on statins and 24% for those not taking statins (140). Use of this agent with ezetimibe results in an additional 19% reduction in LDL cholesterol

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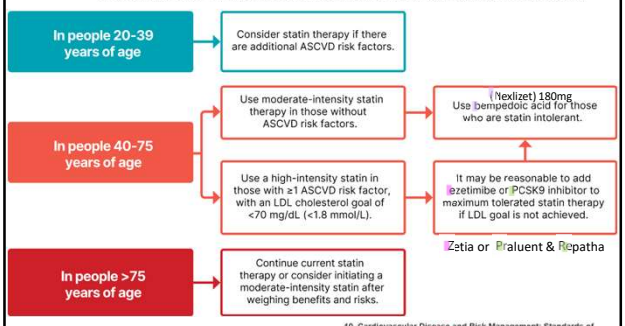


10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025 FREE

Coronary Vessel Disease Meds

- In those with CVD or at higher risk:
  - Get blood glucose to goal
  - Statin therapy with addition of ezetimibe or a PCSK9 inhibitor recommended if goals not achieved on maximum tolerated statin therapy.
  - B/P Med (ACE or ARB)
  - Beta blocker after MI or CHF
  - Aspirin (or another agent)
  - Diabetes Meds that significantly decrease CV events:
    - *SGLT-2i's
      - Empagliflozin (Jardiance), canagliflozin (Invokana), dapagliflozin (Farxiga)
    - *GLP-1 RA's
      - Semaglutide (Ozempic), liraglut

10. Cardiovascular Disease and Risk Management: *Standards of Care in Diabetes—2024* FREE

A 67 yr old man, smokes ppd

- A1C 8.9% (down from 10.4%)
- B/P 139/76 AM BG 100, 2 hr pp 190
- Chol – TG 54, HDL 46, LDL 98
- GFR 47, UACR 34 mg/g

- Meds:
  - Insulin – 28 units basaglar insulin
  - Losartan 25mg – ARB for blood pressure
  - Metoprolol 50mg – Beta blocker
  - Glyburide 5mg BID - Sulfonylurea

Any special instructions?
Any meds missing?
Stop any meds?

A 67 yr old man, smokes ppd

- A1c 8.9% (down from 10.4%)
- B/P 139/76 AM BG 100, 2 hr pp 190
- Chol – TG 54, HDL 46, LDL 98
- GFR 47, UACR 34 mg/g

- Meds:
  - Insulin – 28 units basaglar insulin
  - Losartan 25mg – ARB for blood pressure
  - Metoprolol 50mg – Beta blocker
  - Glyburide 5mg BID - Sulfonylurea

Special instruction – sweating may indicate hypoglycemia

Any special instructions?
Any meds missing?
- Statin
- SGLT 2
- Aspirin

Stop any meds?

DiaBingo - N

N DPP demonstrated that exercise and diet reduced risk of DM by__%
N Average A1c of 7% = Avg BG of ____
N The goal is to eat 14 gms per 1000 cals of this nutrient a day
N Rebound hyperglycemia
N Scare tactics are effective at motivating behavior change
N Get LDL less than ____for most people with diabetes 40 years+
N Drugs that can cause hyperglycemia

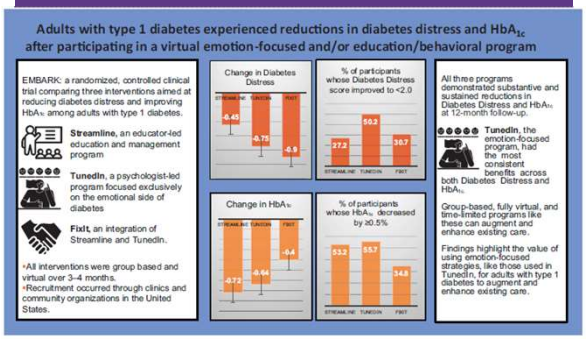
N 2/3 cups of rice equals _____ serving carbohydrate
N 1% A1c = how many points of blood sugar _____
N 1 gm of fat equal _____kilo/calories
N Metabolic syndrome = hyperinsulinemia, hyperlipidemia, hypertension
N Average American consumes 15 teaspoons of sugar a day.
N Medication derived from the saliva of the Gila Monster

ReVive 5 Steps

5 Steps to Address Distress Diabetes and Enhance Management (from EMBARK)

1. Assess diabetes distress
2. Begin a conversation to foster a new perspective
3. Consider different management choices that are not driven by tough thoughts and feelings
4. Optimize self-care based on personal choice and values—"find the expert within."
5. Make changes and plan for next steps.

Embark Trial



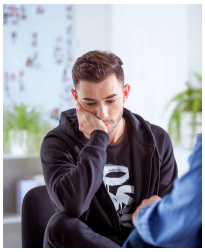
EMBARK: A Randomized, Controlled Trial Comparing Three Approaches to Reducing Diabetes Distress and Improving HbA_{1c} in Adults With Type 1 Diabetes. *Diabetes Care* 2024; dc232452. https://doi.org/10.2337/dc23-2452

Impact of Embark Trial

- The year I spent coaching study participants in the Embark Trial significantly changed my approach to diabetes self-management coaching.

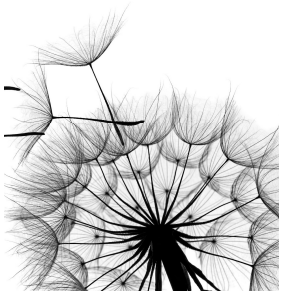
~ Coach Beverly

Embark Trial Takeaways



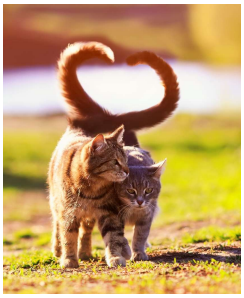
- Currently, diabetes education and management focuses on fostering self-management change.
  - This strategy assumes that people will become less distressed as they engage more effectively with their management.
- **Need a Shift - Make emotional considerations our priority.**
- The key to improving glycemic outcomes is to directly address the feelings, beliefs, and expectations that underlie diabetes distress and serve as barriers to management change.

Releasing the Brake



- This strategy recognizes that diabetes distress acts as a brake on the application of existing diabetes knowledge and skills.
- By releasing the diabetes distress brake through emotion-focused intervention, the negative cycle can be efficiently ended.

Embark Trial Takeaways



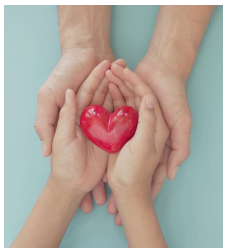
- **Better outcomes when using an integrated approach that combines an education and management with a diabetes distress emotion-centered approach.**
- This capitalizes on the strengths of each, leading to a more effective and efficient strategy for reducing diabetes distress and improving glycemic management.

Embark Trial – Emotions as Priority

- **I have finally given myself permission to make addressing the emotional aspects of diabetes a priority. ~Coach Beverly**

Trusting our Intuition

- As healthcare professionals, we tend to focus on problem-solving around lifestyle, medications, and glucose levels.
- The results of the Embark study confirm our intuition to prioritize addressing emotions to support individuals living with diabetes.
- **Let's reprioritize our checklist by assessing and addressing distress and move into the heart of providing effective diabetes care.**

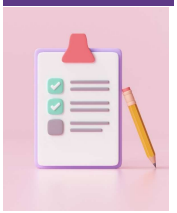


This emotion-based approach aligns with the 2025 American Diabetes Standards, which recommend annually assessing Diabetes Distress.

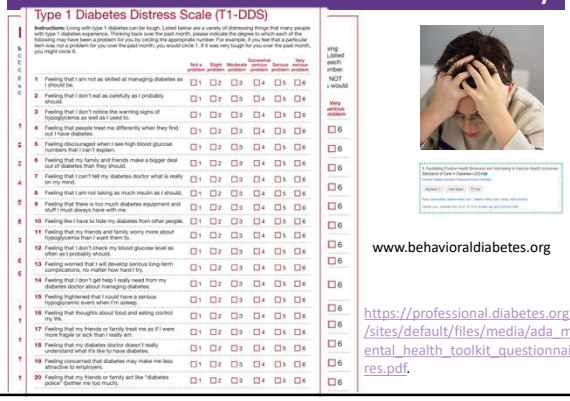
These important study results remind and prompt us to assess and address Diabetes Distress to improve diabetes care outcomes.

The ADA created a wonderful resource, the ADA Behavioral Health Toolkit, which houses diabetes distress and other screening tools for easy reference.

Emotion Based Approach and DD



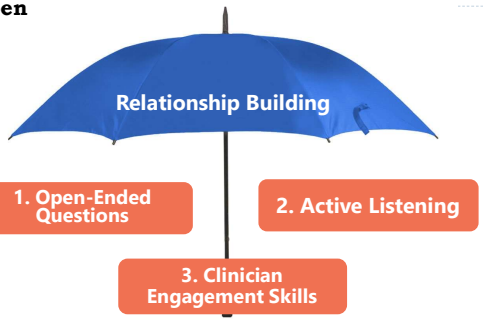
Diabetes Distress – Assess Annually


Type 1 Diabetes Distress Scale (T1-DDS)

www.behavioraldiabetes.org

https://professional.diabetes.org/sites/default/files/media/ada_mental_health_toolkit_questionnaires.pdf.

Relationship Building | Three Tools To Make It Happen

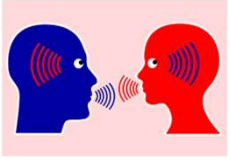


Used with permission from ReVive 5 Program; Larry Fisher, PhD & Susan Guzman, PhD

Conversational Tools You Can Use To Address DD In Your Practice

The goal is to help the PWD label, verbalize, share, consider, and evaluate these frequently unaddressed and often hidden feelings and thoughts about diabetes.

Building the relationship with conversational skills is the intervention!



Start with Open Ended Questions

Used with permission from ReVive 5 Program; Larry Fisher, PhD & Susan Guzman, PhD

Clinical Engagement Tools: Label & Address Feelings

Common feeling words:

- Sad
- Frustrated
- Scared/fearful
- Disappointed
- Angry
- Hopeless
- Defeated
- Ashamed/embarrassed
- Burned out

Used with permission from ReVive 5 Program; Larry Fisher, PhD & Susan Guzman, PhD

Having the Conversation

Review and summarize the story you hear:

"Do I have this right?"
"Is there anything missing?"

Then ask:

"How does all of this strike you?"
"Does any of this surprise you?"

Used with permission from ReVive 5 Program; Larry Fisher, PhD & Susan Guzman, PhD

Case Study with MR

- MR is 69 years old, lives alone, works in an office but is currently out of work and very stressed. Diabetes distress score is elevated in the areas of .
- Looking at her ambulatory glucose profile, the TIR is around 46-50% and she has no episodes of hypo.
- Insulin includes 30units glargine at bedtime and 10-15 of apidra with meals based only on what she is going to eat.

Case Scenario with MR

- MR wears a CGM, but only checks the app results a few times a day. They tell you,
- "I don't want to look at the device because the numbers are always bad".

- What do you say?

MR says

- The numbers always go up after I eat meals.

- What do you say now?

We ask MR

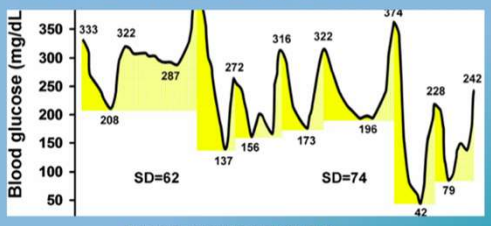
- Have you noticed if certain foods tend to increase your elevating your blood glucose?

- MR says "when I eat shrimp".

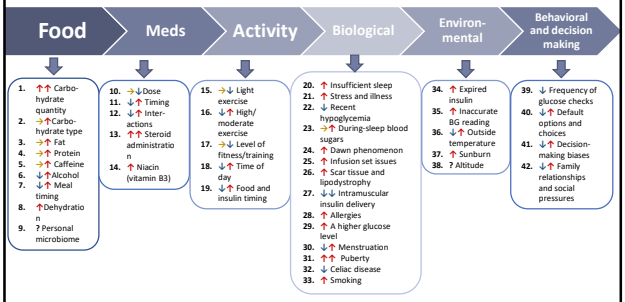
- What do you say then?

Blood Sugars with Diabetes

This is what a glucose pattern may look like in a person with type 1 diabetes. The body cannot control blood glucose levels without the correct insulin replacement.

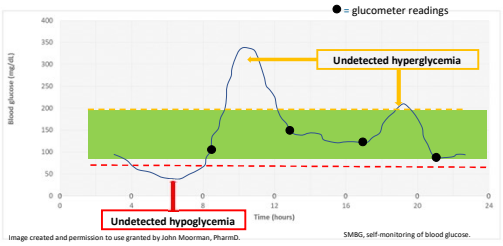


At least 42 factors affect glucose!



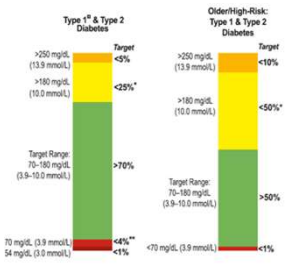
Adapted from Brown A. DiaTribe Learn: Making sense of diabetes... diatribe.org/42factors

BGM vs CGM



Time in Range

- Evaluate Time in Range (TIR)
  - Target 70-180 mg/dl
  - Target time *below* goal
    - Less than 70
    - Less than 54
  - Target time *above* goal
    - Above 180
    - Above 250

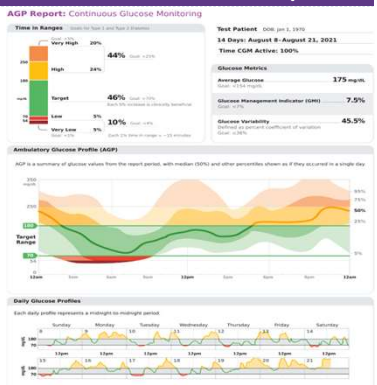


Battelino T, et al. *Diabetes Care*. 2019;42(8):1593-1603.

6. Glycemic Targets: *Standards of Care in Diabetes—2023*

Ambulatory Glucose Profile Report

- CGM key metrics
- AGP
- Daily tracings



Diabetes Distress Stories

Common events you will hear about:

- Scary or embarrassing lows
- Surprising highs
- Difficulty managing BG
- Eating challenges
- Managing all of the tech
- Situations with friends, family, colleagues
- Managing health care (feeling judged and misunderstood), insurance, etc.

Used with permission from ReVive 5 Program; Larry Fisher, PhD & Susan Guzman, PhD

Example of A More Helpful Expectation: From Perfectionism to "Healthy Good Enough"

Perfectionistic thinking: has 2 speeds, perfect or failure, not achievable for very long, exhausting, contributes to burnout

Healthy Good Enough

- Personalized
- Ambitious and realistic
- Allows for normal fluctuations, mistakes and experiments
- Sees small steps as valuable
- Focus is on efforts made, not numbers
- Forward looking: What now?

Used with permission from ReVive 5 Program; Larry Fisher, PhD & Susan Guzman, PhD

RT not sure what to tell partner

- RK has lived with type 1 diabetes for over 20 years. After a divorce, RT started surfing and dating.
- RK has told their partner they have diabetes but has not told them what to do in case of a low blood sugar emergency.
- RT asks about treatment options.
- How might you respond?

Having the Conversation

- Eliciting a diabetes story
- Listening for the major DD themes
- Three approaches to fostering a new perspective
  - Distinguish between thoughts/feelings & actions
  - Address inaccurate beliefs
  - Establish more realistic expectations
- Considering different management choices

- Open-ended questions (O)
- Reflecting feelings words (R)
- Summarizing (S)
- Normalizing (N)
- Active listening with empathy (E)

Hypoglycemia Conversation

- What is the story you are telling yourself? (O)
- It sounds like you are afraid that if you tell your boyfriend about your risk of low blood sugar, he might feel uncomfortable? Did I get that right? (R, S)
- That makes sense to me. (N)
- Would you be interested in exploring some newer treatment options for low blood sugar?
- What do you think would be the next best step? (O)

Create a Judgement Free Zone – Roll out the Carpet of Acceptance

There are no bad or good blood glucose numbers.
There is no cheating.
You are not failing at your diabetes.
It is not your fault you have diabetes.
Thank you for showing up today.

List of typical "Problem Causers."

Knowing the DD Story helps you anticipate the causes of BG problems

- Basal insulin dose or rates may need adjusting.
- Carb count accurate?
- Right meal carb ratio?
- Right correction bolus insulin?
- Timing of insulin dosing may need adjustment- insulin taken early or late.
- Type of food consumed affected glucose response (fats, protein, fiber).
- Effects of exercise and physical activity.
- 'Stacking' insulin boluses.
- Response to concerns about hypoglycemia.
- Stress: family, work, financial, etc.

FIVE M'S
FOR DIABETES SELF-MANAGEMENT


Mood


Meals


Movement


Medicines


Minutes

Based on 5 M Framework Tool by Funnell et al. www.DiabetesEd.net

The 5 M's

The 5 M's for Diabetes Self-Management Include:

- Mood – including emotions, diabetes distress, and physical stress
- Medicines – type and dose
- Movement – physical activity
- Meals – food, beverages, and portions
- Minutes – the timing of medicine, meals, movement, and monitoring
- Initially, facilitators explore the meaning of each of the 5 M's and continue to use them as a discussion framework in each session.

- The repetition of returning to the 5 M's each meeting provides participants with a way to organize and integrate diabetes information into their own lives.

Informed vs Wise Decisions

- Informed:
  - I know that tomatoes are a fruit.

- Wise
  - I know not to put tomatoes in my fruit salad.

Making the Wise Choice

- Wise choices consider and recognize the individual's values, preferences, needs, and wants.
- For example, if a person tells you, "I am going to cut out carbs to get my blood sugars under target," we would acknowledge that this might be an informed choice.
- "Yes, cutting out carbs will likely lower your blood sugars, but is it a "WISE" choice?"
- Does it match their values, preferences, needs, and wants? Or would cutting out carbs significantly decrease their life's pleasure and joy?

Insulin Duration and Stacking

- Some people may bolus in between meals if they see their glucose rising
- Duration of rapid insulin action is about 4 hours.
- Important to wait for the correction dose to work.
- Taking more insulin during that time, is called "stacking" the insulin and can lead to hypoglycemia.

"After eating, when I see my blood sugar rising, I keep bolusing to bring it down. Then I crash and I have to eat a ton of carbs to bring it up again."

Having the Conversation

- Eliciting a diabetes story
- Listening for the major DD themes
- Three approaches to fostering a new perspective
  - Distinguish between thoughts/feelings & actions
  - Address inaccurate beliefs
  - Establish more realistic expectations
- Considering different management choices

- Open-ended questions (O)
- Reflecting feelings words (R)
- Summarizing (S)
- Normalizing (N)
- Active listening with empathy (E)

Stacking Conversation

- What is the story you are telling yourself?
- It sounds like you may be *worried* you will get complications if your blood sugars go too high and so you are giving extra bolus insulin? (R)
- You're not alone, I have talked to lots of people who do the same thing. (N)
- It sounds like you want to work on avoiding low blood sugars due to stacking? (S) Is that right?
- I am curious. Next time you see your arrows pointing up and you want to give an extra bolus of insulin before 4 hours, what could be an alternate plan? (O)

Stacking is sometimes referred to as "rage blousing"

Be a Detective – What is the Issue?

- Put it all together: What do THEY think might be going on based on the DD Story?
  - Get as specific as possible.
  - This is a best guess – it might not be a correct guess, but it is a place to start.
  - Usually, the first guess may be correct in perhaps 50% of the cases, so be prepared to use this only as a place to start.

JR rides their bike for 1.5 hours twice weekly.

Limits carb intake to 30 gms daily to avoid weight gain.

Uses a pump and tries to manage glucose with basal insulin only.

Is reluctant to treat lows with carbs.

JR keeps getting low when bike riding

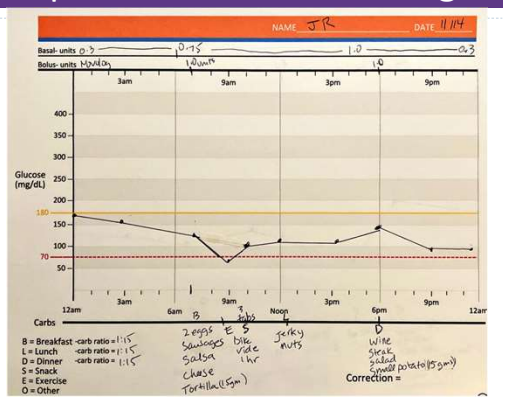
Over the past month, JR's blood sugar has dropped below 70 while bike riding at least 3 times.

What questions would help you support problem solving?

Adjustments for Activity

- **People may decide to:**
  - Adjust their basal insulin or bolus insulin
  - Adjust food intake in anticipation of activity
  - Set higher blood glucose goal before activity
- Assess and provide coaching to explore what approach works best for them.
- Consider spontaneous and planned activity.
- Options include:
  - Reducing bolus coverage for previous meal
  - Creating a temporary basal rate
  - Eating additional carbs before or during activity
  - Other?

Drops with Exercise – JR Log



Exercise Hypo – JR's Situation

JR Tells You

- Story – limiting my carbs will keep my blood sugars on target.
- I am worried about complications, so I try to avoid carbs, even with exercise.

You Explore

- Would you be willing to be present with that fear to try and keep blood sugars in a safe range during bike riding?
- Are there any other strategies that might work to keep glucose in a safe range during your bike ride?

ReVive 5 – Explore Problem & Identify Patterns

Problem solve and enhance glucose management

- Now that you have collected the data.
- Now that you have identified patterns.
- Now that you have identified how DD drives the problem.
- Now you are ready to try an experiment.

Help the person decide what change(s) they can make to address the problem

JR Decides and Makes a Plan

Make sure that the change they make is VERY specific.

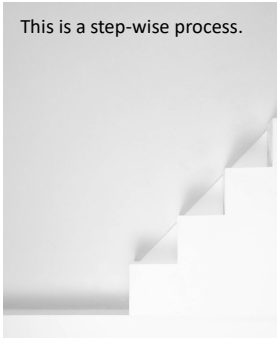
The clearer and more specific the change, the more easily evaluated.

- I will decrease my basal insulin 1 hour before and during my bike ride or
- I will eat an extra 15gms of carb at meal before my bike ride days.
- I will eat 15 gms of carb if my glucose drops less than 70 during my bike ride.

Helping People Succeed

- The change has to be achievable – something they actually can do.
- Remind them that feelings and action are not the same thing.
- The first change may not fix the problem, but it helps people discover what to do next.
- The first change may point them in the right direction, but it still might not be enough change.

This is a step-wise process.



Checking in with JR 2 weeks later

You Say / Ask

- Thank you for keeping logs on your exercise days.
- Did you notice your DD story showed up?
- Were you able to try any of the experiments?
- Did you discover anything new?

JR Responds

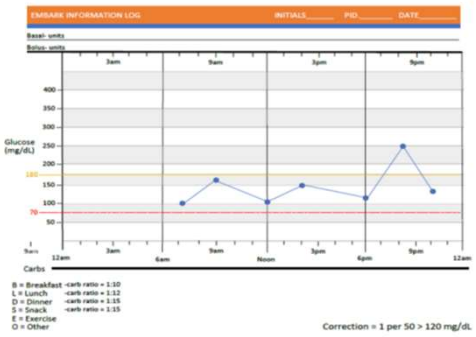
- Yes, I noticed my worry as I prepared for my ride.
- I put my pump on exercise mode when I started my ride. I got a little low at first, had some glucose tabs, and then things stabilized.
- Next time, I will start with a higher BG plus put my pump on exercise mode.

Setting Up Experiment/ Taking Action

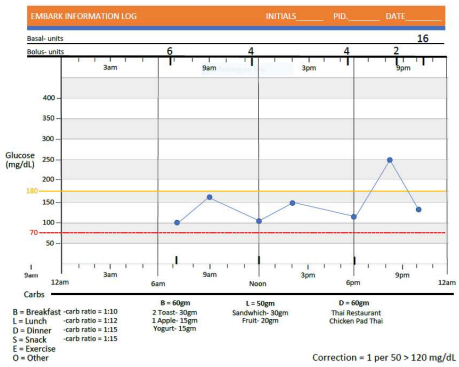
- Change experiments need to be time limited (not forever) – this is only an experiment – try it out for 3 days and see what happens.
- They could realize that it actually isn't an issue or maybe it is something different.

- Based on JR results:
  - Make a small change (exercise mode > higher BG)
  - Realize, that the story and tough feelings can be major barrier to change. (It is scary, but I can feel worried and still try these new strategies)
  - Discover an unexpected issue (maybe basal rate is too much).

What is happening here?



Diabetes Detectives



RT Loves Eating Out

- RT loves to eat dinner out with their friends 2-3 times a week.
- However, blood sugars always seem to go above target on those evenings.
- Want to have improved time in range to feel better, worry less and enjoy time with friends.
- Story- I am such a failure, my blood sugars are always going too high. Makes me not even want to try.
- Action: I will tolerate these feelings and I will look up carb content of food to try and figure out how much insulin I actually need.

RT Sets up Experiment/ Takes Action

Steps

- Make a small change
- Realize, that the story and tough feelings can be major barrier to change.
- Discover an unexpected issue

RT Changes

- Look up carbs on app/website.
- Ask her friends for support
- Asking for help is hard, but I think it will help.
- See how drinking wine with dinner affects BG

Checking in with RT 2 weeks later

You Say / Ask

- Thank you for keeping logs on your eating out days.
- Did your DD Story show up?
- Were you able to try any of the experiments?
- Did you discover anything new?

RT Responds

- We went to the same restaurant 2 times in the same week. My friends helped me figure out the carbs in my favorite dish, but the first night, it still went high. I noticed the DD story of feeling like a failure.
- A few nights later, I tolerated my DD, ordered the same dish, and increased my bolus by 2 units. My blood sugar was right on track!

Checking in with RT 2 weeks later

You Say / Ask

- I know you also mentioned you wanted to see how wine affected your blood sugars.
- Did you discover anything new?

RT Responds

- I didn't have a chance to check that out yet. But next time, I am going to eat the same dish, take the same amount of insulin and add have a glass of wine to see what happens.
- I see that I need to keep challenging myself to not give in to feeling like a failure and keep making new choices.

Avoid and Lean Into

- **AVOID: Pressure, fix, or control.**
- We are careful to avoid forced solutions or controlling language. Our job is to help the person with diabetes find their own answers and solutions.
- **Let's stop "Shoulding" on people**.
- It's time to let go of terms like "You must, you should, you have to, it's better, it's important, do it for me" since they fall under the category of "controlling motivation"—which can be hurtful and lead to the individual becoming defensive or shutting down.
- **Ditch the scare tactics too!**

- Lean into - A person-centered approach energizes individuals to take the lead in managing their condition, in step with their providers and supporters.

ReVive 5 Program – Fresh Perspective

- To help look at things differently.
- To gain a new perspective.
- To get out of a blood glucose rut.

With this new perspective, we partner with the person with diabetes, who is the expert in their lives, to figure out next steps.

ReVive 5 Steps

5 Steps to Address Distress Diabetes and Enhance Management

1. Assess diabetes distress
2. Begin a conversation to foster a new perspective
3. Consider different management choices that are not driven by tough thoughts and feelings
4. Optimize self-care based on personal choice and values—"find the expert within."
5. Make changes and plan for next steps.

Thank You

- Questions?
- Email: info@diabetesed.net
- Web: www.diabetesed.net
- Phone 530-893-8635

Diabetes Education SERVICES