2024 ADA Standards of Care Update - Back to the Basics and Beyond 2024

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

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PDF & Resources

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www.DiabetesEd.net (search Hawaii)

Hawaii ADCES Coordinating Body

Hawaii Chapter President Naomi Fukuda, APRN, BC-ADM, CDCES
Camlyn Masuda, PharmD, CDCES, BCACP & Kourtney Inoue

Speakers & Agenda

SPEAKERS:

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

Dr. Alan Parsa, Endocrinologist

Agenda:

08:00 – 9:45 am ADA Standards of Care Dissected
09:45 am – 10:15 am Break and visit exhibitors
10:15 am – 11:45 am Goals of Care for Diabetes – the ABC's'
11:45 am – 1:00 pm Lunch and visit exhibitors
1:00 pm – 2:15 pm Medications to address hyperglycemia and renal disease
2:15 pm – 2:30 pm Break and visit exhibitors
2:30 pm – 3:30 pm Addressing Diabetes Distress Using the ReVive 5 Approach to Untangle CGM Data
3:30 pm – 4:30 pm Insulin Pumps and Sensors Dr. Alan Parsa

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:

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

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 occupational drivers
- In work settings
- In Correctional Institutions

FREE

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

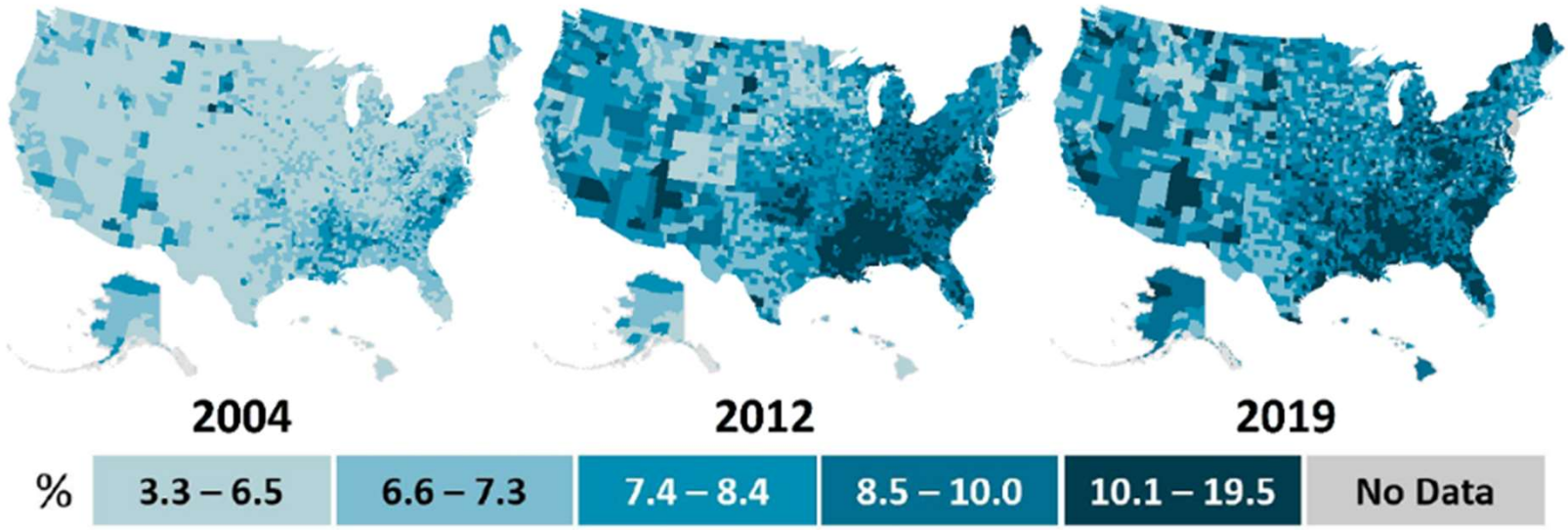
- According to the CDC, what best describes the current prevalence of prediabetes and diabetes in the U.S.?

a. 30% of people above the age of 20 have type 2 diabetes.
b. The rate of type 1 and type 2 diabetes have tripled since 2010.
c. A total of 50% of people have prediabetes or diabetes.
d. 1 out of 2 persons above age 20 have prediabetes.

Type 2 Diabetes in America 2024

- 11.3% with Diabetes - 37 million adults
  - 23% don't know they have it
- 38% with Prediabetes – 96 million

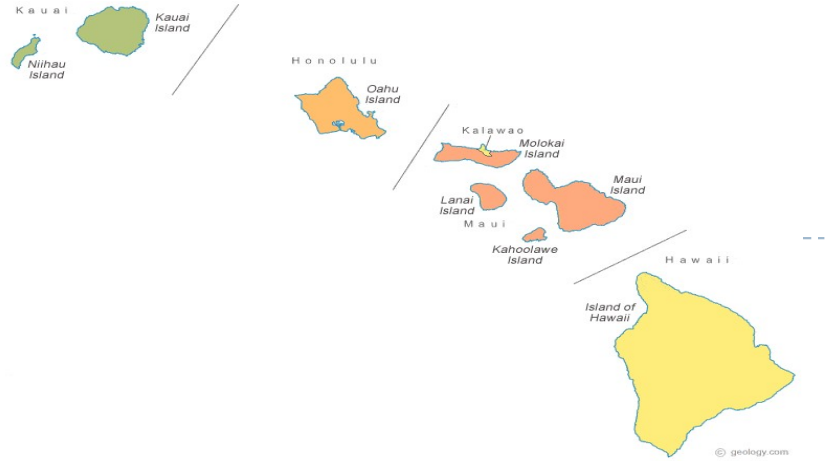
Figure 3. Age-adjusted, county-level prevalence of diagnosed diabetes among adults aged 20 years or older, United States, 2004, 2012, and 2019



Data sources: US Diabetes Surveillance System; Behavioral Risk Factor Surveillance System.

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

Diabetes in Hawaii



Hawaii's diabetes epidemic:

Approximately **154,365 people in Hawaii**, or 13.1% of the adult population, **have diabetes**.

- Of these, an estimated **46,000 have diabetes but don't know it**, greatly increasing their health risk.
- In addition, **442,000 people in Hawaii**, 41.5% of the adult population, **have prediabetes** with blood glucose levels higher than normal but not yet high enough to be diagnosed as diabetes.
- **Every year** an estimated **8,000 people in Hawaii are diagnosed with diabetes.**

Diabetes and prediabetes cost an estimated $1.5 billion in Hawaii each year.

The serious complications include heart disease, stroke, amputation, end-stage kidney disease, blindness – and death.

13% with diabetes

About 1/3 of people don't know they have it

41% with Prediabetes

Costs Hawaii $1.5 billion a year

American Diabetes Association.

ASIAN AMERICAN
NATIVE HAWAIIAN
& PACIFIC ISLANDER
AANHPI INITIATIVE™

Asian Americans, Native Hawaiians and Pacific Islanders are at greater risk for type 2 diabetes at any weight.

YOU COULD BE AT RISK TOO.

If you can check one of these boxes, you are at risk for type 2 diabetes.

- I am of Asian descent
- I am of Hawaiian descent
- I am of Pacific Islander descent
- I am overweight/obese
- I do not exercise regularly
- I am over 45 years old
- I have family members with diabetes

WHAT IS DIABETES?

Diabetes is a disease that affects every part of your body. If untreated, diabetes can lead to heart attack, stroke, kidney disease, blindness, amputations and death.

The good news is you can prevent or delay getting type 2 diabetes by eating healthy and getting regular physical activity.

Ask your doctor if you should be screened for type 2 diabetes.

"I couldn't believe it when I was diagnosed with type 2 diabetes. I was at risk even though I've never been overweight."

STOP DIABETES.

The American Diabetes Association is committed to supporting Asian Americans, Native Hawaiians and Pacific Islanders in preventing and living with diabetes.

Call 1-800-DIABETES (1-800-342-2383) or visit diabetes.org for more information about diabetes and to get involved.

Native Hawaiian & Pacific Islander Adults with Diabetes

Age-adjusted percentage of persons 18 years of age and over with diabetes, 2018		
Population	**Percent**	**Population / White Ratio**
White	7.9	--
Native Hawaiian/Pacific Islander	15.2	1.9
Native Hawaiian	14.2	1.8
Pacific Islander	17.7	2.2
Samoan	22.1	2.8
Guamanian or Chamorro	14.8	1.9
Other Pacific Islander	15.8	2.0

Source; CDC, 2017. Health Conditions and Behaviors of Native Hawaiian and Pacific Islander Persons in the United States, 2014. Vital and Health Statistics, Series 3, No. 40. Table 9.
https://www.cdc.gov/nchs/data/series/sr_03/sr03_040.pdf

OMH
U.S. Department of Health and Human Services
Office of Minority Health

Office of Minority Health Resource Center
Toll Free: 1-800-444-6472 / Fax: 301-251-2160
Email: info@minorityhealth.hhs.gov

Death Rates from Diabetes In Hawaii

Death Rates

Age-adjusted diabetes death rates per 100,000 (2018)			
	Non-Hispanic Native Hawaiian/Pacific Islander<	**Non-Hispanic White**	**Non-Hispanic Native Hawaiian/Pacific Islander / Non-Hispanic White Ratio**
Male	56.5	24.3	2.3
Female	40.1	14.3	2.8
Total	48.1	18.9	2.5

Source: CDC 2021. National Vital Statistics Report. Vol. 69, No. 13. Table 10. https://www.cdc.gov/nchs/data/nvsr/nvsr69/nvsr69-13-508.pdf [PDF | 2.05MB]

Risk Factors

There are several risk factors related to diabetes. Some of these risk factors are:

Obesity and Overweight - See Obesity and Native Hawaiians/Pacific Islanders
Hypertension - See Heart Disease and Native Hawaiians/Pacific Islanders
High Cholesterol - See Heart Disease and Native Hawaiians/Pacific Islanders
Cigarette Smoking - See Heart Disease and Native Hawaiians/Pacific Islanders

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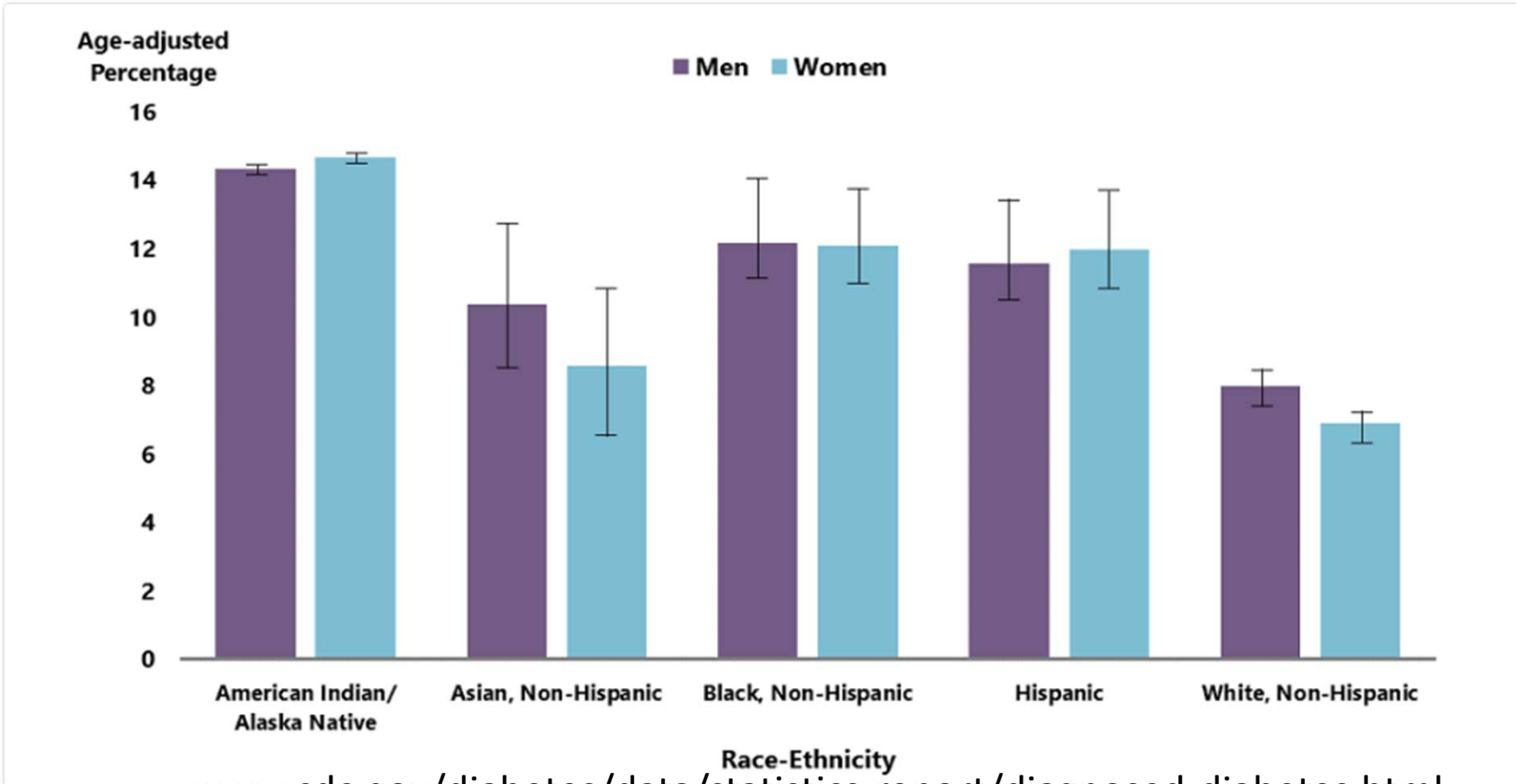
Diabetes Prevalence by Ethnic Group

- 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

1. Improving Care and Promoting Health in Populations

- "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:
  - mortality, morbidity, health, and functional status
  - disease burden
    - (incidence and prevalence)
  - behavioral and metabolic factors
    - (exercise, diet, A1C, etc.)

ADA Standards 2024

1. Improving Care and Promoting Health in Populations: *Standards of Care in Diabetes—2024*

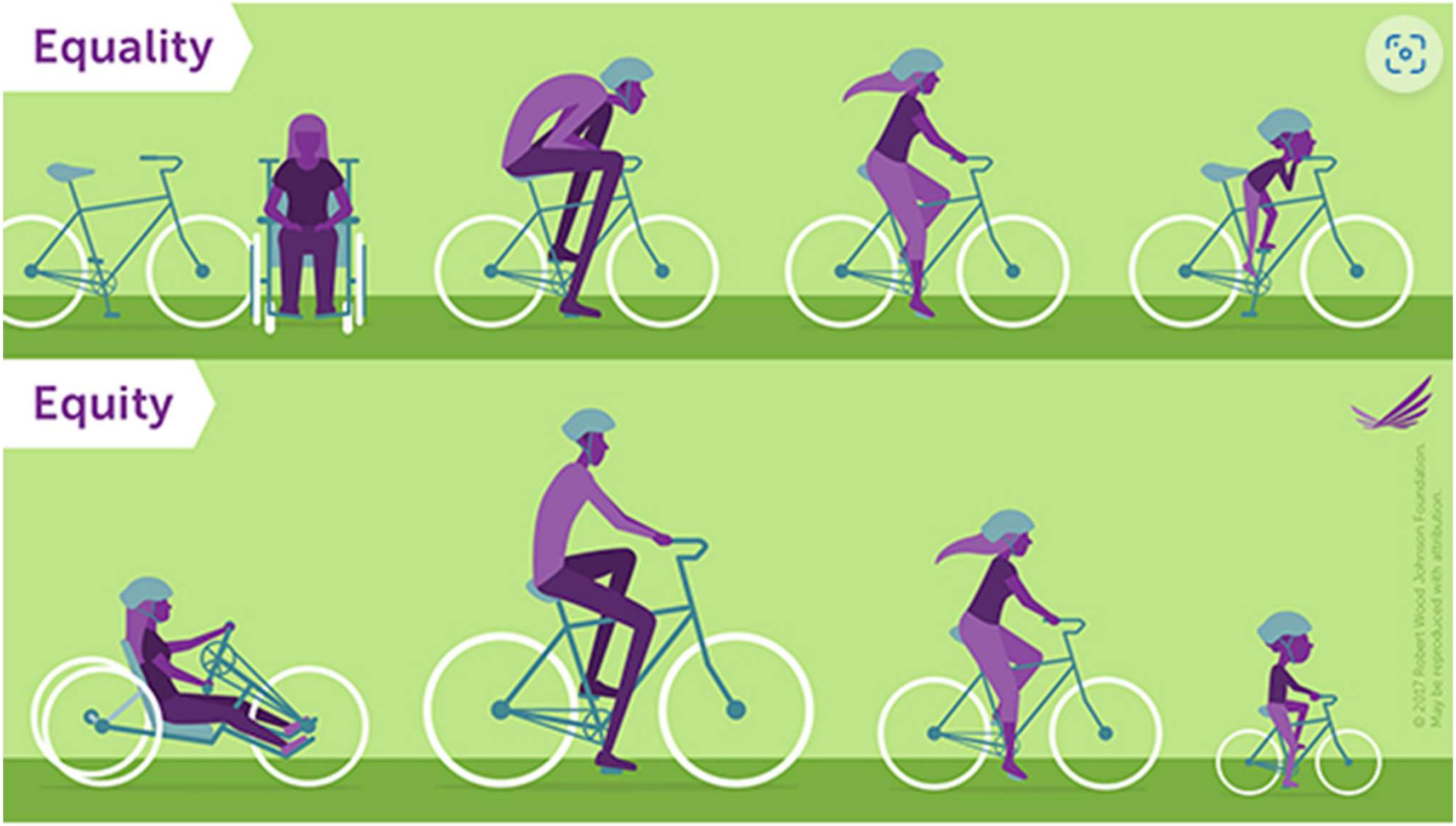
American Diabetes Association Professional Practice Committee

Abstracts | View article | PDF

Topics: chronic care, chronic disease, food insecurity, guidelines, health personnel

Diabetes Care December 2023, Vol.47, S11-S19. doi:https://doi.org/10.2337/dc24-S001

Equality vs Equity

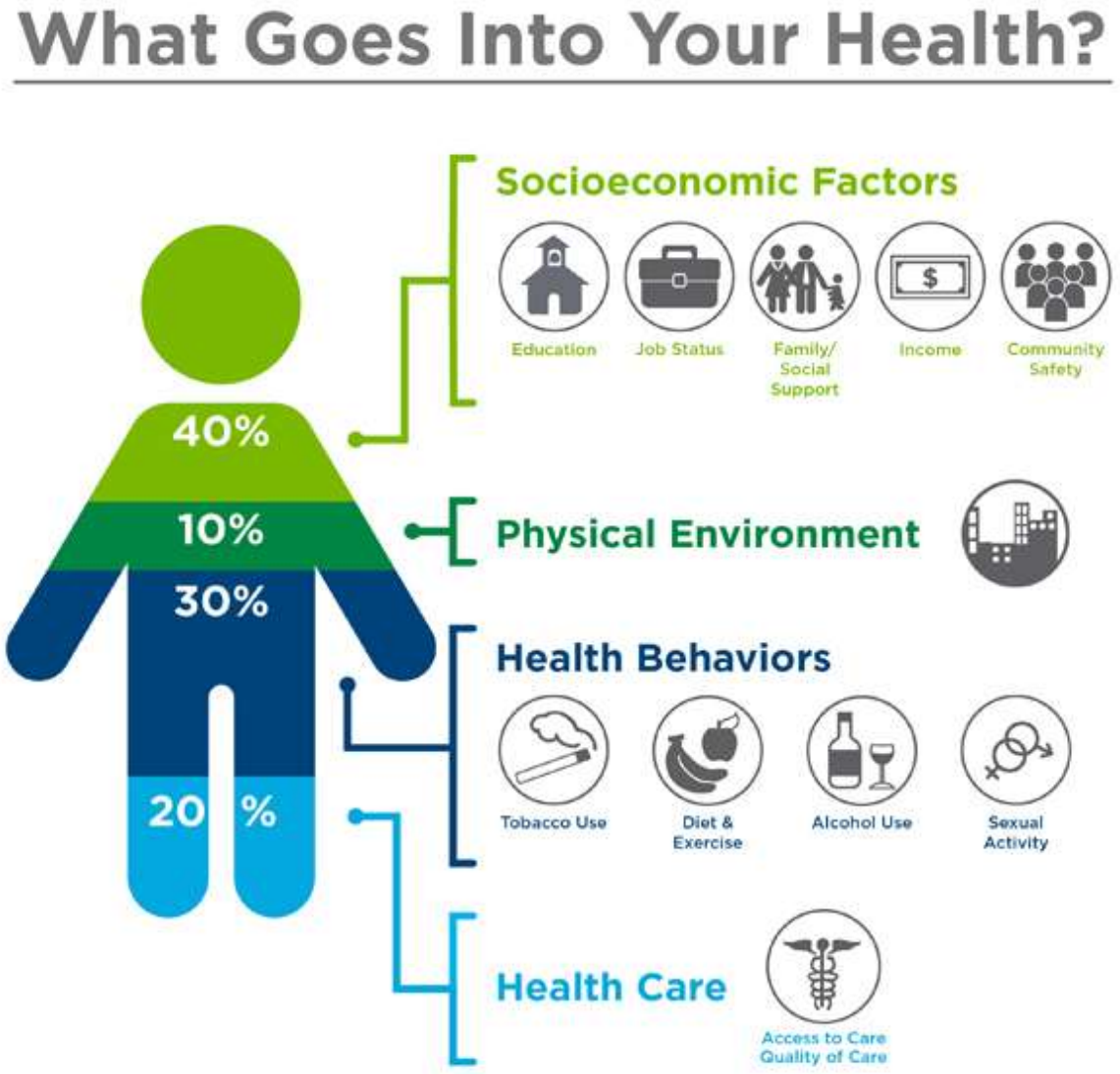


Design and deliver diabetes care with goal of **health equity** across all populations.

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.



Source: Institute for Clinical Systems Improvement, Going Beyond Clinical Walls: Solving Complex Problems (October 2014)

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

5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: *Standards of Care in Diabetes—2024* FREE

American Diabetes Association Professional Practice Committee

Social Determinants of Health

- The conditions in which people:
  - Play
  - Live
  - Work
  - Learn
  - Pray

Directly affects their health risks and outcome

AADE Population Health & Diabetes Educators Evolving Role 2019

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.

1. Improving Care and Promoting Health in Populations: *Standards of Care in Diabetes—2023* FREE

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.

1. Improving Care and Promoting Health in Populations: *Standards of Care in Diabetes—2024* FREE

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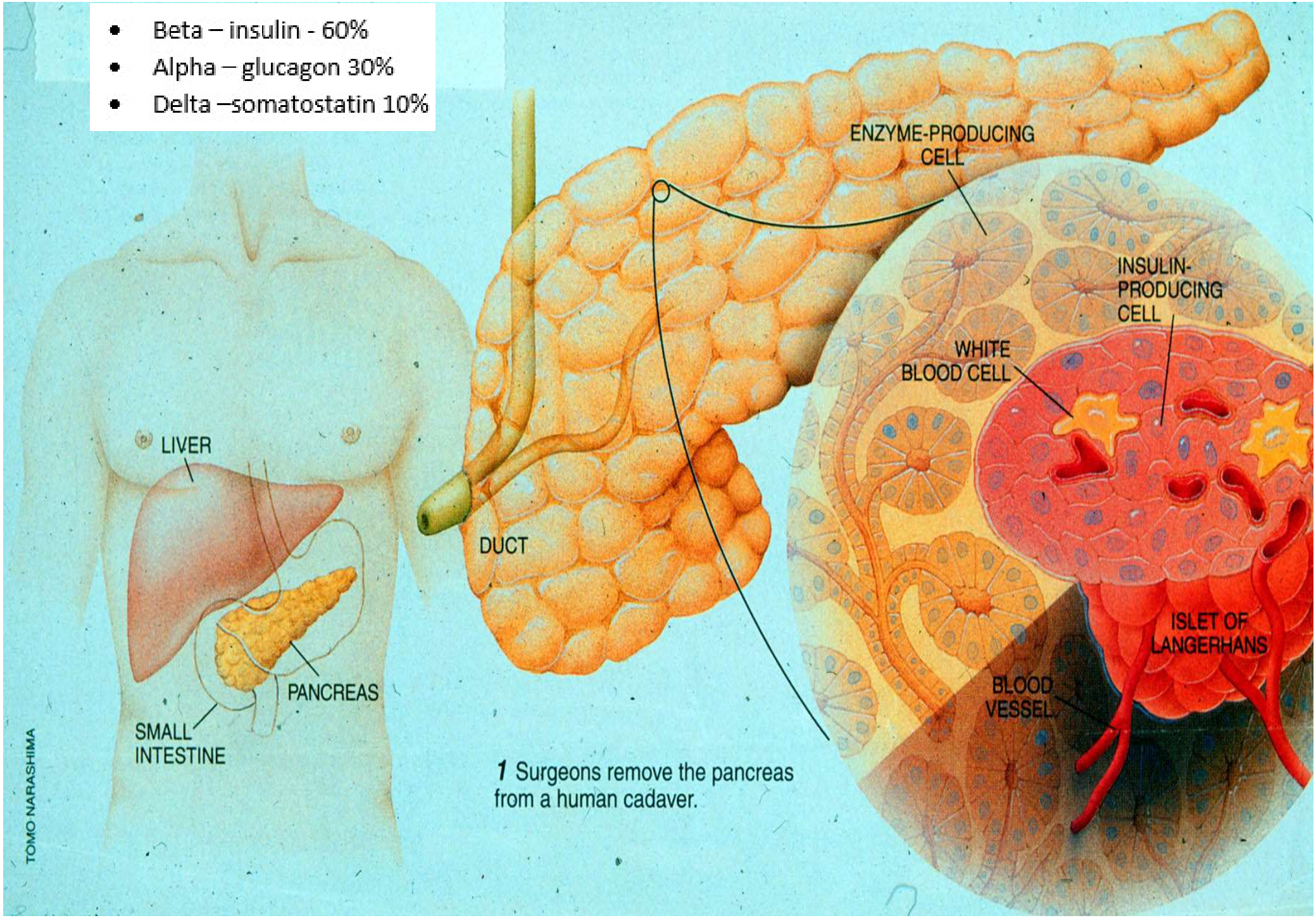
- Beta – insulin - 60%
- Alpha – glucagon 30%
- Delta –somatostatin 10%



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 2024 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
- *PreDiabetes
- History of heart disease
- *Taking high risk meds; antiretrovirals, 2nd generation antipsychotics or steroids
- History of pancreatitis

2. Diagnosis and Classification of Diabetes: *Standards of Care in Diabetes—2024* FREE

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Second-Generation Antipsychotic Meds and Diabetes Risk

- People taking these meds require frequent monitoring due to increased risk of hyperglycemia and other metabolic effects.
- There is a range of effects across second-generation antipsychotic medications;
  - Olanzapine, haloperidol, clozapine, quetiapine, and risperidone tend to have *more* metabolic effects.
  - Aripiprazole and ziprasidone tend to have *fewer* metabolic effects.
  - It taking these agents, screen for prediabetes or diabetes at baseline, rescreen at 12–16 weeks after medication initiation, and screen annually thereafter ADA 2024

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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)

2. Diagnosis and Classification of Diabetes: *Standards of Care in Diabetes—2024* FREE

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RECOMMENDATIONS FOR DIAGNOSIS AND CLASSIFICATION OF DIABETES – 2024

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

DIABETES TYPE	RISK FACTORS and FREQUENCY OF SCREENING and TESTING FOR DIABETES
Type 1	Screen for presymptomatic type 1 diabetes, by testing autoantibodies to insulin, GAD, islet antigen 2, or ZnT8 is recommended. Also test antibodies for those with type 1 phenotypic risk (younger age, ketoacidosis , etc.)
Type 2	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 with 1 or more risk factors: • History of cardiovascular disease • First or second degree relative with diabetes • HDL ≤ 35 mg/dl or triglyceride ≥ 250 mg/dl • If taking antipsychotic, antiretroviral meds* • Other conditions associated with insulin resistance (PCOS, Acanthosis Nigricans) • High risk ethnicity (African American, Latino, Native American, Asian American, Pacific Islanders) • Physical inactivity • History of GDM (repeat test at least every 3 years) • Hypertension ≥ 130/80 or on therapy for HTN • A1c ≥ 5.7% or Impaired Fasting Glucose (test yearly) 3. If results normal, repeat test at a minimum of 3-year intervals or more frequently based on risk status. 4. *Screen people with HIV, exposure to high-risk medicines, history of pancreatitis and re-check annually.

DiabetesEd.net Cheat Sheets – See appendix in back of syllabus

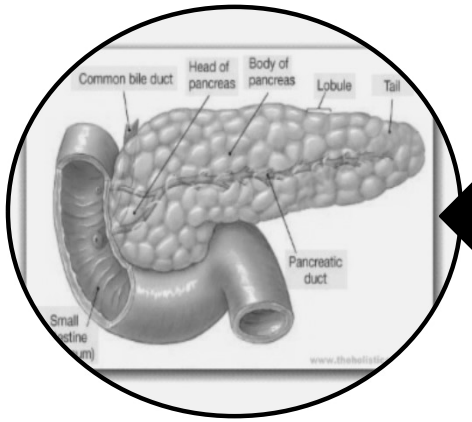
TESTS TO DIAGNOSE DIABETES - TABLE 2

STAGE	For all the below tests, in the absence of unequivocal hyperglycemia, Confirm results by repeat testing.			
	A1C *NGSP certified & standardized assay*	**Fasting* Plasma Glucose (FPG)** **No intake 8 hrs.*	**Random Plasma Glucose**	**Oral Glucose Tolerance Test (OGTT) 75-g** (Carb intake of ≥ 150 g/day for 3 days prior to test.)
Diabetes	A1C ≥ 6.5%	FPG ≥ 126 mg/dl	Random plasma glucose ≥ 200 mg/dl plus symptoms[1] [1]Random = any time-of-day w/out regard to time since last meal; symptoms include usual polyuria, polydipsia, and unexplained wt. loss.	Two-hour plasma glucose (2hPG) ≥ 200 mg/dl
Prediabetes	A1C 5.7 – 6.4%	Impaired Fasting BG (IFG) = FPG 100-125 mg/dl		Impaired Glucose Tolerance (IGT) = 2hPG 140 -199 mg/dl
Normal	A1C < 5.7%	FPG < 100 mg/dl		2hPG < 140 mg/dl

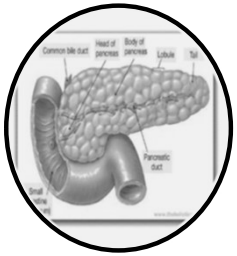
Poll Question 2

- 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



Yes!



NO

Healthy

FBG <100

Random <140

A1c <5.7%

Prediabetes

FBG 100-125

Random 140 - 199

A1c ~ 5.7- 6.4%

~ 50% working pancreas

Diabetes

FBG 126 +

Random 200 +

A1c 6.5% or +

~ 20% working pancreas

Development of type 2 diabetes happens over years or decades

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?

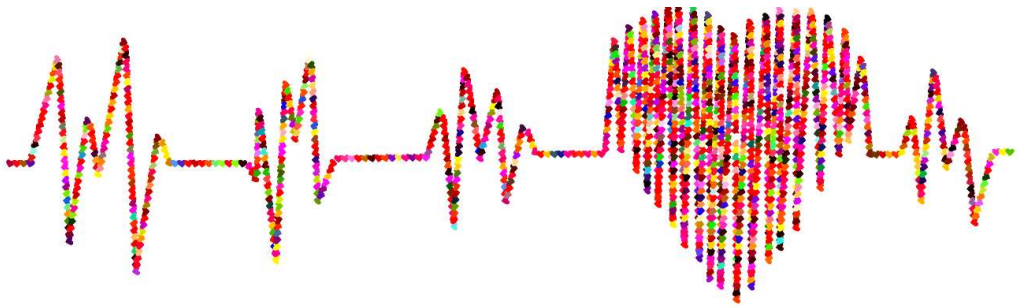
3. Prevention or Delay of Diabetes and Associated Comorbidities: *Standards of Care in Diabetes—2024*

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
  - Should be covered by third-party payers,
  - Address inconsistencies in access
- Screening guidelines for people with Type 1



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

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—2024*

3. Prediabetes Pharmacologic Intervention

- No FDA approved med for prevention (off label)
- Consider Metformin Therapy for Prediabetes
- Especially for ages 25-59
  - BMI of 35+
  - If A1c is ~6.0 or FPG is 110mg/dL
  - Women with history of GDM
- Monitor B12 level (esp with neuropathy or anemia)

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

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

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 (Avandia), 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 (Avandia)
    - Dosing: 4-8 mg daily

- **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

Thiazolidinediones "TZDs" • Increases insulin sensitivity	pioglitazone (Actos) rosiglitazone (Avandia)	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%

Quick Question 4

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

a. Hold metformin if your blood glucose is below 80 mg/dl
b. If you forget to take metformin before the meal, hold the dose
c. Metformin can harm kidneys
d. Avoid Metformin if eGFR is less than 30

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

Remember by Joy Harjo – Poet Laureate

- Remember the earth whose skin you are:
  red earth, black earth, yellow earth, white earth, brown earth, we are earth.

- Remember the plants, trees, animal life who all have their tribes, their families, their histories, too. Talk to them, listen to them. They are alive poems.

- Remember the wind. Remember her voice. She knows the origin of this universe.

- Remember you are all people and all people are you.
  Remember you are this universe and this universe is you.
  Remember all is in motion, is growing, is you.
  Remember language comes from this.
  Remember the dance language is, that life is.
  Remember.

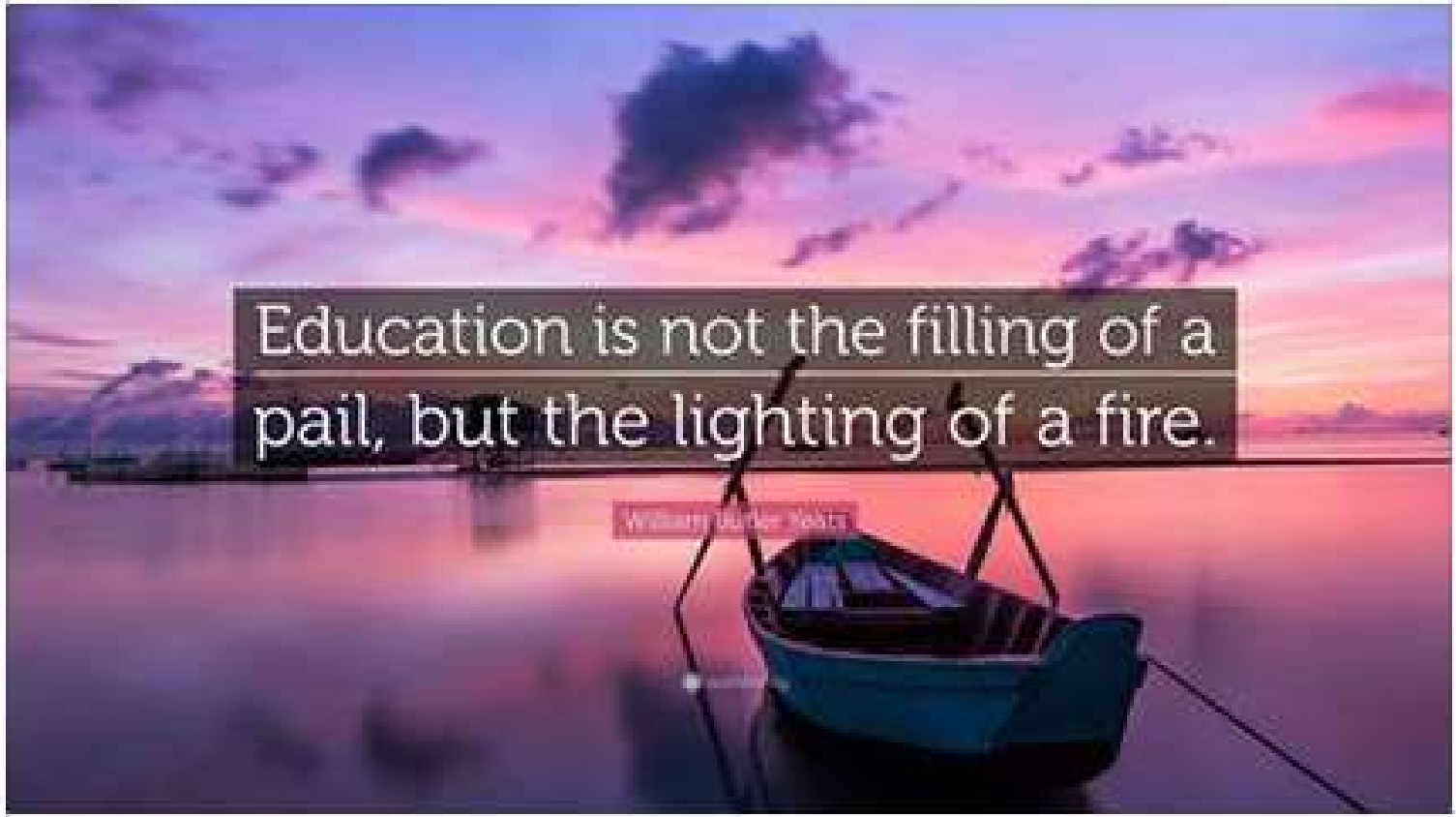
We are all connected

Person Centered Care

- Emphasize that a collaboratively developed plan improves well-being and outcomes.
- Provides care that is respectful and responsive to the individuals preferences, needs and values.
- Ensuring that the person's values guide all clinical decisions

Recognizes the expert within. Goal is to improve outcomes and encourage self-management for the long run.

Let’s meet people where they are at.



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.

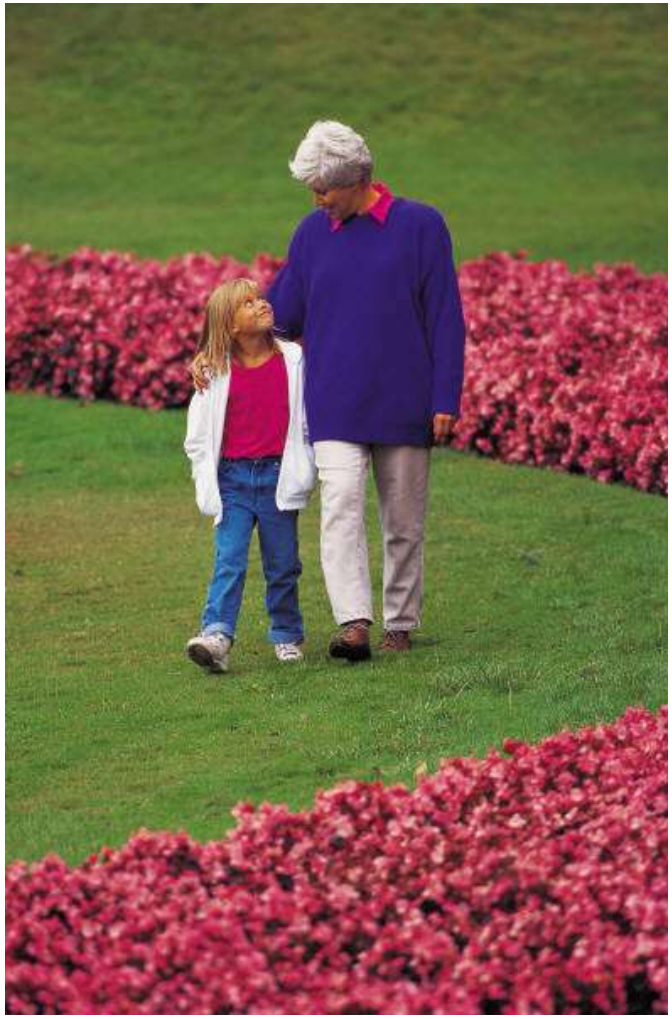
Poll Question 5

JR's mom has type 1 diabetes and JR's dad has type 2 diabetes. JR is 28 years old and in the emergency room with a glucose of 482 mg/dl. Besides checking glucose, ketones and A1C levels, which of the following lab test can be used to determine if someone has autoimmune diabetes?

1. Endogenous insulin titer
2. Glutamic Acid Decarboxylase
3. Beta cells auto antibodies
4. Langerhan's antibody

How do we know someone has Type 1 vs Type 2?

- Type 1 - Positive antibodies
  - GAD - glutamic acid decarboxylase (primary)
  - IA2 - islet antigen 2, or
  - ZnT8 - zinc transporter 8
- Can also check C-peptide levels to determine endogenous insulin production
- Younger people develop quickly
- Older people take longer to develop
- "misdiagnosis is common and can occur in ~40% of adults with new type 1 diabetes"



2. Diagnosis and Classification of Diabetes: *Standards of Care in Diabetes—2024* FREE

American Diabetes Association Professional Practice Committee

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

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Diabetes Care, June 2023

Type 1 Diabetes Features?

- 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.

CONSENSUS REPORT | OCTOBER 18 2021

The Management of Type 1 Diabetes in Adults. A Consensus Report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD) FREE

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

Type 1 Diabetes Progression

	Stage 1	Stage 2	Stage 3
Characteristics	• Autoimmunity	• Autoimmunity	• Autoimmunity
	• Normoglycemia	• Dysglycemia	• Overt hyperglycemia
	• Presymptomatic	• Presymptomatic	• 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—2024* FREE
American Diabetes Association Professional Practice Committee

3. Prevention or Delay of Diabetes and Associated Comorbidities (for Preclinical Type 1 Diabetes)

- Positive Antibodies with Prediabetes:
  - A1c 5.7 – 6.4% or fasting BG 100 -125mg/dl
- Action:
  - Screen A1C every 6 months
  - 75- OGTT every year
  - Modify screening based on antibodies and glycemic metrics.
  - May benefit from CGM to monitor progression

T1D Risk Screening

Offered at no cost to relatives of people with T1D, TrialNet risk screening detects the disease in its earliest stages, so you can take steps to try to change the course of the disease.

Trialnet.org

Type 1 & Lifestyle Prevention

- Observational studies in those with antibodies, shed light on factors that ***increase*** β-cell demand:
  - Less physical activity
  - Consuming higher glycemic index foods
  - Sugar intake.
- Factors that **reduced risk** of progression from TEDDY study:
- Daily minutes spent doing vigorous physical exercise.
- More info needed

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

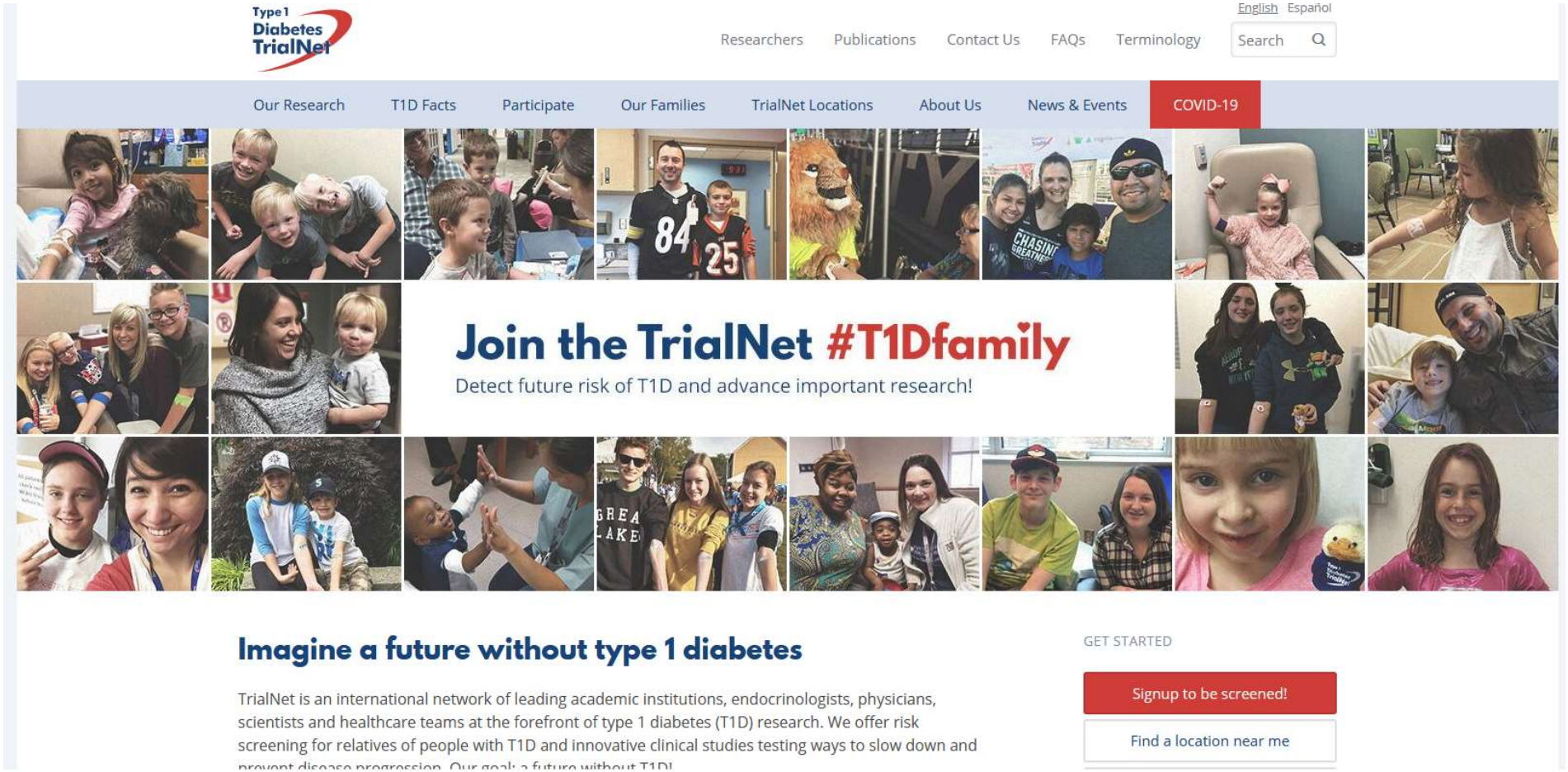
Pharmacologic Intervention to Delay Symptomatic Type 1 (in Stage 2)

- 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

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

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



Quick Question 6

- **Question:** LT has just been diagnosed with stage 2, type 1 diabetes. They have 2 positive antibodies and their blood sugars are slightly elevated. They ask you if they are a candidate for "that therapy" that can protect their beta cells and slow progression of type 1 diabetes. **What is the most accurate response?**
  - Unfortunately, you are not a candidate, since you already have 2 positive antibodies.
  - Let's talk to your provider about the possibility of starting Teplizumab therapy.
  - With your blood sugar elevation, the best early intervention is insulin therapy.
  - Since you are already in stage 2, the monoclonal antibody therapy won't be effective.

Miracle of Insulin

Patient J.L., December 15, 1922

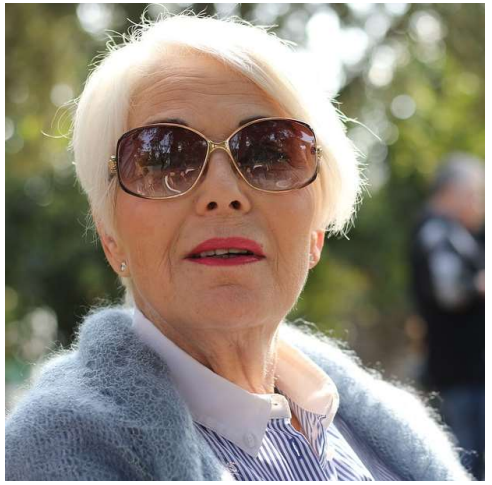
February 15, 1923

Medalist Study – Harvard Joslin Diabetes Center

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

What kind of Diabetes?

- 58 yr old, 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 each meal
  - Glargine 28 units at bedtime
  - Metformin 500mg TID
- What tests would you recommend?



25% of ind's with Type 1 also have type 2 diabetes.

ADA Post Grad, 2010

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

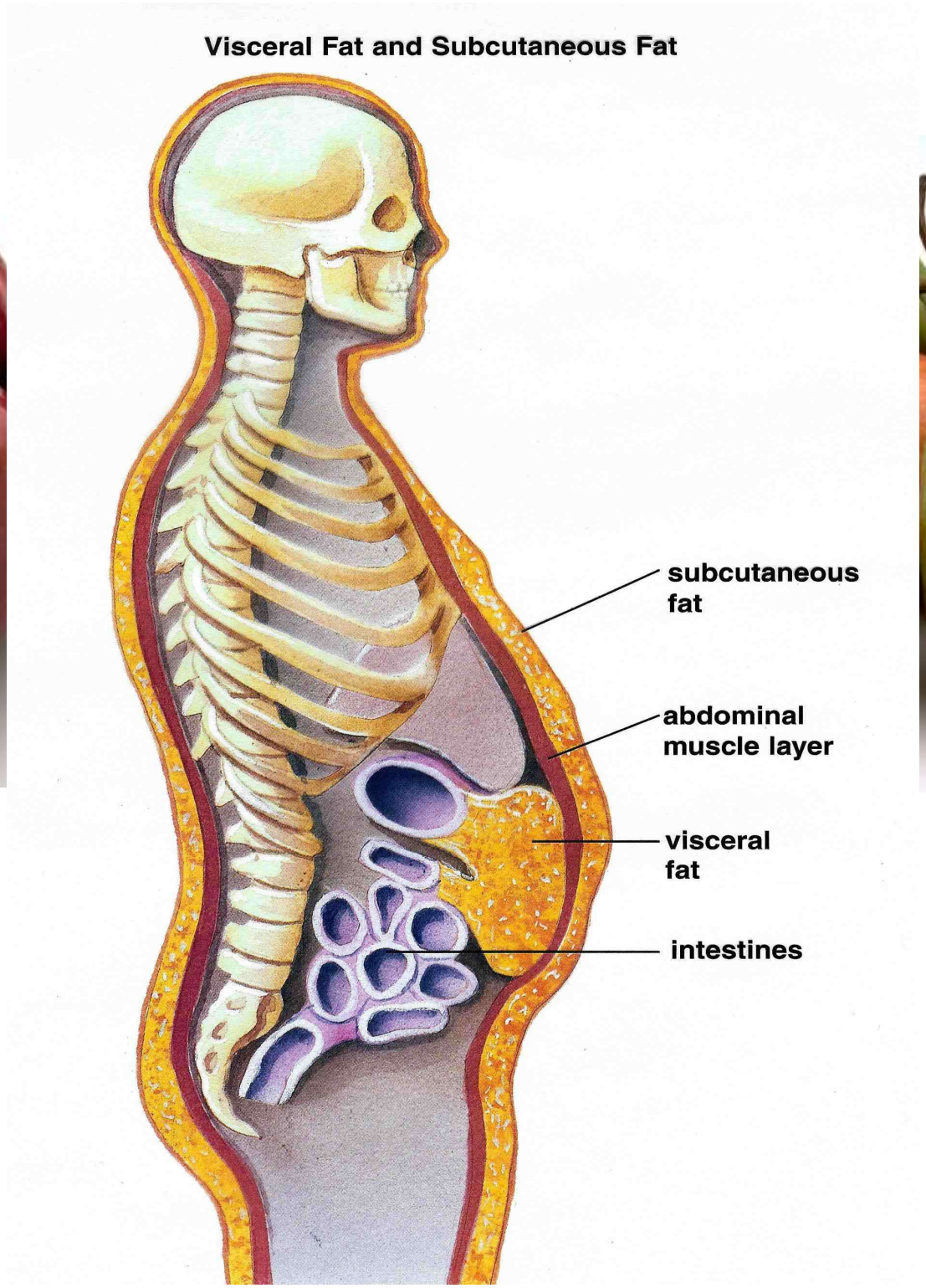
Patti Labelle

"divabetic"

“I have diabetes, it doesn’t have me”

Signs of Diabetes

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


Visceral Fat and Subcutaneous Fat
subcutaneous fat
abdominal muscle layer
visceral fat
intestines

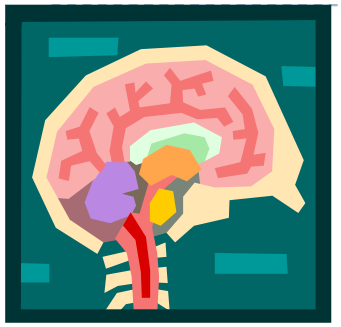
What is Type 2 Diabetes?

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

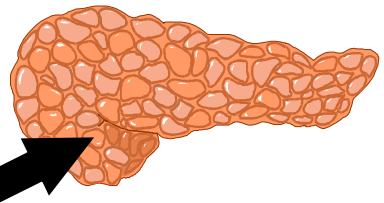
with social, behavioral and environmental risk factors unmasking the effects of genetic susceptibility.

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

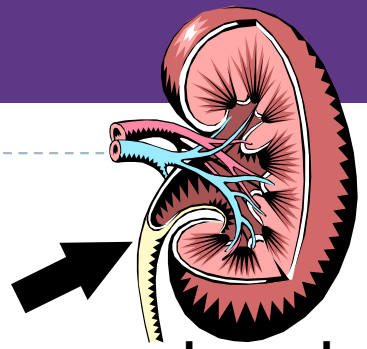
Ominous Octet



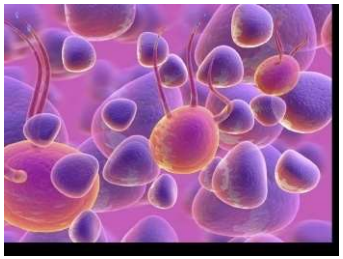
Decreased satiation neuro-transmission



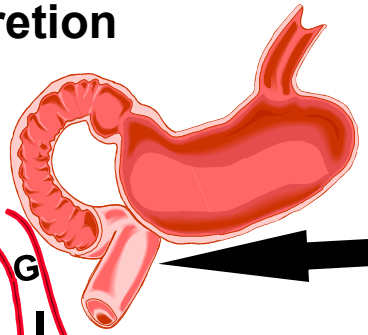
Decreased amylin, β-cell secretion
80% loss at dx



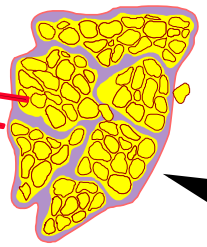
Increased renal glucose reabsorption



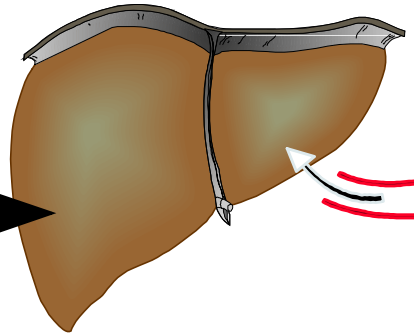
Increased glucagon secretion



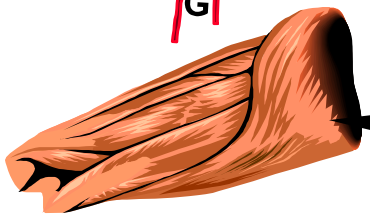
Decreased Gut hormones



Increased lipolysis



Increase glucose production



Decreased glucose uptake


SGLT-2 Inhibitors

Poll Question 7

- A potential side effect of SGLT-2 Inhibitors is:

a. Euglycemic DKA
b. Hypertension
c. Kidney tenderness
d. Increased uric acid

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.

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:** See Package Insert (PI) for GFR cut-offs, dosing. Limited BG lowering effect if GFR < 45, still benefits kidneys & heart at lower GFR. If CKD & GFR ≥20, use SGLT-2 to reduce CVD, HF, preserve renal function. (ADA/EASD) **Benefits:** SGLT-2s* reduce BG, CV death & HF, slow CKD. †Approved for peds, 10 yrs +. Lowers A1C 0.6% to 1.5%.

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?

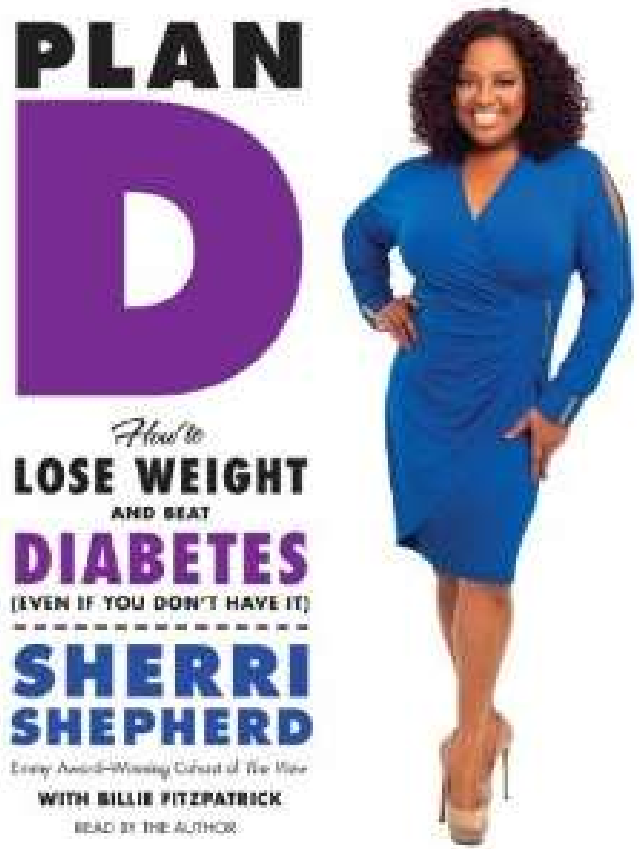
SGLT-2i Indications Summary

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

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

“Getting diabetes saved my life.”
~ Sherri Sheperd



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

Other Types of Diabetes

- Gestational
- Other specific types of diabetes

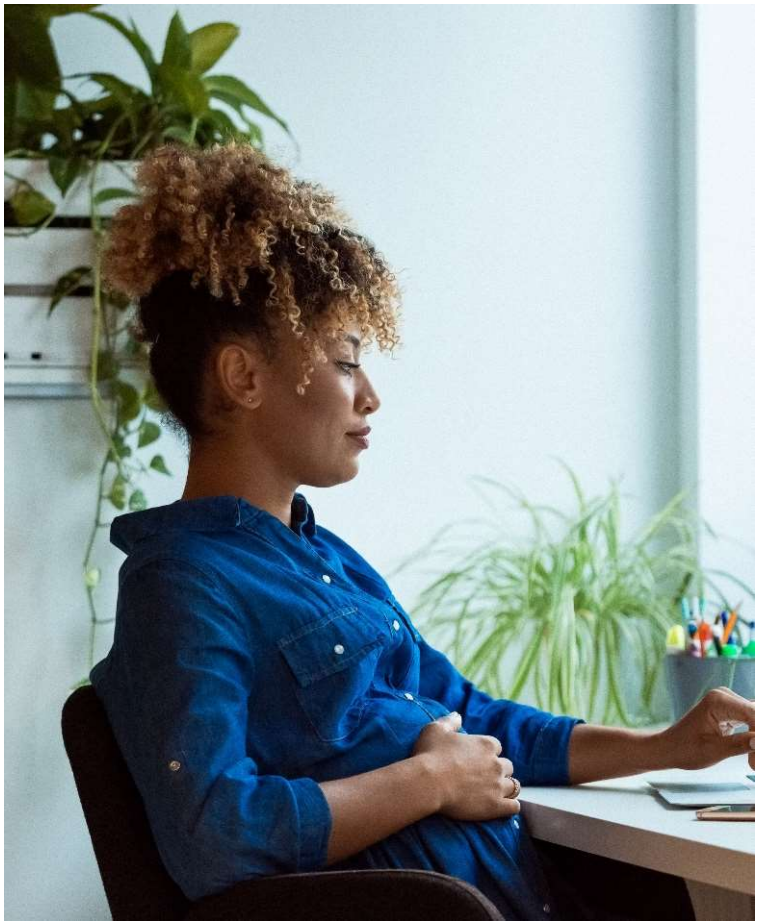
Other Specific Types of DM

- 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

Regardless of the cause, hyperglycemia needs to be treated.

Screening in early Pregnancy

- Checking 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.



15. Management of Diabetes in Pregnancy: *Standards of Care in Diabetes—2024* FREE

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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.

15. Management of Diabetes in Pregnancy: *Standards of Care in Diabetes—2024* FREE

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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. **Caution**: Glyburide most likely to cause hypoglycemia. Lowers A1c 1.0% – 2.0%.
	glipizide: (Glucotrol) (Glucotrol XL)	2.5 – 40 mg 2.5 – 20 mg	
	glimepiride (Amaryl)	1.0 – 8 mg	

Reducing Hypoglycemia

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

- Insulin
- Secretagogues (sulfonylureas, glitinides)

ADA SOC 2024.

Hypoglycemia (Glucose) Alert Values

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

- **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—2024* FREE

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Hypoglycemia: Clinical Risk Factors

Table 6.5

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

Clinical/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§ • Homelessness • Fasting for religious or cultural reasons
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	Other risk factors • Low health literacy • Alcohol or substance use disorder

6. Glycemic Goals and Hypoglycemia: *Standards of Care in Diabetes—2024* FREE

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Components of hypoglycemia prevention for high-risk individuals at initial, follow-up, and annual visits

Hypoglycemia prevention action 6. Glycemic Goals and Hypoglycemia: *Standards of Care in Diabetes—2024* FREE American Diabetes Association Professional Practice Committee	**Initial visit**	**Follow-up visit**	**Annual visit**
Hypoglycemia history assessment	✓	✓	✓
Hypoglycemia awareness assessment	✓		✓
Cognitive function and other hypoglycemia risk factor assessment	✓		✓
Structured education for hypoglycemia prevention and treatment	✓	✓*	✓*
Consideration of continuous glucose monitoring needs	✓	✓	✓
Reevaluation of diabetes treatment plan with deintensification, simplification, or agent modification as appropriate	✓	✓†	✓†
Glucagon prescription and training for close contacts for insulin-treated individuals or those at high hypoglycemic risk	✓		✓
Training to reestablish awareness of hypoglycemia	✓		✓

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

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.

Poll Question 8

- JL is 78 and drinks a "few cocktails" every night. Lives with partner and takes basal insulin at night and bolus insulin as needed. Checks BG a few times a week. Most recent A1c was 5.9%. What is the BG target for JL?

- A. A1c less than 6.5%
- B. Fasting BG 100 +
- C. Ask JL to determine their A1c target.
- D. A1c less than 7% based on the Legacy Trial results.

If on insulin or sulfonylurea – special precautions required

- Carb source on person, car, by bed at all times
- Identification
  - Phone (ICE)
  - Wallet Card
  - Bracelet
- If pattern of lows, med adjustment required
- Pre-meal target
  - 100-130?
- Post meal
  - Less than 180
- Bedtime
  - 110 - 180

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.

Quick Question 9

- 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?

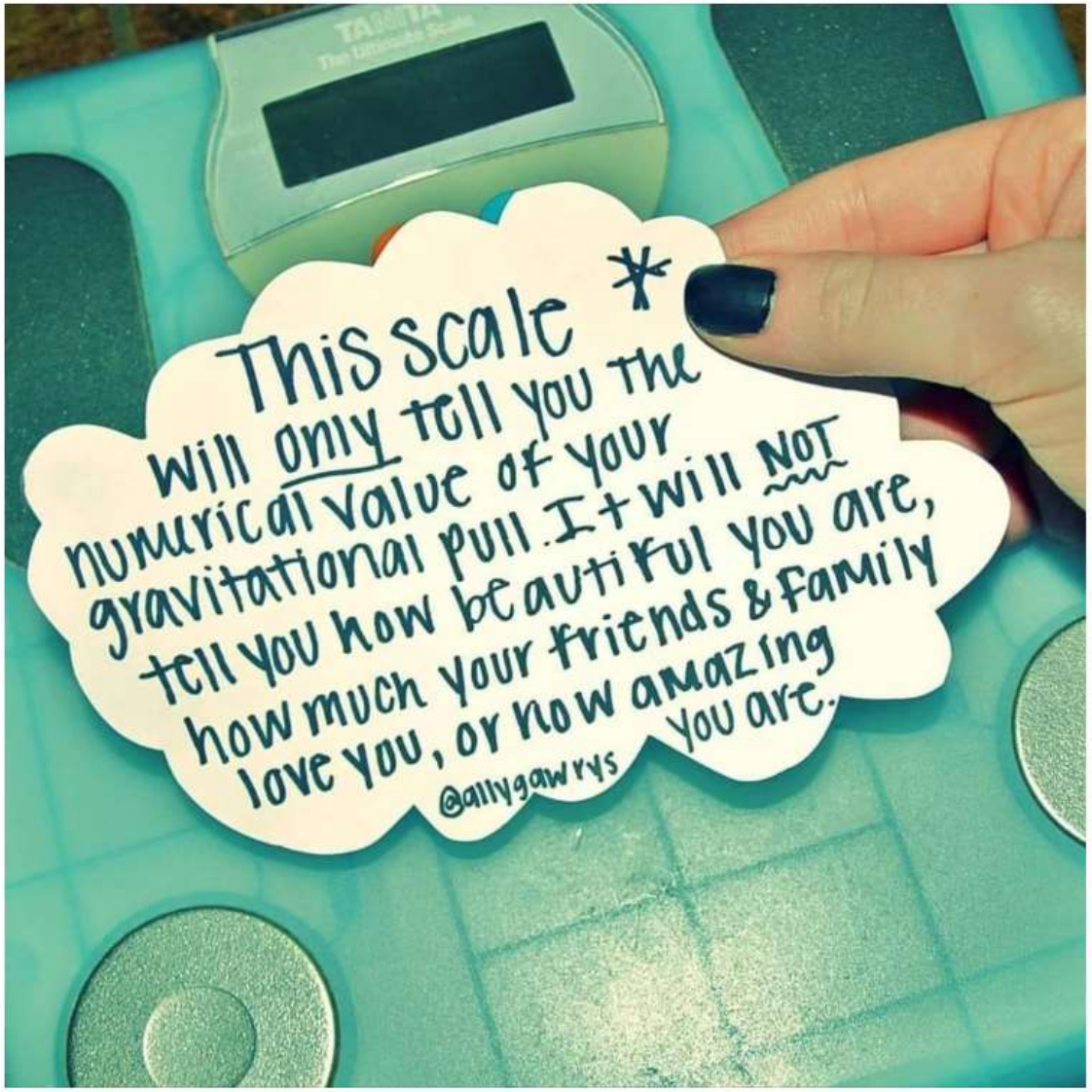
8. Obesity and Weight Management for Prevention & Treatment of Type 2 Diabetes

- Provides cost information for pharmacologic treatment of obesity
- *Once a year, calculate BMI and assess weight trajectory to inform approach*
- *Be sensitive and allow for privacy when weighing*
- Use person centered language

8. Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes: *Standards of Care in Diabetes–2024* FREE

American Diabetes Association Professional Practice Committee

Weight is a Heavy Issue



Person-centered communication

- Use inclusive and nonjudgmental language and active listening
- Elicit individual preferences and beliefs and assesses potential barriers to optimize health outcomes and health-related quality of life.
- Use person-first language (e.g., “person with extra weight” rather than “obese person”) to avoid defining people by their condition.

Use of BMI and Other Assessments

- WHO defines Obesity as: *abnormal or excessive fat accumulation that presents a risk to health*
- BMI poor indicator for ”excessive fat” and health risk

Overall - assess individual’s
- adipose tissue mass
- distribution (using waist circumference, waist-to-hip ratio, or waist-to-height ratio),
- function and
- presence of associated health or well-being consequences: metabolic, physical, or psychological well-being

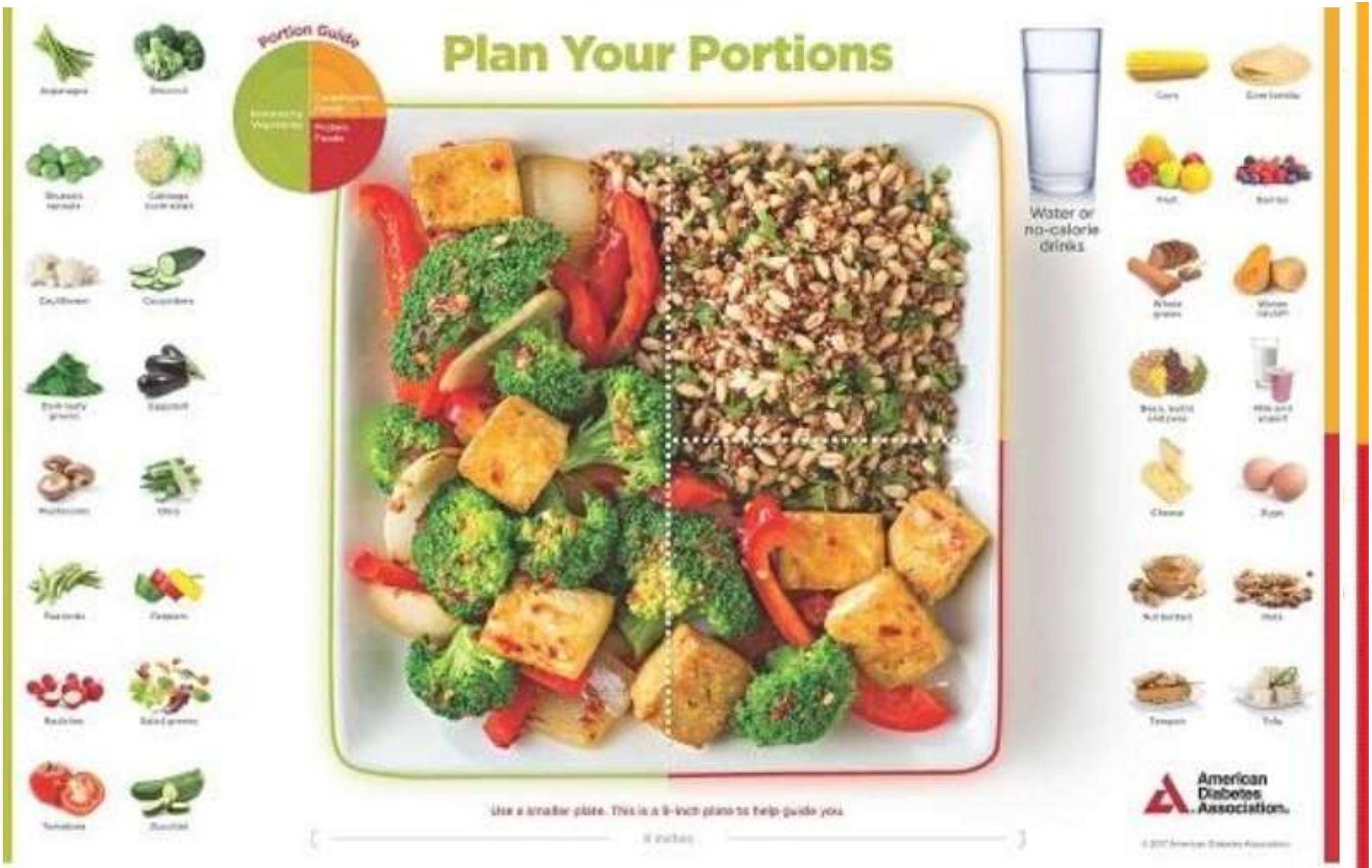
8. Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes: *Standards of Care in Diabetes–2024* FREE

American Diabetes Association Professional Practice Committee

Plan Your Portions

American Diabetes Association.
Connected for Life

What Can I Eat?®



Weight Loss is Helpful

- Prediabetes weight loss goal is > 7% for preventing diabetes progression.
- Diabetes: Strong evidence that
  - Weight loss of 3–7% improves glycemia & intermediate CVD risk
  - >10% loss, may lead to remission of type 2 diabetes, CVD, & reduced mortality
  - Reduces need for medications
- Optimal goal is healthy weight maintenance

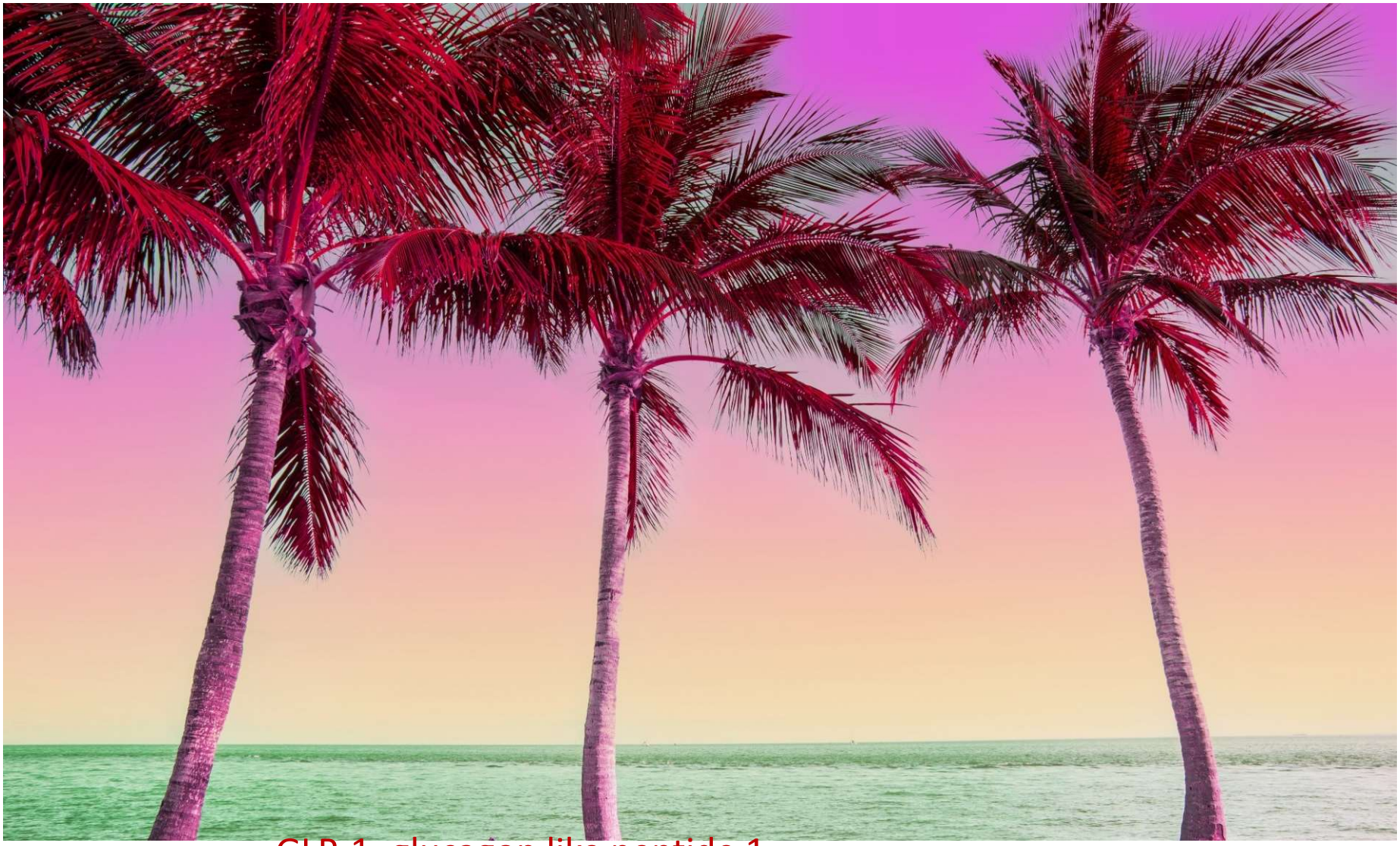
8. Obesity and Weight Management for the Prevention and Treatment of Type 2 Diabetes: *Standards of Care in Diabetes–2024* FREE

American Diabetes Association Professional Practice Committee

"People with diabetes and overweight or obesity may benefit from any magnitude of weight loss."

"Nutrition, physical activity, and behavioral therapy to achieve and maintain ≥5% weight loss are recommended for people with type 2 diabetes and overweight or obesity"

Incretins: GLP & GIP Receptor Agonists



GLP-1: glucagon like peptide 1

GIP: glucose-dependent insulinotropic polypeptide

Actions of GLP-1 and GIP

Glucagon-like Peptide-1 Receptor Agonism

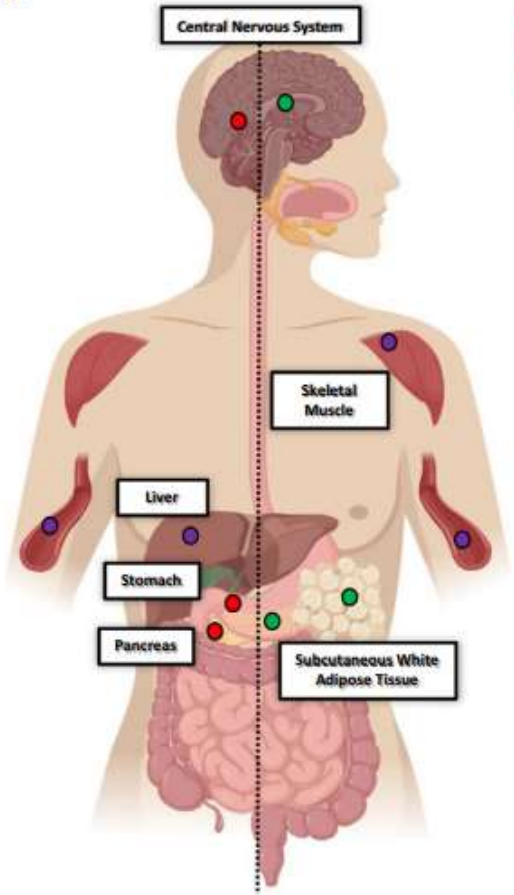
Central Nervous System
- ↑ Satiety
- ↓ Food Intake
- ↑ Nausea
- ↓ Body Weight

Pancreas
- ↑ Insulin
- ↓ Glucagon

Stomach
- ↓ Gastric Emptying

Systemic
- ↓ Hyperglycemia

Liver
- ↑ Insulin Sensitivity
- ↓ Hepatic Glucose Production
- ↓ Ectopic Lipid Accumulation



Glucose-dependent Insulinotropic Polypeptide Receptor Agonism
Glucagon-like Peptide 1 Receptor Agonism
Indirect Action

Glucose-dependent Insulinotropic Polypeptide Receptor Agonism

Central Nervous System
- ↓ Food Intake
- ↓ Nausea
- ↓ Body Weight

Pancreas
- ↑ Insulin
- ↑ Glucagon

Subcutaneous White Adipose Tissue
- ↑ Insulin Sensitivity
- ↑ Lipid Buffering Capacity
- ↑ Blood Flow
- ↑ Storage Capacity
- ↓ Proinflammatory Immune Cell Infiltration

Systemic
- ↓ Hyperglycemia
- ↓ Dietary Triglyceride

Skeletal Muscle
- ↑ Insulin Sensitivity
- ↑ Metabolic Flexibility
- ↓ Ectopic Lipid Accumulation

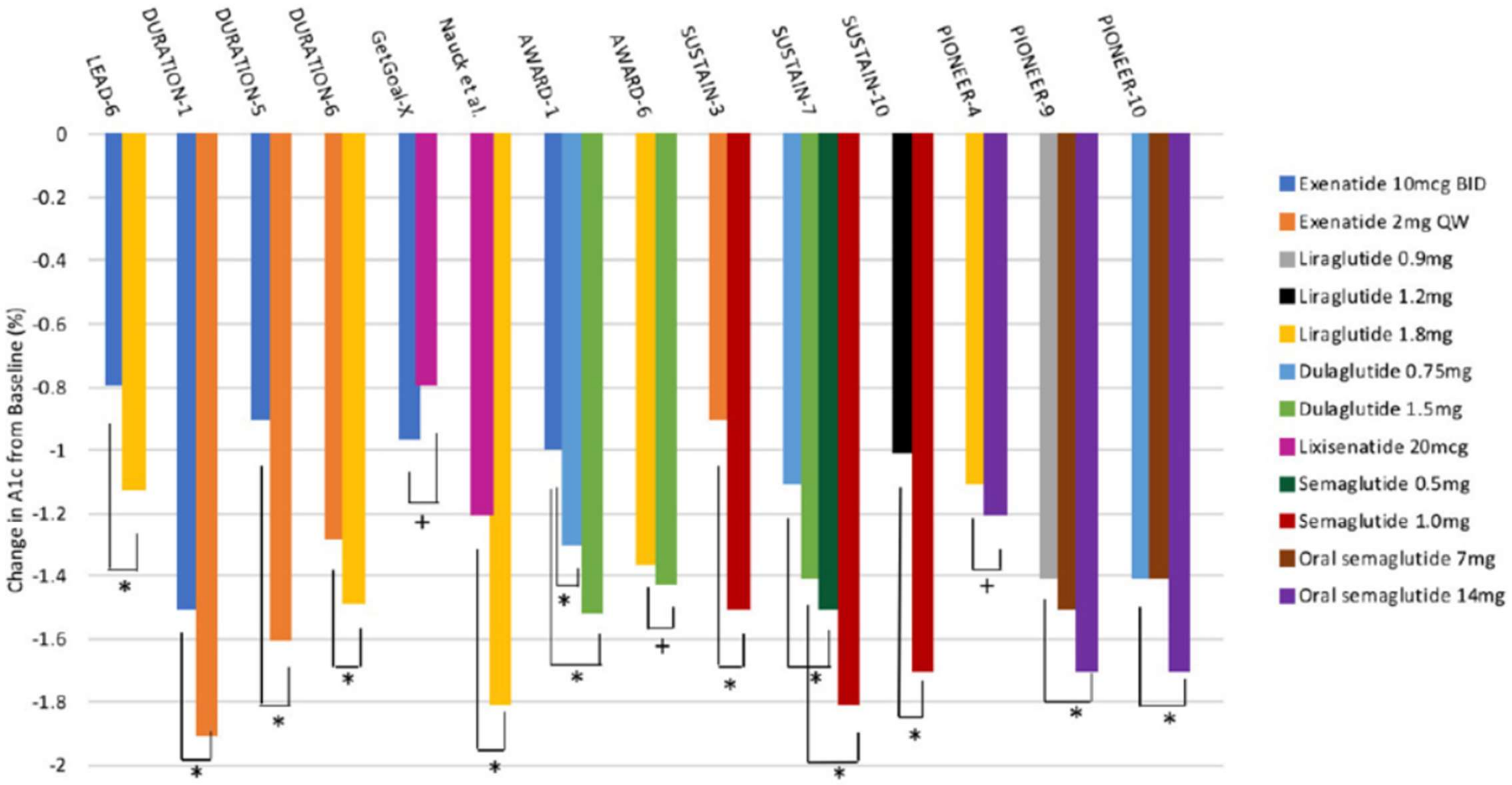
Samms RJ, Coghlan MP, Sloop KW. How May GIP Enhance the Therapeutic Efficacy of GLP-1? Trends Endocrinol Metab. 2020 Jun;31(6):410-421.

Pocket Card: GLP-1 & GIP RA

GLP-1 & GIP Receptor Agonists

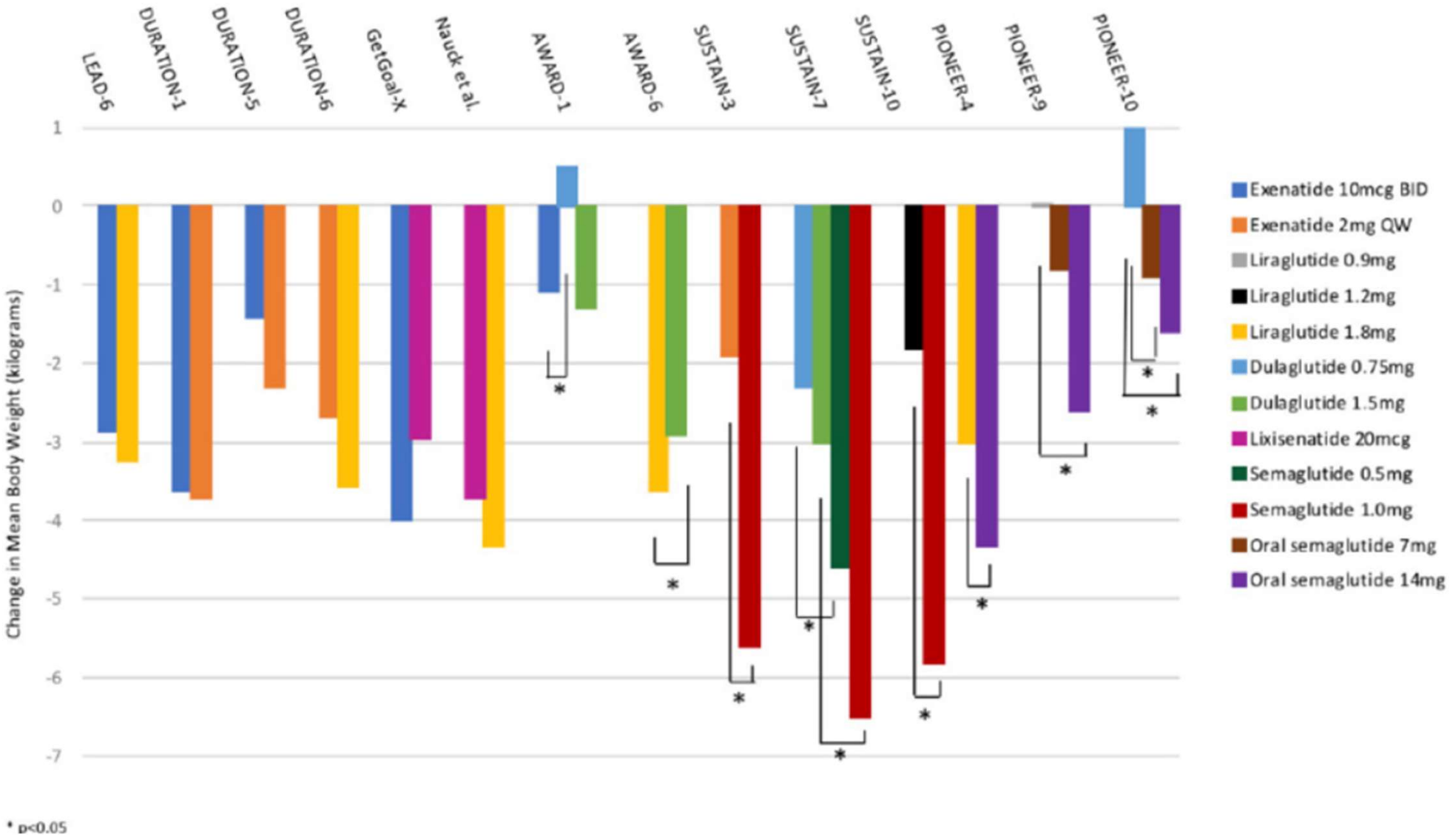
Class/Main Action	Name	Dose Range	Considerations
GLP-1 RA - Glucagon Like Peptide Receptor Agonist **"Incretin Mimetic"** • Increases insulin release with food • Slows gastric emptying • Promotes satiety • Suppresses glucagon	exenatide (Byetta)	5 and 10 mcg BID	**Side effects:** nausea, vomiting, weight loss, injection site reaction. Report signs of acute pancreatitis or intestinal blockage (ileus) and stop med. Increase dose monthly to achieve targets. **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 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.

A1C Lowering with GLP-1 RA



Trujillo JM, Nuffer W, Smith BA. GLP-1 receptor agonists: an updated review of head-to-head clinical studies. Ther Adv Endocrinol Metab. 2021.

Weight Loss with GLP-1 RA



* p<0.05

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

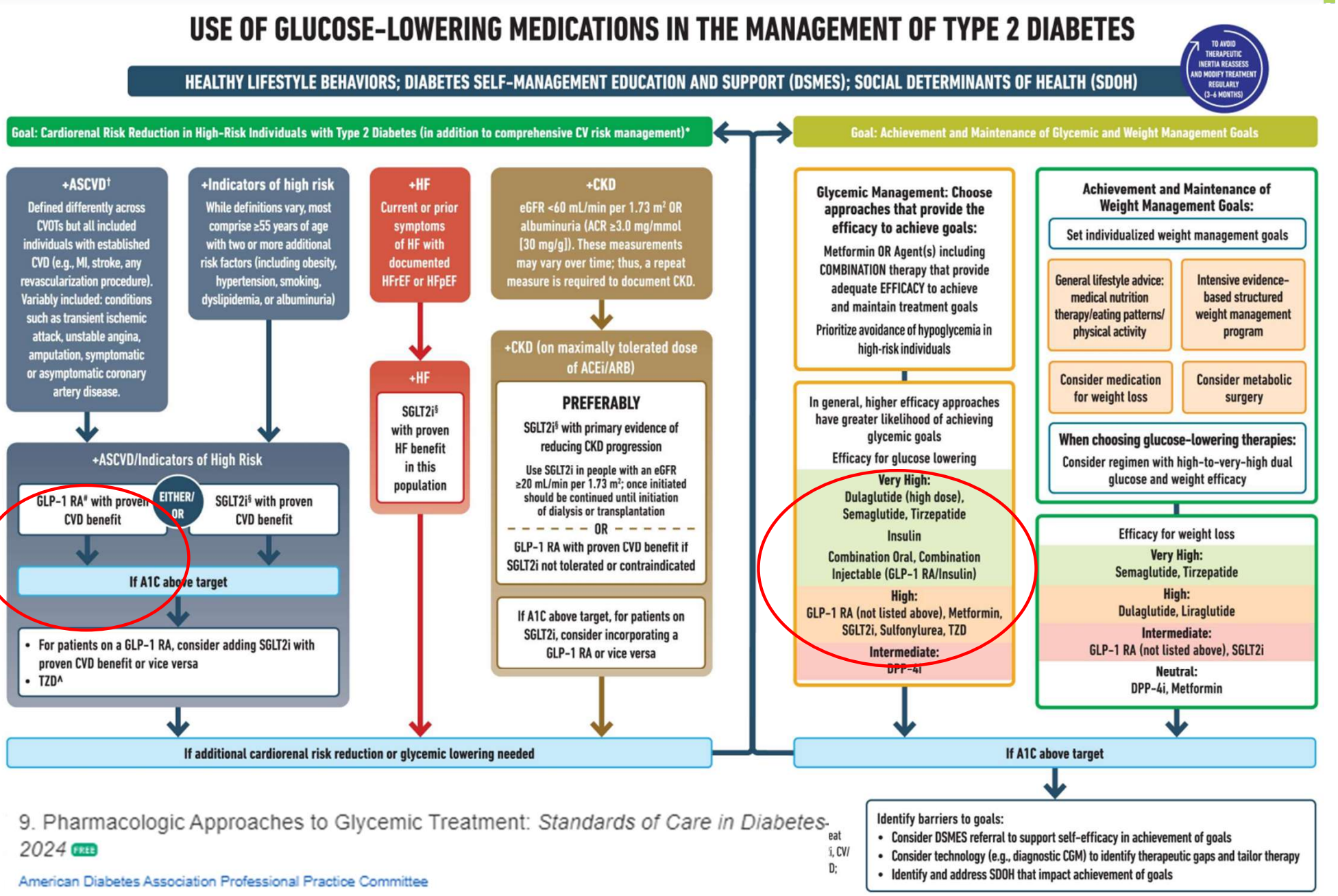
- Avoid if personal or family history of medullary thyroid cancer
- Start at lower dose and titrate
- Eat smaller *nourishing* meals to reduce nausea
- Avoid high fat meals
- Reconsider nausea as feeling full
- Store extra pens in fridge
- Avoid in combo with DPP-4 inhibitors
- Report any sudden abdominal pain or pancreatitis symptoms
- Ask about recent eye exam
  - Potential increase in diabetes retinopathy

Poll Question 10

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.

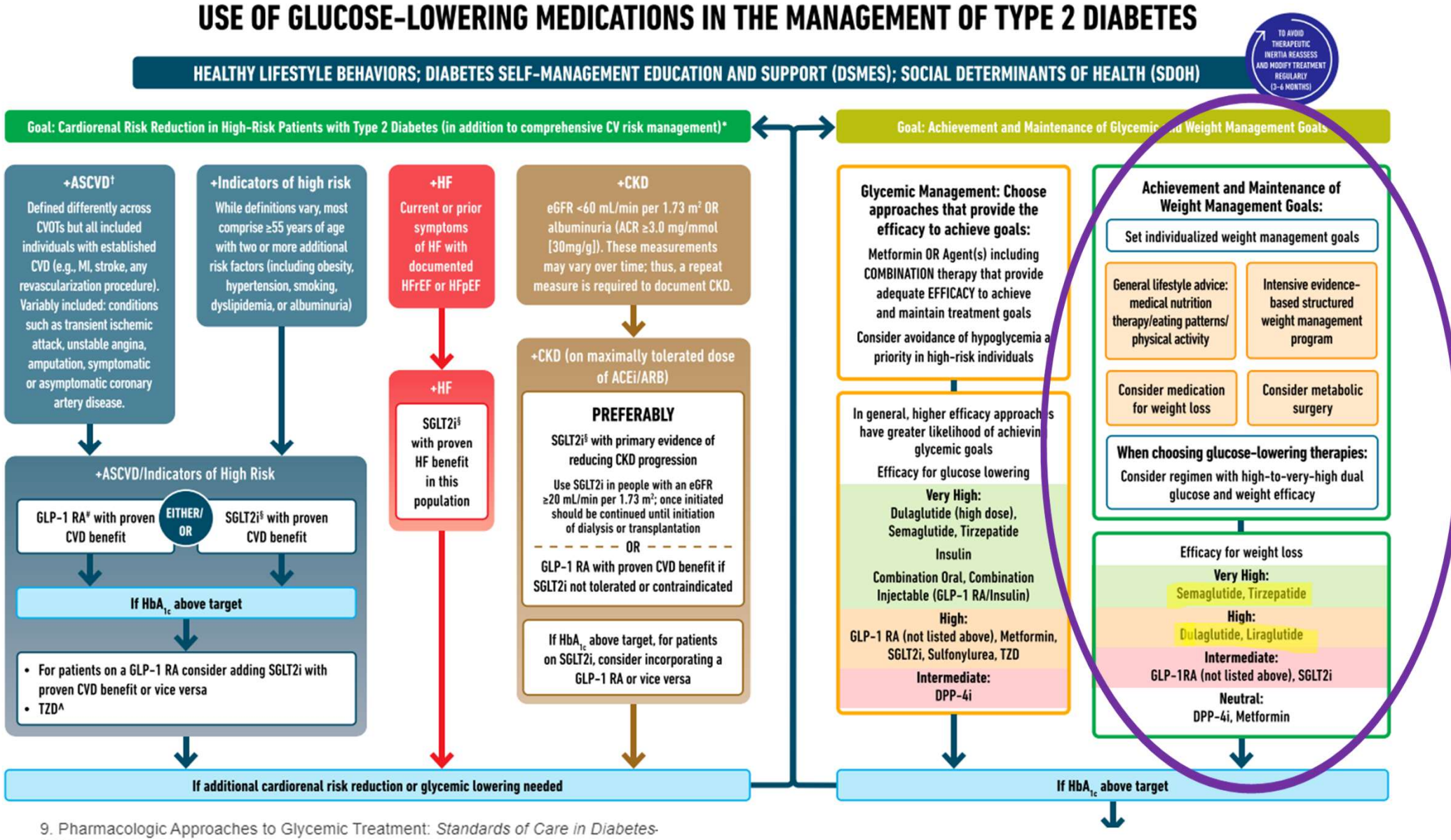
ADA Algorithm: Where do GLP-1 Fit?



9. Pharmacologic Approaches to Glycemic Treatment: *Standards of Care in Diabetes-2024* FREE

American Diabetes Association Professional Practice Committee

ADA Meds Algorithm



9. Pharmacologic Approaches to Glycemic Treatment: *Standards of Care in Diabetes-2024* FREE

American Diabetes Association Professional Practice Committee

GLP-1/GIP Receptor Agonist Indications

Drug	Lower BG	Reduce CV Risk?	Wt loss approved?
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	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 either metabolic surgery or medical treatment.
  - A1C of 6.0% or lower after 5 years - 29% of those treated with RYGB and 23% treated with vertical sleeve gastrectomy (vs 5% med mgmt)
  - Avg wt loss 25 -30% plus decreased CV mortality & improved QoL
- Erosion of diabetes remission over time
  - at least 35–50% of individuals who initially have remission eventually experience 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

Treatment options for BMI 25+

Treatment options for overweight and obesity in type 2 diabetes

Treatment	BMI category (kg/m²)		
	25.0–26.9 (or 23.0–24.9*)	27.0–29.9 (or 25.0–27.4*)	≥30.0 (or ≥27.5*)
Diet, physical activity, and behavioral therapy	+	+	+
Pharmacotherapy		+	+
Metabolic surgery			+

Consider using diabetes medications that contribute to weight loss, including GLP-1 RAs and SGLT-2 inhibitors.

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 xs 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".

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
  - ADA PostGrad 2010

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

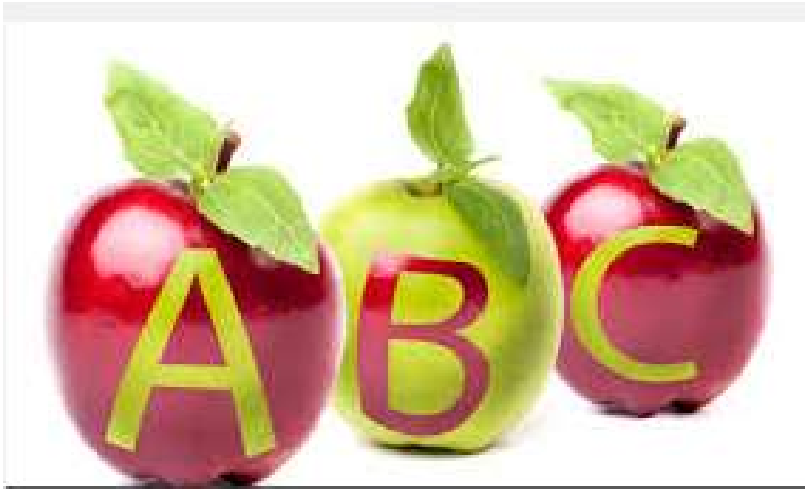
"I don't have time to exercise, I MAKE time." Mike Huckabee

6. Glycemic Goals & Hypo

A1C

Blood Pressure

Cardiovascular risk reduction



ABC's of Diabetes

- A1c less than 7% (individualize)
  - Pre-meal BG 80-130
  - Post meal BG <180
  - AGP - 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 50%, LDL <70
  - If 40+ with ASCVD, decrease 50%, LDL <55

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)

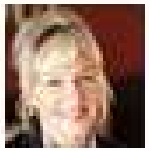
A1c (%)	eAG
5	**97** (76-120)
6	**126** (100-152)
7	**154** (123-185)
8	**183** (147-217)
9	**212** (170 -249)
10	**240** (193-282)
11	**269** (217-314)
12	**298** (240-347)

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

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



Diabetes Education Services

Published by Beverly Thomassian [?] · July 7 ·

Kindness matters!
Learning to be less harsh or judgmental and more compassionate to oneself may help people with diabetes manage their disease and stave off depression, a recent study suggests.

Self-compassion may help people with diabetes achieve better glucose control and less depression

By Reyna Gobel(Reuters Health) – Learning to be less harsh or judgmental and more...

REUTERS.COM | BY REYNA GOBEL

ADA 2024 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

ADA 2024 Standard 11 - Chronic Kidney Disease and Risk Management

- Optimize glucose and BP to protect kidneys
- Screen Urine Albumin Creatinine ratio (UACR) & GFR
  - Type 2 at dx then yearly
  - Type 1 with diabetes for 5 years, then yearly
  - If urinary albumin ≥300 and GFR 30–60 monitor 1-4 times a year to guide therapy.
- Treat hypertension with ACEI or ARB and for elevated albumin-to-creatinine ratio of 30 -299.
- Monitor serum creat and K+
  - if on ACE, ARB or diuretics

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—2024*
FREE

Poll Question 5

- Evaluating kidney function is important to determine most beneficial treatment interventions. Which of the following measurements would indicate that JR has healthy kidney function?

A. Urinary albumin creatinine ratio of 30-299 mg/g with GFR of 45.
B. GFR of 60 or greater and urinary albumin creatinine ratio of 12 mg/g.
C. Urinary albumin creatinine ratio less than 30 mg/g and GFR of 30-45.

- Creatinine of 1.5 and urinary albumin creatinine ratio of 300 mg/g or greater.

11. Chronic Kidney Disease and Risk Management: *Standards of Care in Diabetes—2024*

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CKD is classified based on: • Cause (C) • GFR (G) • Albuminuria (A)				Albuminuria categories Description and range		
				A1	**A2**	**A3**
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30–299 mg/g 3–29 mg/mmol	≥300 mg/g ≥30 mg/mmol
GFR categories (mL/min/1.73 m²) Description and range	**G1**	Normal or high	≥90	Screen 1	Treat 1	Treat and refer 3
	G2	Mildly decreased	60–89	Screen 1	Treat 1	Treat and refer 3
	G3a	Mildly to moderately decreased	45–59	Treat 1	Treat 2	Treat and refer 3
	G3b	Moderately to severely decreased	30–44	Treat 2	Treat and refer 3	Treat and refer 3
	G4	Severely decreased	15–29	Treat and refer* 3	Treat and refer* 3	Treat and refer 4+
	G5	Kidney failure	<15	Treat and refer 4+	Treat and refer 4+	Treat and refer 4+

Low risk (if no other markers of kidney disease, no CKD)

Moderately increased risk

High risk

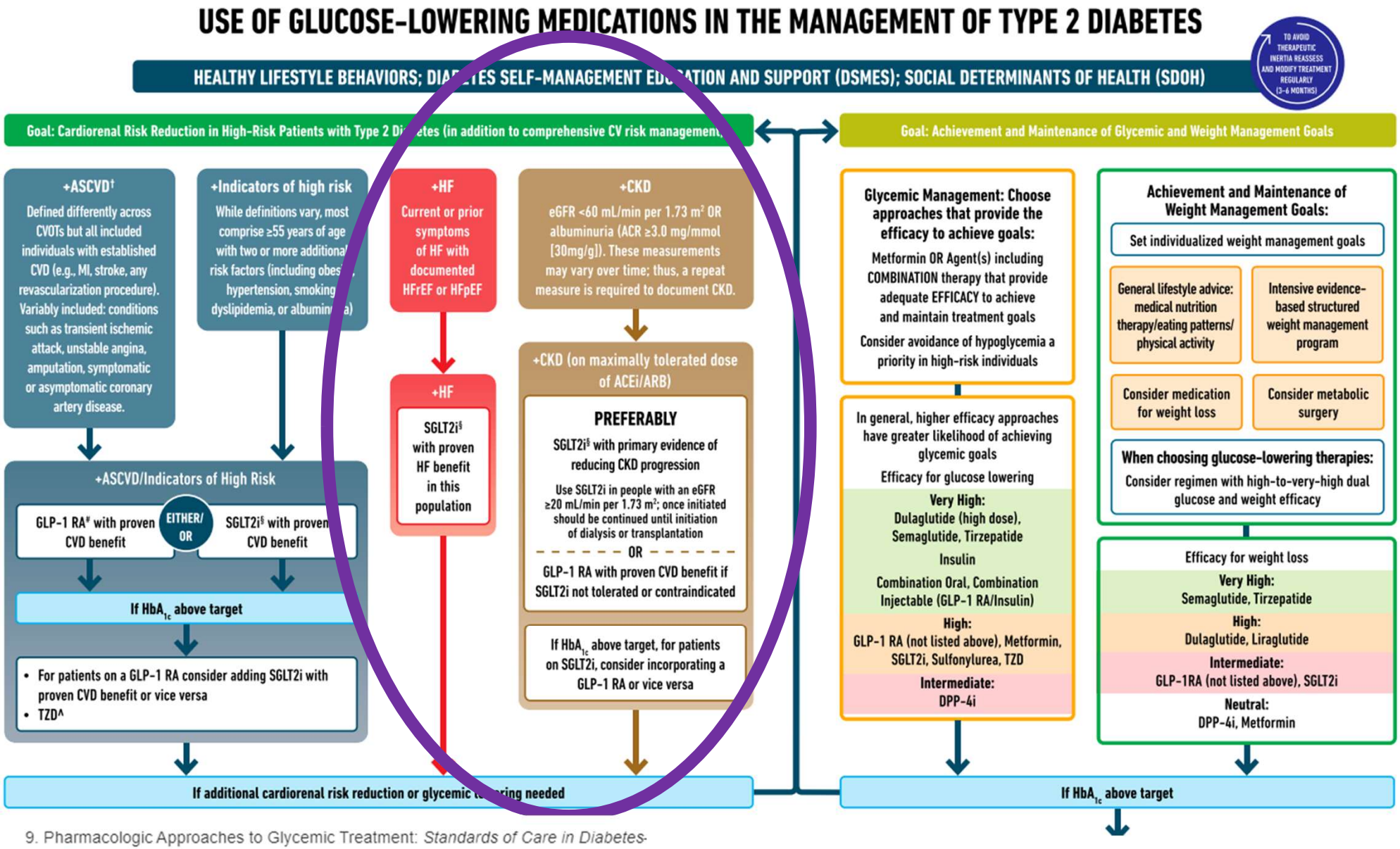
Very high risk

Diabetes + CKD – Increases CVD Risk

- Chronic kidney disease (CKD) is a frequent complication in diabetes
  - Type 1 diabetes ~30%
  - Type 2 diabetes ~40%
- In several studies, participants on SGLT2i with GFRs of 30-60 (stage 3) reduced ASCVD risk and improved renal function
  - Slowed kidney disease or death
  - Reduced albuminuria

National Kidney Foundation.
https://www.kidney.org/atoz/content/diabetes

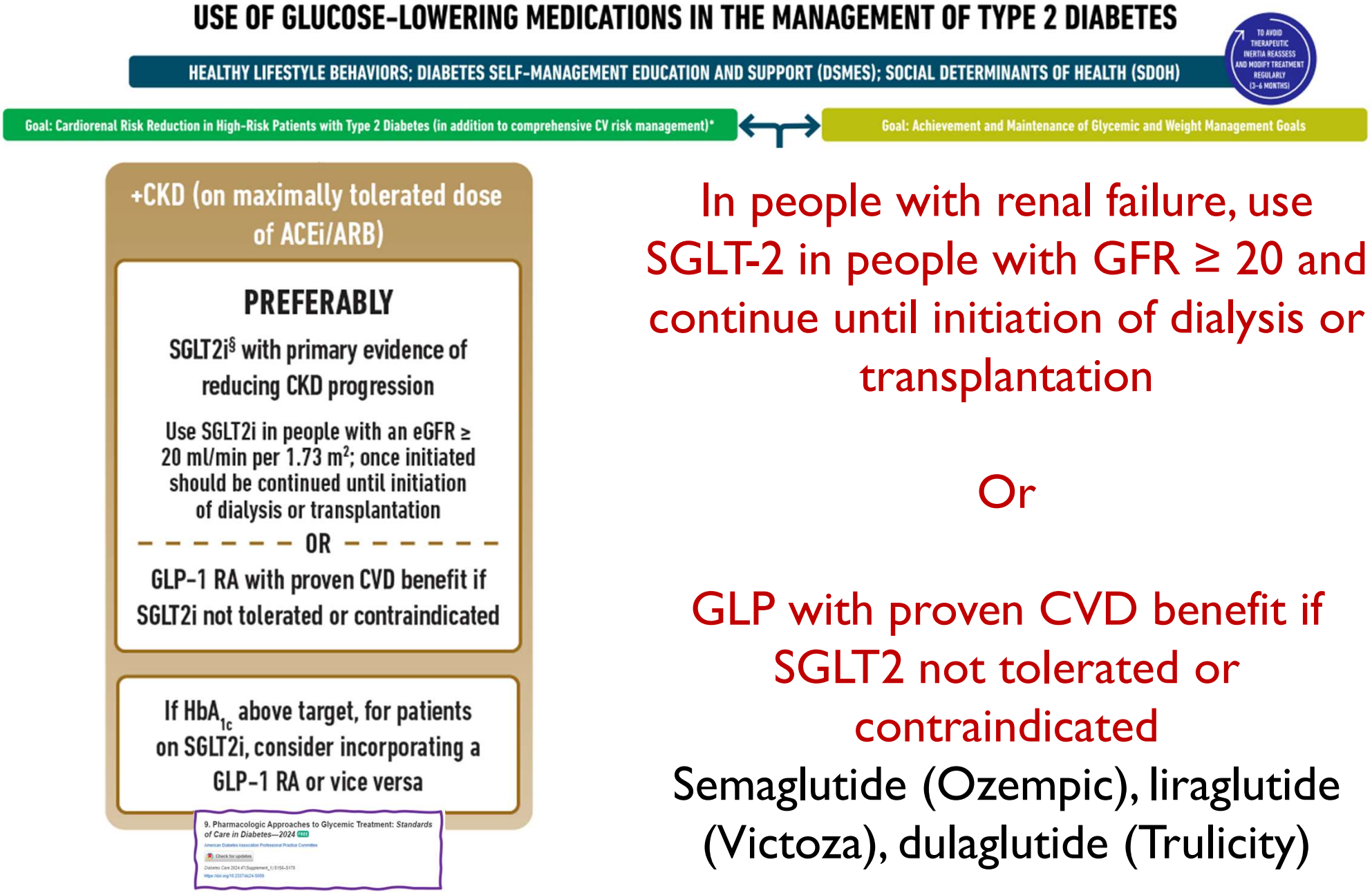
ADA Meds Management



9. Pharmacologic Approaches to Glycemic Treatment: *Standards of Care in Diabetes-2024* FREE

American Diabetes Association Professional Practice Committee

Choosing glucose-lowering medication in people with Chronic Kidney Disease



In people with renal failure, use SGLT-2 in people with GFR ≥ 20 and continue until initiation of dialysis or transplantation

Or

GLP with proven CVD benefit if SGLT2 not tolerated or contraindicated

Semaglutide (Ozempic), liraglutide (Victoza), dulaglutide (Trulicity)

SGLT2 Inhibitor CKD Evidence Summary

Trial Name	SGLT2 Inhibitor vs placebo	Outcomes (Primary Bolded)
CREDENCE	Canagliflozin	N=4401, Median follow-up 2.6 years, Prior CVD 50.4% **ESRD, doubling of create or death from renal or CV cause** (primary): 0.70 (0.59-0.82), 3 point MACE 0.80 (0.67-0.95)
DAPA-CKD	Dapagliflozin	N=4304, 2906 with diabetes, Median follow-up 2.4 years, Prior CVD 37.4% **>50% decline in eGFR, ESKD or renal/CV death (primary**): 0.61 (0.51-0.72)
EMPA-Kidney	Empagliflozin	N=6609, Median follow-up 2.0 years, Prior CVD 27%, 46% with DM **ESRD, >40% decline in eGFR, ESKD, or renal/CV death (primary**): 0.72 (0.64-0.82), stopped early due to positive benefit

Perkovic V, Jardine MJ, Neal B, et al. Canagliflozin and renal outcomes in type 2 diabetes and nephropathy. N Engl J Med. 2019;380:2295–2306.
Heerspink HJL, Stefansson BV, Correa-Rotter R, et al. Dapagliflozin in patients with chronic kidney disease. N Engl J Med. 2020;383:1436–1446.
EMPA-KIDNEY Collaborative Group, Herrington WG, Staplin N, Wanner C, et al. Empagliflozin in Patients with Chronic Kidney Disease. N Engl J Med. 2022 Nov 4. doi: 10.1056/NEJMoa2204233. Epub ahead of print. PMID: 36331190.

SGLT-2 Inhibitor Dosing & Indication

Once an SGLT2i is initiated, it is reasonable to continue an SGLT2i even if the eGFR falls below 20 ml/min/1.73 m2 , unless it is not tolerated or kidney replacement therapy is initiated.

Drug	Dose	FDA Approved Indications
Ertugliflozin (Steglatro)	5-15 mg daily	As an adjunct to diet and exercise to improve glycemic control in adults with T2DM (All)
Dapagliflozin (Farxiga)	5-10 mg daily	• To reduce the risk of hospitalization for HF in adults with T2DM and established CVD or multiple CV risk factors. • To reduce the risk of CV death and hospitalization for HF, and urgent HF visit in adults **with HF.** • To reduce the risk of sustained eGFR decline, ESKD, CV death, and hospitalization for HF in **adults with CKD** at risk of progression.
Empagliflozin (Jardiance)	10-25 mg daily	• To reduce the risk of CV death in adults with T2DM and established CVD. • To reduce the risk of CV death and hospitalization for HF in **adults with HF** • **To reduce the risk of sustained decline in eGFR, ESKD, CV death, and hospitalization in adults with CKD at risk of progression.**
Canagliflozin (Invokana)	100-300mg daily	• To reduce MACE in adults with T2DM and established CVD. • To reduce the risk of ESKD, doubling of serum creatinine, CV death, and hospitalization for HF in adults with T2DM and diabetic nephropathy with albuminuria >300 mg/day.
Bexagliflozin	20mg daily	As an adjunct to diet and exercise to improve glycemic control in adults with T2DM

Standard 11 – Protect Kidneys

- Diabetes with a
  - GFR ≥20 and
  - UACR ≥200 mg/g
- Start SGLT2 to reduce chronic kidney disease progression and cardiovascular events.

- 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—2024*
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Finereone's Place in Therapy

- In people with CKD and albuminuria who are at increased risk for CV events or CKD progression
  - a nonsteroidal mineralocorticoid receptor antagonist (finerenone) is recommended to reduce CKD progression and CV events.
- First optimize ACEI or ARB

ADA SOC 2024

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

- **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 higher levels of dietary protein intake since protein energy wasting can be of concern

11. Chronic Kidney Disease and Risk Management: *Standards of Care in Diabetes—2023* FREE

Diabetes Meds Lower CardioRenal Risk

- If diabetes plus ASCVD risk factors
  - SGLT-2s* and GLP-1s* reduce risk of major adverse CV events
  - Plus ACE or ARB
  - Post MI, continue beta blockers for 3 years.
- If type 2 diabetes and heart failure
  - SGLT-2s reduce risk of heart failure and hospitalization.
  - Also consider beta blocker

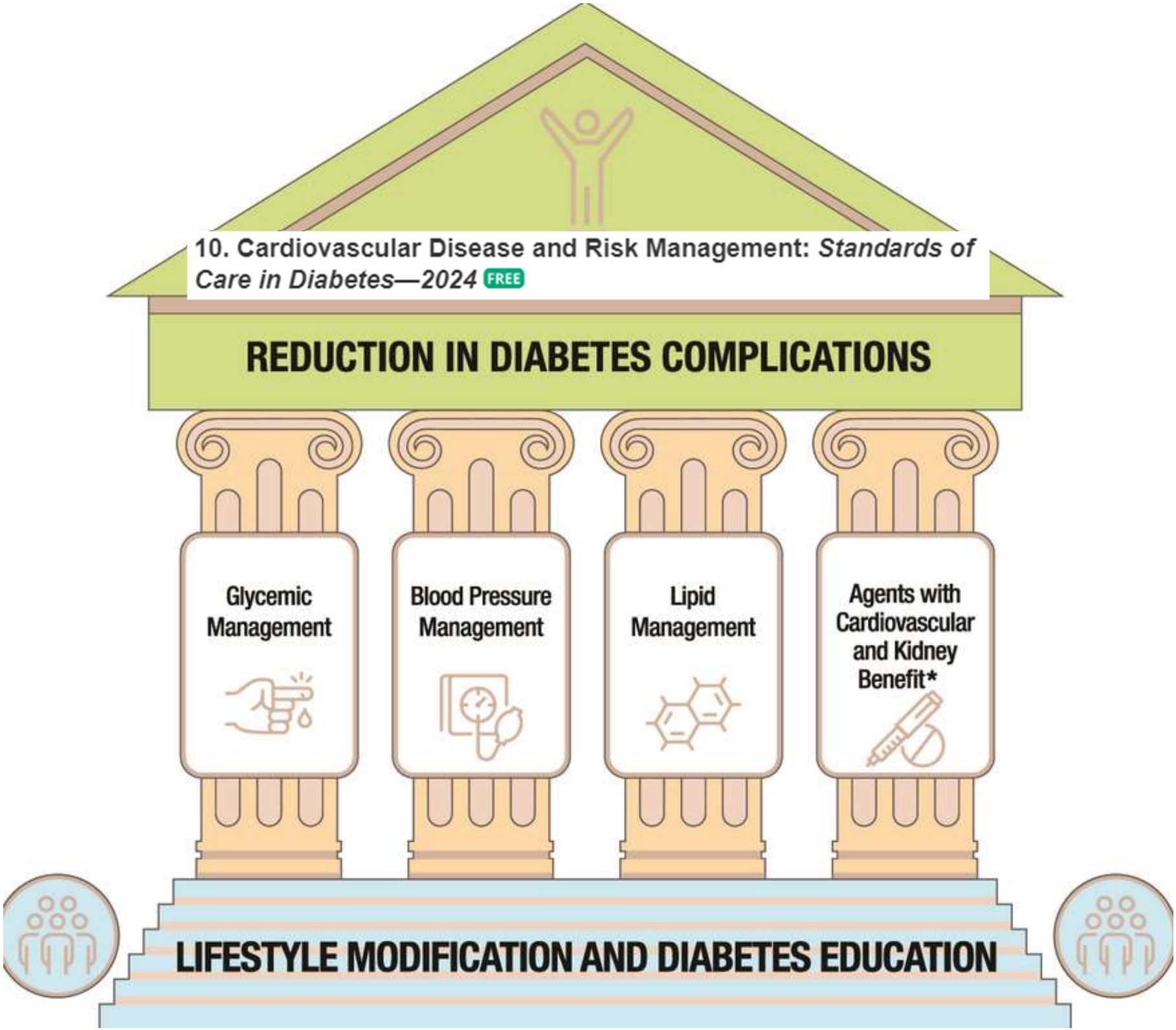
10. Cardiovascular Disease and Risk Management: *Standards of Care in Diabetes—2024* FREE

10. Cardiovascular Disease and Risk Management

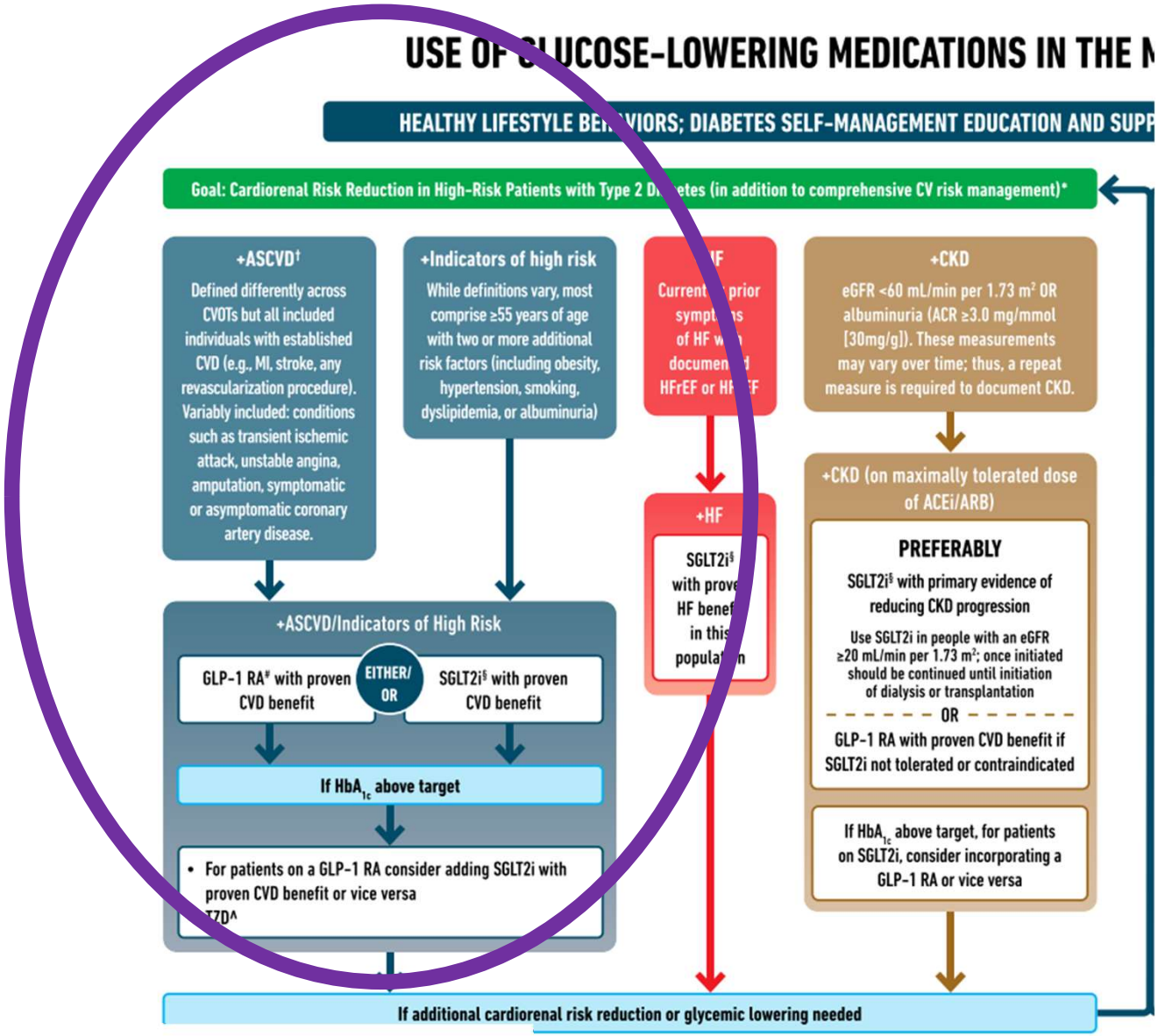
- Atherosclerotic cardiovascular disease (ASCVD) and Heart Failure are leadings causes of morbidity and mortality in diabetes.
- ASCVD includes:
  - coronary heart disease (CHD),
  - cerebrovascular disease, or
  - peripheral arterial disease
- $39.4 billion in cardiovascular-related spending per year

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

With more aggressive goals, rates of CVD have decreased over past decade


10. Cardiovascular Disease and Risk Management: *Standards of Care in Diabetes—2024* FREE
REDUCTION IN DIABETES COMPLICATIONS
Glycemic Management
Blood Pressure Management
Lipid Management
Agents with Cardiovascular and Kidney Benefit*
LIFESTYLE MODIFICATION AND DIABETES EDUCATION

ADA Meds Management



9. Pharmacologic Approaches to Glycemic Treatment: *Standards of Care in Diabetes-2024* FREE

American Diabetes Association Professional Practice Committee

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.

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

Poll Question 13

- RJ is a healthy 52 yr old with diabetes. RJ takes an ACE Inhibitor, insulin and a statin. According to ADA Standards of Care 2024, what is the blood pressure target for RJ?
- A. Less than 120/70
- B. Less than 130/80
- C. Less than 140/90
- D. Less than 135 /85

BP and Diabetes Targets

- **BP target <130/80 (if it can be safely attained)**

- Confirm systolic BP ≥ 130 or diastolic BP ≥ 80 using multiple readings, including measurements on a separate day, to diagnose hypertension.
- If BP ≥ 180/110, can be diagnosed at single visit
- BP target based on ind assessment, shared decision making and potential adverse effects
- Monitor BP at home and at each visit
- During pregnancy, with previous history of HTN
  - B/P Target of 110 -135/85

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

Lipid and HTN Meds Cheat Sheets

Cholesterol Medications

LDL Lowering Medications

Class / Action	Generic / Trade Name	Usual Daily Dose Range	LDL % Lowering	Considerations
"Statins" HMG- CoA Reductase Inhibitors Inhibits enzyme that converts HMG-CoA to mevalonate - limits cholesterol production	Atorvastatin / Lipitor*	10 – 80 mg	20- 60	Lowers TGs 7-30% Raise HDL 5-15% Take at night. **Side effects**: weakness, muscle pain, elevated glucose levels. Review package insert for specific dosing adjustments based on drug, food interactions (ie grapefruit).
	Fluvastatin / Lescol* Lescol XL	20 – 80 mg 80 mg	20- 35	
	Lovastatin* Mevacor Altoprev XL	 20 - 80 mg 10 - 60 mg	20- 45	
	Pravastatin / Pravachol*	10 - 80 mg	20- 45	
	Rosuvastatin / Crestor	5 – 40 mg	20- 60	
	Simvistatin / Zocor*	20 – 80 mg	20- 55	
	Pitavastatin / Livalo	2 – 4 mg		
Bile Acid Sequestrants **Action:** Bind to bile acids in intestine, decreasing cholesterol production. Secondary action – raise HDL	Cholestyramine/ Questran*	4 to 16 g per day powder – 1 scoop 4g	Lower LDL by 15-30%	May raise TG levels. Raise HDL 3-5%. Avoid taking in same timeframe w/ other meds – may affect absorption (see package insert). Side effects: GI in nature
	Colesevelam / Welchol **Lowers A1c 0.5%**	3.75 x 1 daily 1.875 x 2 daily (625mg tablets)		
	Colestipol / Colestid	2 - 16 gms per day tabs Powder – 1 scoop = 5g 5 to 20 gm per day Mix w/ fluid		
Cholesterol Absorption Inhibitors	Ezetimibe / Zetia	10 mg – 1x daily	15-20%	Usually used in combo w/statin. Headache, rash.
Plant Stenols	Benecol	3 servings daily	14%	Well tolerated
Plant Sterols	Take Control	2 servings daily	17%	

Triglyceride Lowering / HDL Raising Medications

If TG> 500, lower TG first, then reduce LDL.

Antihypertensive Medications

ACE and ARBs are preferred therapy for diabetes with hypertension and albuminuria – If B/P not at goal with either of these agents, add a diuretic or other class. Do not use during pregnancy or in persons w/ renal or hepatic dysfunction. Start w/ low dose, gradually increase. If one class is not tolerated, the other should be substituted. For those treated with an ACE inhibitor, angiotensin receptor blocker, or diuretic, serum creatinine/estimated glomerular filtration rate and serum potassium levels should be monitored at least annually. ADA Standards CV Disease Risk Management

Class / Action	Generic / Trade Name	Usual Daily Dose Range	Frequency	Considerations
ACE Inhibitors Angiotensin Converting Enzyme **Action** - Block the conversion of AT-I to AT-II. Also stimulates release of nitric oxide causing vasodilation.	benazepril / Lotensin†	10 – 40 mg	1 x a day	Try to take same time each day. Effects seen w/in 1 hr of admin, max effects in 6 hrs. **Side effects**: Can cause cough (due to increased bradykinin) – can try different med in same class. Also can cause fatigue, dizziness, hypotension. †These meds are also available as a combo w/ low dose HCTZ (hydrochlorothiazide). ‡These meds are also available as a combo w/ CCB (calcium channel blocker) usually amlodipine
	captopril /Capoten*†	12.5 - 100 mg	2-3 x a day	
	Enalopril/ Vasotec*†	2.5 - 40 mg	1-2 x a day	
	Fosinopil / Monopril†	10- 40 mg	1 x a day	
	Lisinopril *† Prinivil Zestril	 10 – 40 mg 10 - 40 mg		
	Ramipril / Altace*†	2.5 – 10 mg		
	Moexipril / Univasc†	3.75 - 15 mg		
	Perindopril/Aceon‡ Perindopril/ Indapamide combo (Coversyl)	2-16 mg 2 - 8 mg 0.625 - 2.5 mg		
	Quinapril /Accupril†	5 – 40 mg		
	Trandolapril/ Mavik Trandolapril/ Verapamil combo (TARKA)	1.0 – 4 mg 1-4 mg 180 to 240 mg		
ARBs -Angiotensin Receptor Blockers **Action** -Block AT-I receptor which reduces aldosterone secretion and vasoconstriction	Azilsartan/Edarbi Azilsartan/ Chlorthalidone combo (Edarbyclor)	40 - 80 mg 40 mg 12.5 - 25 mg	1 x daily	Try to take same time each day **Side effects**- Can cause dizziness, drowsiness, diarrhea, hyperkalemia, hypotension.
	Candesartan/Atacand†	8 – 32 mg		
	Eprosartan/Teveten†	400 - 600 mg		

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.

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+

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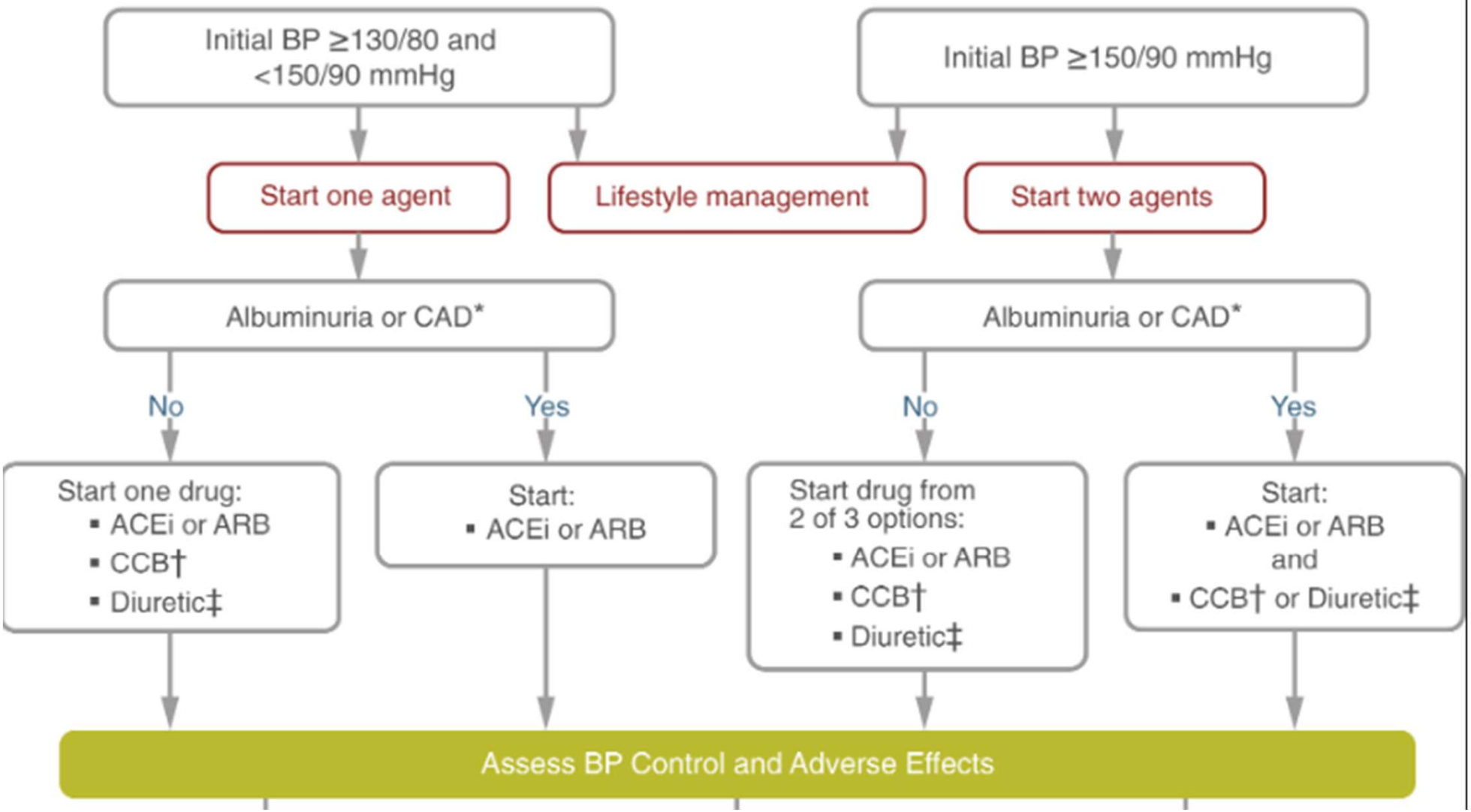
Recommendations for the Treatment of Confirmed Hypertension in Nonpregnant People With Diabetes



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

Poll Question 14

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 Monitoring and Lifestyle Treatment Strategies

- Lipid Goals
  - LDL < 70 or 55 based on risk
  - HDL >40
  - Triglycerides <150

Monitoring:
If **not** taking statins and underage of 40.
- check at time of diagnosis and every 5 yrs.

On statin
Monitor lipids at diagnosis and yearly.
Monitor lipids 4-12 weeks after statin dose adjustment.

- Weight loss if indicated
- Mediterranean or DASH Diet
- Reduction of saturated fat intake
- Increase of omega-3 fatty acids, viscous fibers and plant stanols/sterols
- Increase activity level
- BG lowering helps lower triglycerides and increase HDL

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

Statin Therapy

- Moderate intensity (lowers LDL 30-50%)
  - atorvastatin (Lipitor) 10-20mg
  - rosuvastatin (Crestor) 5-10mg
  - simvastatin (Zocor) 20-40mg
  - pravastatin (Pravachol) 40 – 80mg
  - lovastatin (Mevacor) 40 mg
  - fluvastatin (Lescol) XL 80mg
  - pitavastatin (Livalo) 1-4mg
- High intensity statins (lowers LDL 50%):
  - atorvastatin (Lipitor) 40-80mg
  - rosuvastatin (Crestor) 20-40mg

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

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

Lipid Therapy in Diabetes by Age

- All ages 20+ *with* ASCVD, add high-intensity statin to lifestyle
- 20–39 and additional ASCVD risk factors
  - may be reasonable to initiate statin therapy in addition to lifestyle.
- 40-75 years
  - Moderate to high intensity statin based on risk (see previous slides)
- 75 years or older and already on statin
  - it is reasonable to continue statin treatment.
- 75 years or older
  - it may be reasonable to initiate moderate-intensity statin therapy after discussion of potential benefits and risks.

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

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  - 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?

Wait, What About Emotions?

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

Adults with type 1 diabetes experienced reductions in diabetes distress and HbA_{1c} after participating in a virtual emotion-focused and/or education/behavioral program

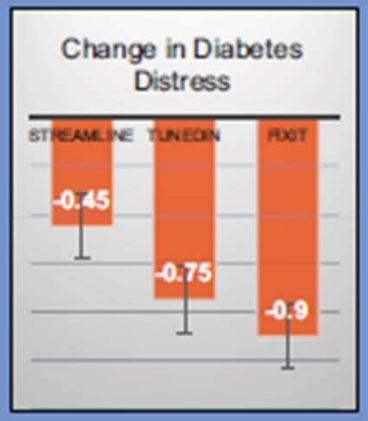
EMBARK: a randomized, controlled clinical trial comparing three interventions aimed at reducing diabetes distress and improving HbA_{1c} among adults with type 1 diabetes.

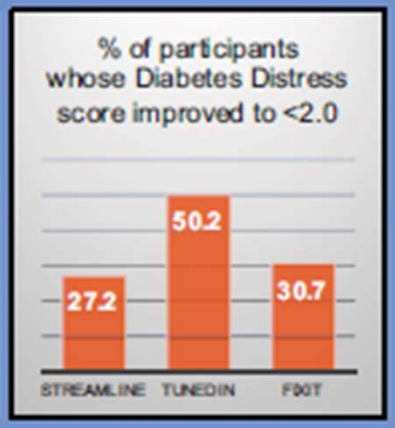
Streamline, an educator-led education and management program

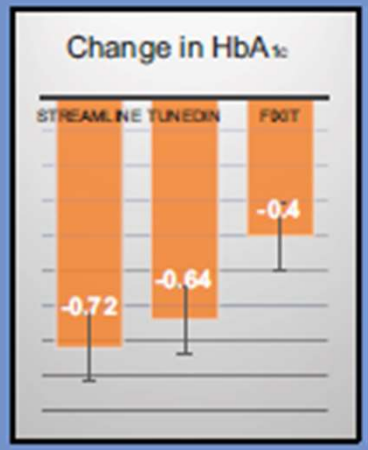
TunedIn, a psychologist-led program focused exclusively on the emotional side of diabetes

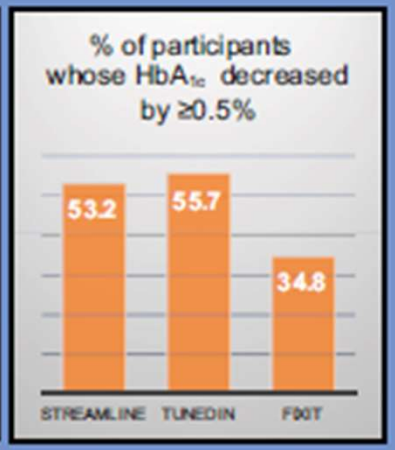
FixIt, an integration of Streamline and TunedIn.

- All interventions were group based and virtual over 3–4 months.
- Recruitment occurred through clinics and community organizations in the United States.









All three programs demonstrated substantive and sustained reductions in Diabetes Distress and HbA_{1c} at 12-month follow-up.

TunedIn, the emotion-focused program, had the most consistent benefits across both Diabetes Distress and HbA_{1c}.

Group-based, fully virtual, and time-limited programs like these can augment and enhance existing care.

Findings highlight the value of using emotion-focused strategies, like those used in TunedIn, for adults with type 1 diabetes to augment and enhance existing care.

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

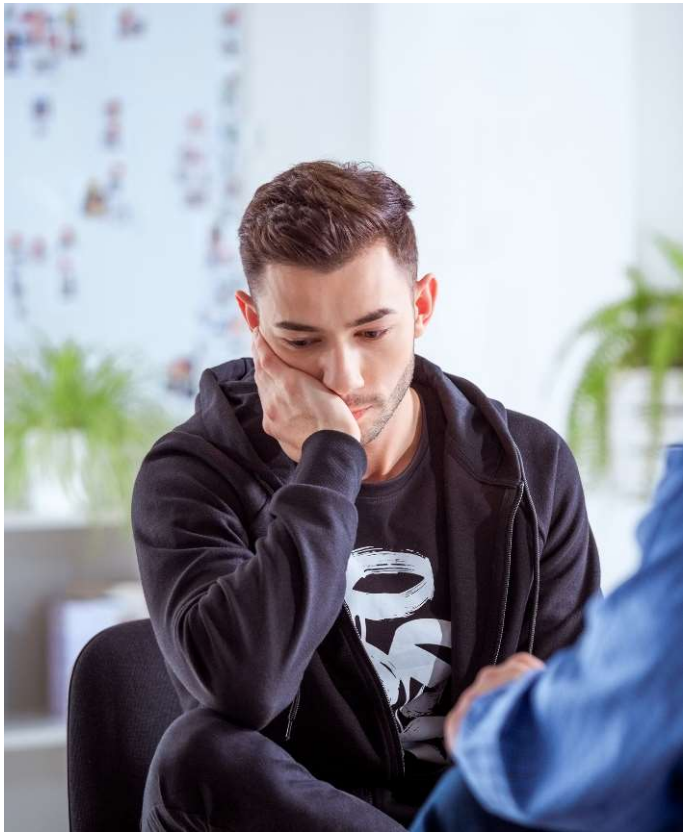
Impact of Embark Trial

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

~ Coach Beverly

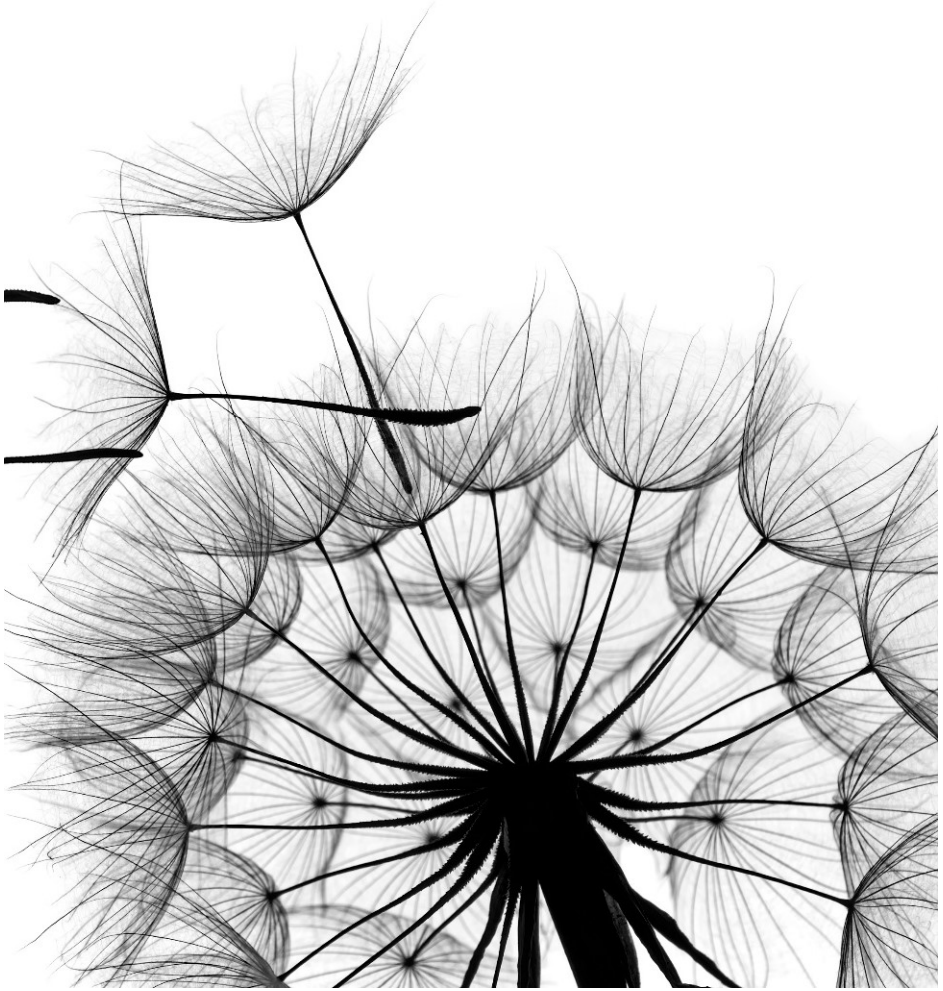
Embark Trial Takeaways

- 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.



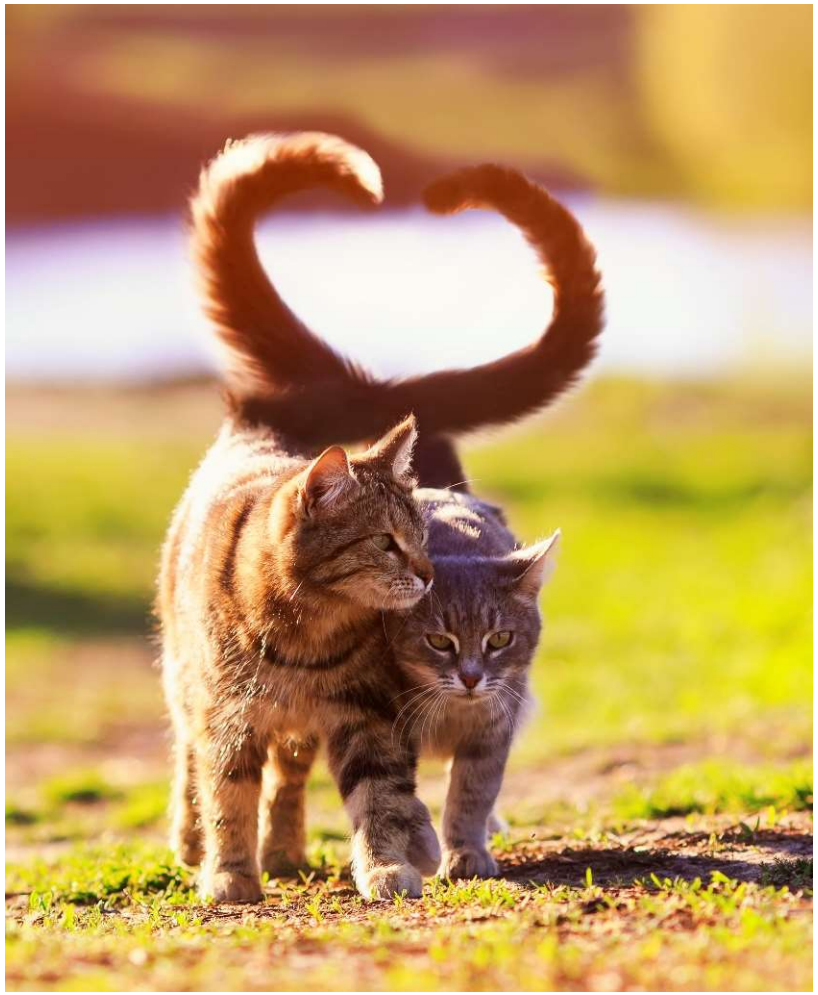
Releasing the Brake

- 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 2024 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.

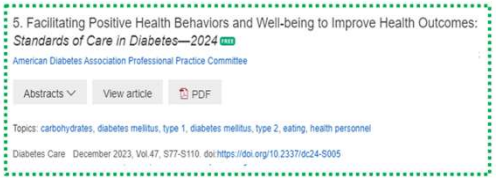
Emotion Based Approach and DD

Diabetes Distress – Assess Annually

Type 1 Diabetes Distress Scale (T1-DDS)

Instructions: Living with type 1 diabetes can be tough. Listed below are a variety of distressing things that many people with type 1 diabetes experience. Thinking back over the past month, please indicate the degree to which each of the following may have been a problem for you by circling the appropriate number. For example, if you feel that a particular item was not a problem for you over the past month, you would circle 1. If it was very tough for you over the past month, you might circle 6.

		Not a problem	Slight problem	Moderate problem	Somewhat serious problem	Serious problem	Very serious problem
1	Feeling that I am not as skilled at managing diabetes as I should be.	☐1	☐2	☐3	☐4	☐5	☐6
2	Feeling that I don't eat as carefully as I probably should.	☐1	☐2	☐3	☐4	☐5	☐6
3	Feeling that I don't notice the warning signs of hypoglycemia as well as I used to.	☐1	☐2	☐3	☐4	☐5	☐6
4	Feeling that people treat me differently when they find out I have diabetes.	☐1	☐2	☐3	☐4	☐5	☐6
5	Feeling discouraged when I see high blood glucose numbers that I can't explain.	☐1	☐2	☐3	☐4	☐5	☐6
6	Feeling that my family and friends make a bigger deal out of diabetes than they should.	☐1	☐2	☐3	☐4	☐5	☐6
7	Feeling that I can't tell my diabetes doctor what is really on my mind.	☐1	☐2	☐3	☐4	☐5	☐6
8	Feeling that I am not taking as much insulin as I should.	☐1	☐2	☐3	☐4	☐5	☐6
9	Feeling that there is too much diabetes equipment and stuff I must always have with me.	☐1	☐2	☐3	☐4	☐5	☐6
10	Feeling like I have to hide my diabetes from other people.	☐1	☐2	☐3	☐4	☐5	☐6
11	Feeling that my friends and family worry more about hypoglycemia than I want them to.	☐1	☐2	☐3	☐4	☐5	☐6
12	Feeling that I don't check my blood glucose level as often as I probably should.	☐1	☐2	☐3	☐4	☐5	☐6
13	Feeling worried that I will develop serious long-term complications, no matter how hard I try.	☐1	☐2	☐3	☐4	☐5	☐6
14	Feeling that I don't get help I really need from my diabetes doctor about managing diabetes.	☐1	☐2	☐3	☐4	☐5	☐6
15	Feeling frightened that I could have a serious hypoglycemic event when I'm asleep.	☐1	☐2	☐3	☐4	☐5	☐6
16	Feeling that thoughts about food and eating control my life.	☐1	☐2	☐3	☐4	☐5	☐6
17	Feeling that my friends or family treat me as if I were more fragile or sick than I really am.	☐1	☐2	☐3	☐4	☐5	☐6
18	Feeling that my diabetes doctor doesn't really understand what it's like to have diabetes.	☐1	☐2	☐3	☐4	☐5	☐6
19	Feeling concerned that diabetes may make me less attractive to employers.	☐1	☐2	☐3	☐4	☐5	☐6
20	Feeling that my friends or family act like "diabetes police" (bother me too much).	☐1	☐2	☐3	☐4	☐5	☐6



5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: *Standards of Care in Diabetes—2024*

American Diabetes Association Professional Practice Committee

Abstracts | View article | PDF

Topics: carbohydrates, diabetes mellitus, type 1, diabetes mellitus, type 2, eating, health personnel

Diabetes Care December 2023, Vol.47, S77-S110. doi:https://doi.org/10.2337/dc24-S005

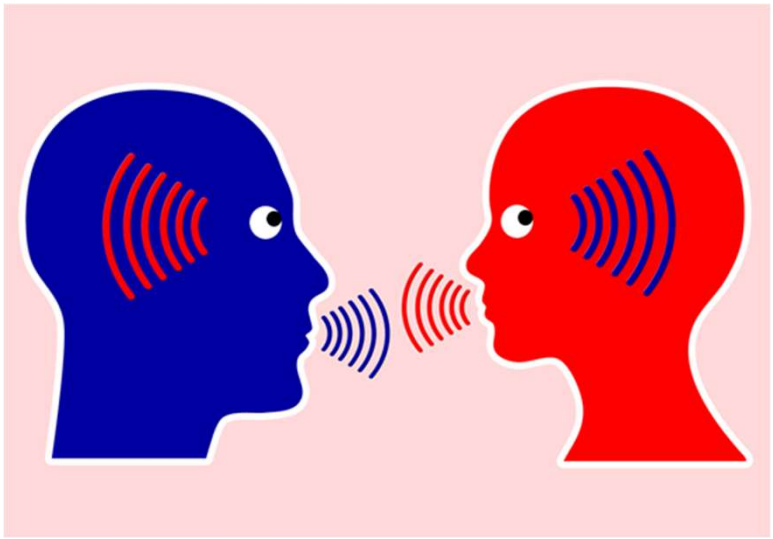
www.behavioraldiabetes.org

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

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!



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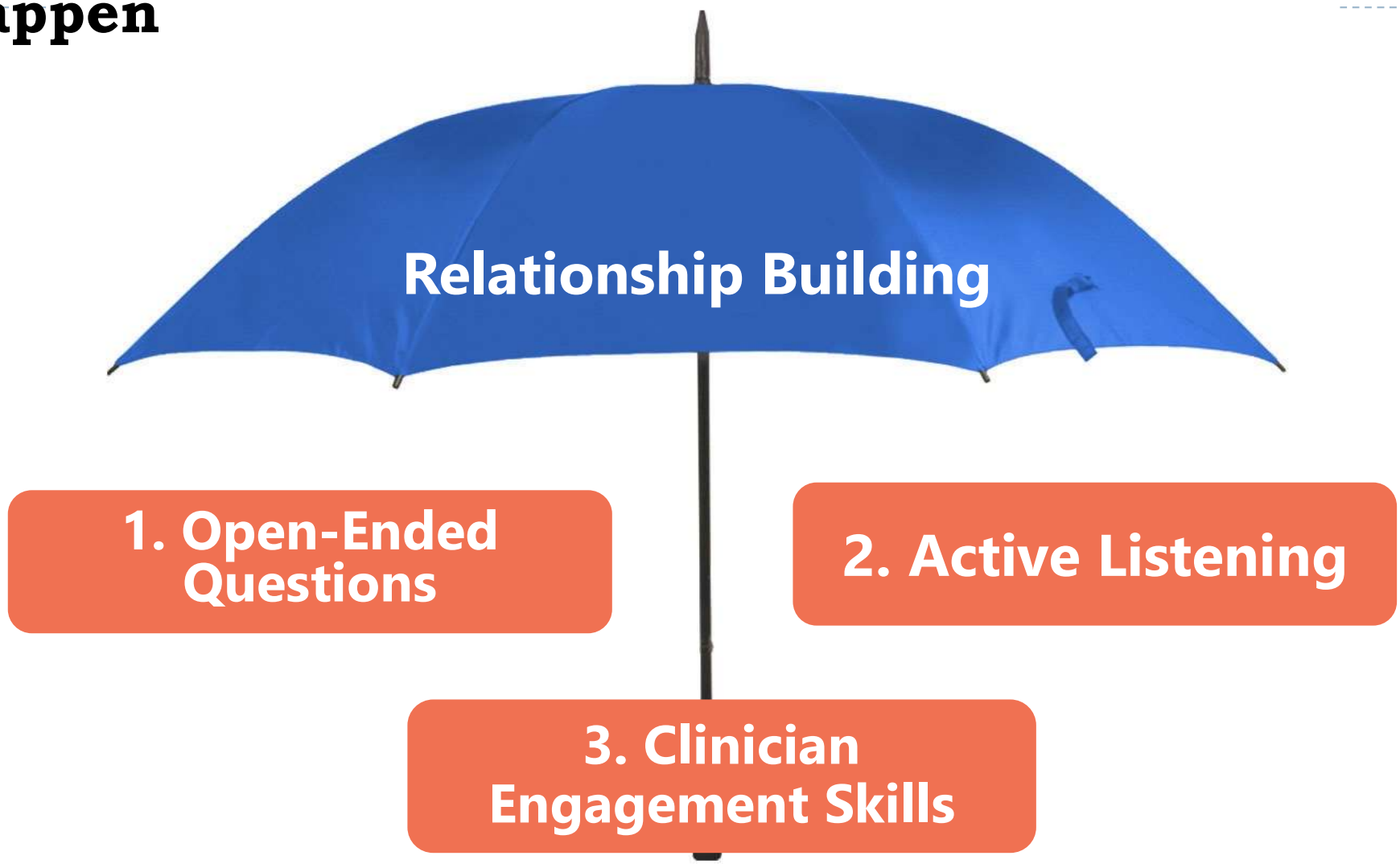
Relationship Building | Three Tools To Make It Happen



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Tools | #1. Open-Ended Questions

What are *closed-ended* questions?

Answers have to do with short, fixed responses (*that then require a clinician to then ask the next question*).

- Examples of *closed-ended* questions:
  - - What kind of exercise do you like to do?
    "Walk!"

    - How often do you walk? "3-times a week."

    - How often do you check your BG?

    "Five times a day."

Closed-ended questions <u>do not</u> help address DD.

Tools | #1. Open-Ended Questions

What are *open-ended* questions?

Questions that ask "how, what, why."

They require a more detailed response.

Examples:

"How do you respond when you go low?"

"What worries you the most about your diabetes?"

"What sense do you make of these BG numbers?"

"Why do you think that you are having trouble lowering your BG levels? What might be going on?"

Open-ended questions sometimes make clinicians nervous(never know what the response might be) –but they open the door to a more effective clinical conversation.

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

Tools | #2. Active Listening

What is “active listening?”

- Listen attentively – talk much less (< 50%).
- Alter tone and pace of speech (tolerate silences).
- Attend to the position of HCP and PWD in the room.
- Maintain eye contact (engage physically).
- Prevent computer, charts, papers, from distracting.

Create an atmosphere of engaged, empathetic, and attentive listening.

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Tools | #3. Clinical Engagement Skills

Based on MI, empowerment, autonomy support:

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Clinical Engagement Tools: Label & Address Feelings

- Many people are unaware of what they feel.
- Many feel many things at the same time – hard to separate and label each (anger and self-blame).
- Many are ashamed or embarrassed about what they feel – "I shouldn't feel this way."
- Listen carefully for underlying feelings throughout the conversation.

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Clinical Engagement Tools: Label & Address Feelings

TOOL: Sprinkle feeling words throughout the conversation.

- Use the conversation to focus on feelings – label them explicitly.
- Practice using these words – pick ones that fit your style.
- Expect some people to be surprised at your use of feeling words (no one ever talked to them this way).
- Don't worry about saying the wrong feeling word – they will correct you.
- Examples:

  "Sounds like you were really *frustrated* about …"

  "You must have ended up feeling *disappointed* …"

  "Perhaps you were feeling it was *your fault* anyway, yet you seem to be angry at them at the same time."

Clinical Engagement Tools: Label & Address Feelings

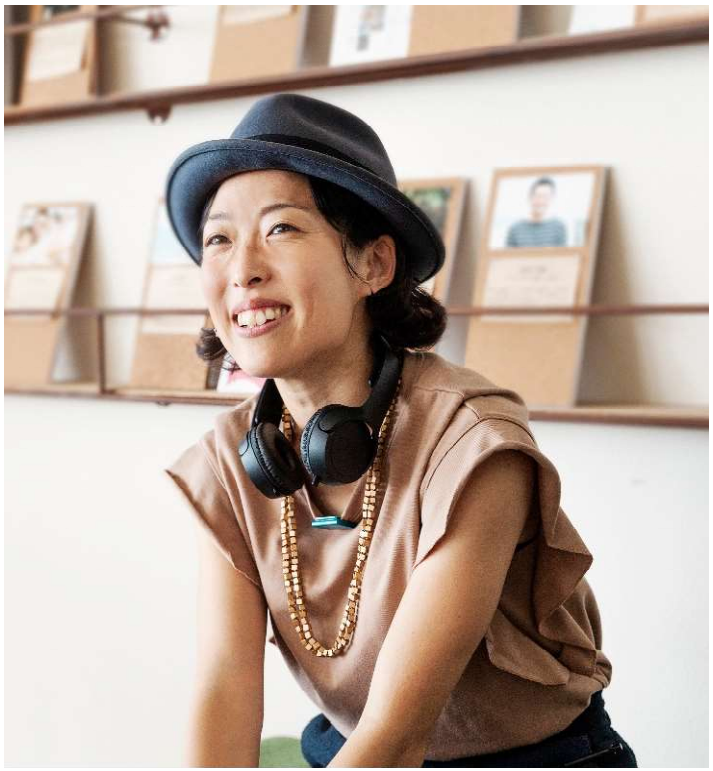
Common feeling words:

- 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

Clinical Engagement Tools: Summarize & Reflect

- It helps the PWD know that you are listening carefully and are interested.
- It helps them know that you understand & accept without judgement.
- It helps them to evaluate and consider their own experience – it becomes more objective, since the repetition comes from you (from outside of their own head).
- It helps them consolidate/integrate their experience, feelings and reactions (puts the entire picture together).



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Clinical Engagement Tools: Summarize & Reflect

TOOL: Periodically summarize and repeat back without judgement.

- Do not fix or correct anything, even if it might be factually incorrect.
- Add feeling words, even if they were not used originally.
- Emphasize that this is a way to make sure that you understand and have it right.

"So you are saying that … Do I have that right?"

"Let me see if I understand (this happened, that happened, you reacted, etc.; that must have left you feeling..."

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Clinical Engagement Tools: Normalize & Accept

TOOL: Comment often that how they feel makes sense, that their feelings and experiences are very common among PWDs, and that it is OK that they feel this way – *it is just being human and having tough feelings about a tough disease*.

"Anyone going through this would feel the same way"
"Many of the people I see with diabetes feel exactly the way you do."
"If I were in your shoes, I'd probably feel the same way."
"It makes sense that you would feel that way, given what is happening."

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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?"

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

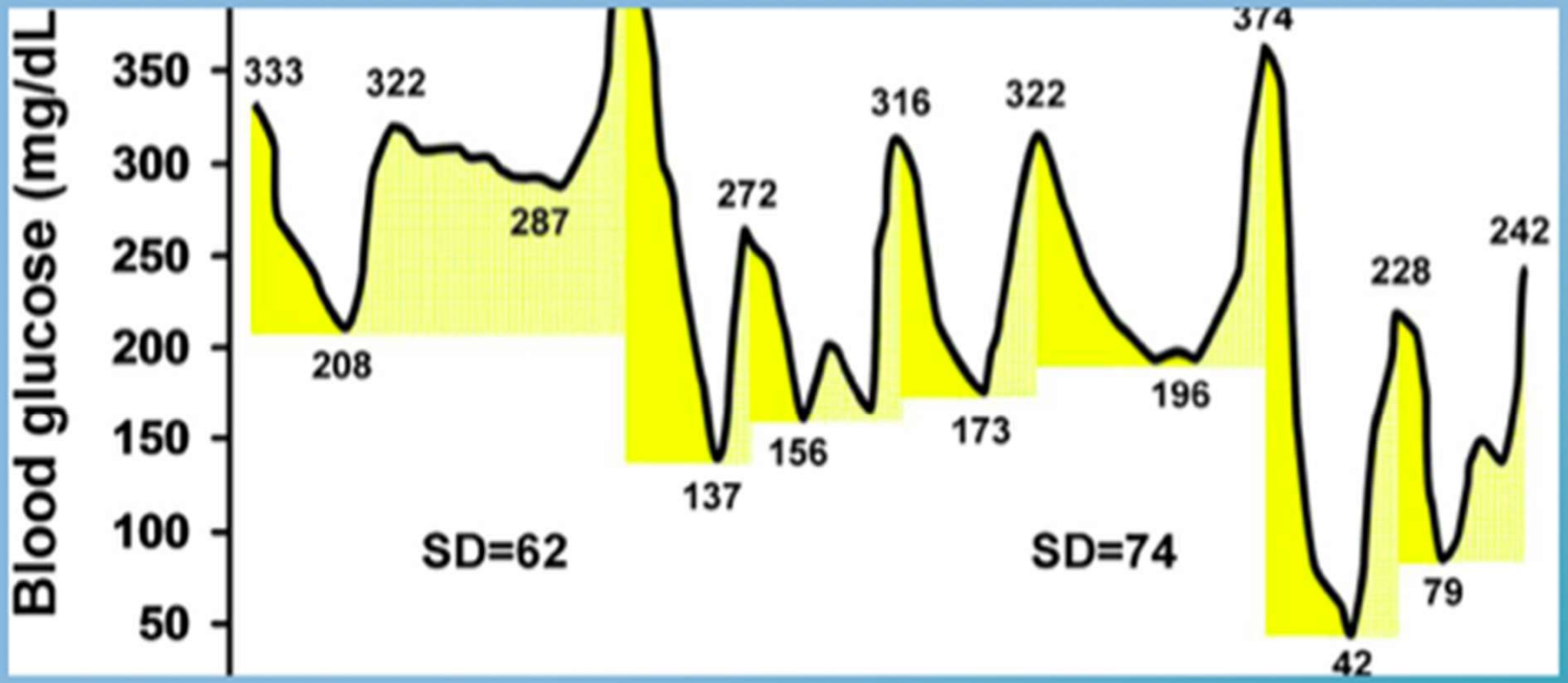
- Have you noticed if certain foods tend to increase your elevating your blood glucose?

- MR says “when I eat shrimp”.

- What do you say then?

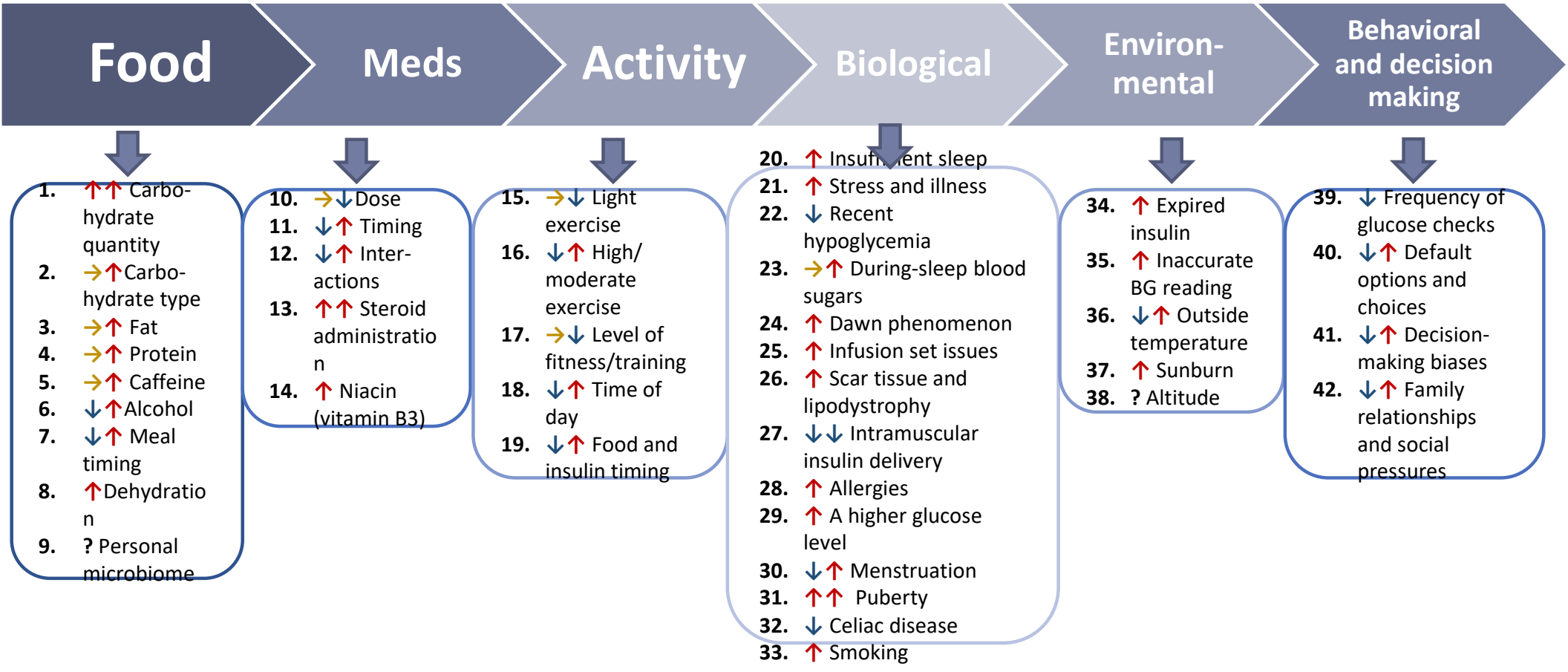
Blood Sugars with Diabetes

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.



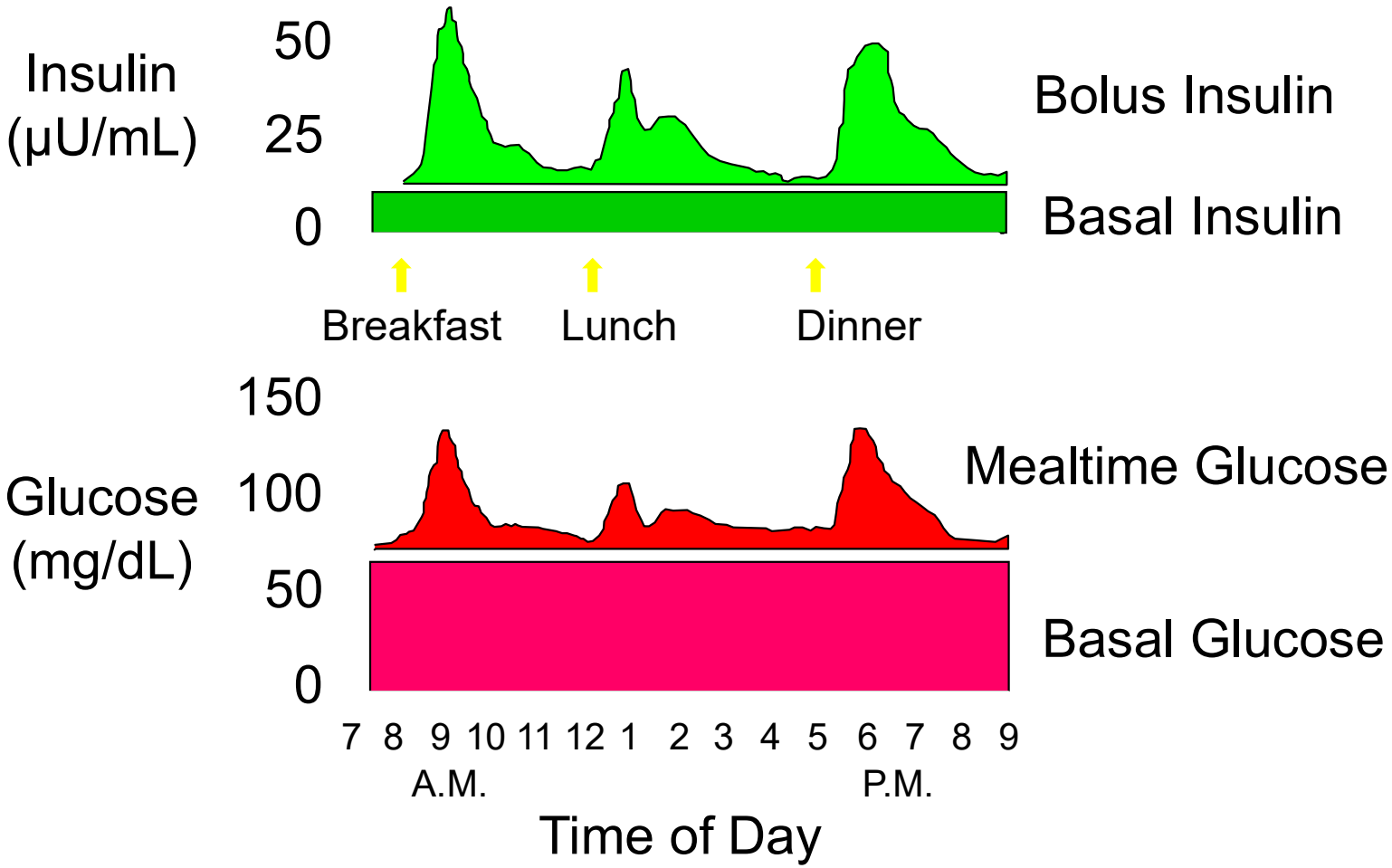
Glucose Variability F. John Service Diabetes 2013 May; 62(5): 1398-1404.
https://doi.org/10.2337/db12-1396

At least 42 factors affect glucose!



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

Physiologic Insulin Secretion: 24-Hour Profile



BGM vs CGM

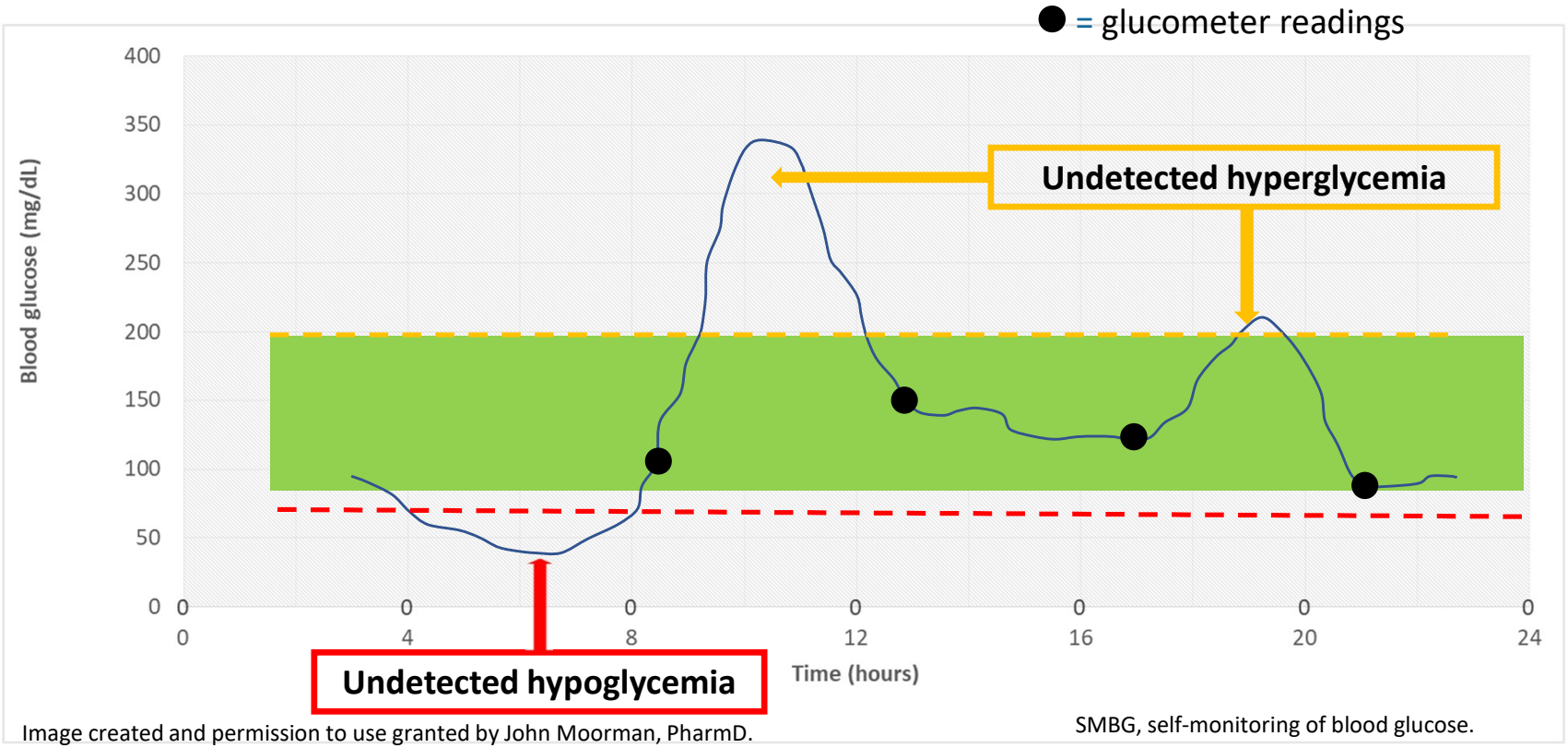
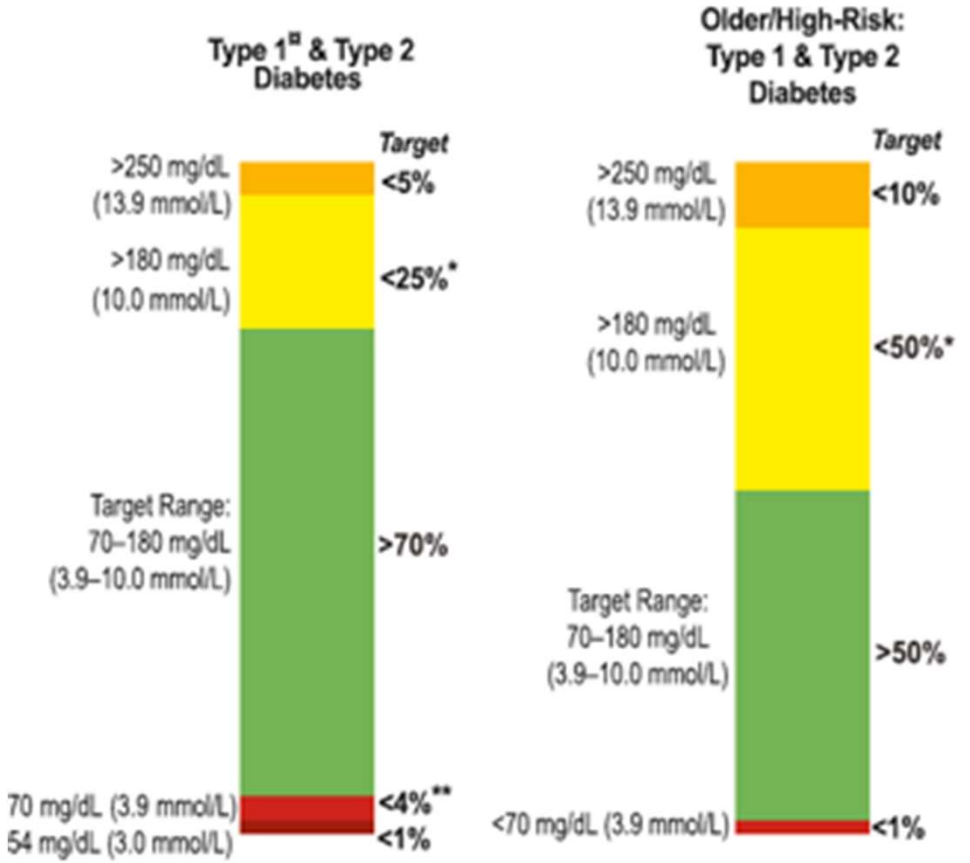


Image created and permission to use granted by John Moorman, PharmD.

SMBG, self-monitoring of blood glucose.

Time in Range

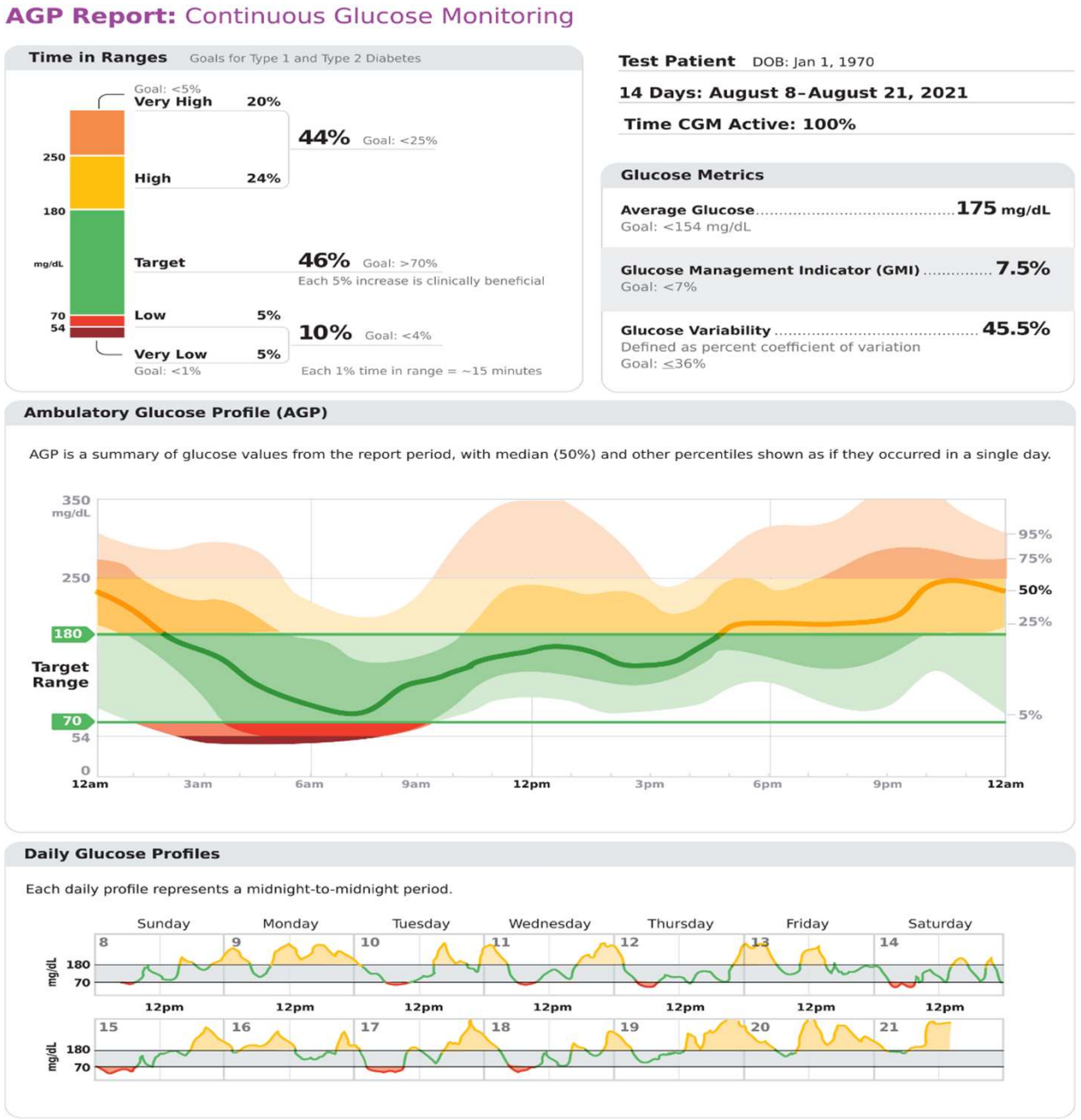
- Evaluate Time in Range (TIR)
  - Target 70-180 mg/dl
  - Target time *below* goal
    - Less than 70
    - Less than 54
  - Target time *above* goal
    - Above 180
    - Above 250



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

Ambulatory Glucose Profile Report

- CGM key metrics
- AGP
- Daily tracings



Examples of More Helpful Expectations

- Perfect isn't possible and you don't need to be (healthy good enough) *"Do you have to be perfect to be healthy?"*
- Having a tough time with a tough disease is normal. *"Most people with DM find it tough going – this is not you, it is diabetes."*
- You are not alone if you struggle with diabetes and/or have challenges with the emotional side of diabetes

<u>These more helpful expectations are about keeping diabetes in perspective</u>

Help Establish Helpful Expectations

What to do:

- Acknowledge the common DD Story *("Many people with diabetes struggle with trying to be perfect.")*

- Connect their story to the unhelpful expectations that keeps them stuck *("Trying to be perfect often leads to frustration and burnout and makes people stop trying.")*

- Discuss an alternative expectation for consideration *("An alternative to perfectionism is shooting for a goal that is ambitious but realistic.")*

Unhelpful Expectations are Part of DD Stories (See Handout) and Lead to Unhelpful Conclusions

DD Stories and Unhelpful Conclusions

- I'm a bad diabetic (Am powerless to change)
- I can't do this right or perfect. (So why bother trying?)
- I'm an idiot/can't do this/failure. (Am powerless)
- I'm a burden. (Need to keep to self)
- I'm broken/defective. (May be rejected)
- I'm doomed (No point in trying/Am powerless)

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?

Having A Different Kind Of Conversation

Establish a “judgement-free” environment.
Most have never been asked how they feel or think about their diabetes and can elicit painful feelings and thoughts.

We may not be used to hearing & tolerating this (painful and uncomfortable for us too)

- May want to jump in and make them feel better
- May feel that you don’t have the time for this or that it is not part of your professional role
- Remember: you do not have to “fix” them (no need to rescue them, solve it, or make them feel better – just elicit the story)

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

Having the Conversation

Listen for major common themes:

- Hopelessness/powerlessness: “No matter what I do, I can’t control my diabetes”
- Negative self- judgement: “It is all my fault – I am a bad diabetic. I should be able to do it by now.”
- Shame: “I don’t tell people I have diabetes.” “I keep my challenges to myself.”
- Burden: “I am a burden on my family, friends and the healthcare system.”
- “I am broken” (damaged goods): “I am not as attractive to others because of diabetes”
- Doom/Fatalism: “I am destined for terrible complications”

Having the Conversation

Use The Conversational Tools:

- Reflect often with empathy and use “feeling” words: “That must have really frustrated you.” “You must have been so angry.”
- Common “feeling” words: anger, fear, frustration, exhaustion, sad, embarrassed, guilty, overwhelmed, etc. They will correct you if you are wrong.
- Listen for how they are self-critical and beat themselves up (I’m a bad diabetic.” “I should know this by now.”).

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?
- 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

ReVive5 WORKSHEET

1. Looking at your T1DDS, what are your highest subscales?
2. Let's take a look at the items in those scales? Do any really stand out for you?
3. Looking at these items, can you think of a situation or an event that happened recently that captures a particular item?
   a) DD item
   b) Recent event or circumstance that captures this item. What happened?
   c) In this example, ideally what would you *really* want to happen?
   d) When you reflect on this situation and what actually happened, this is what you felt/thought (DD story).
   e) So, this is what you did (choices made) and how it turned out.

Describe a recent event that captures a DD item:

- 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

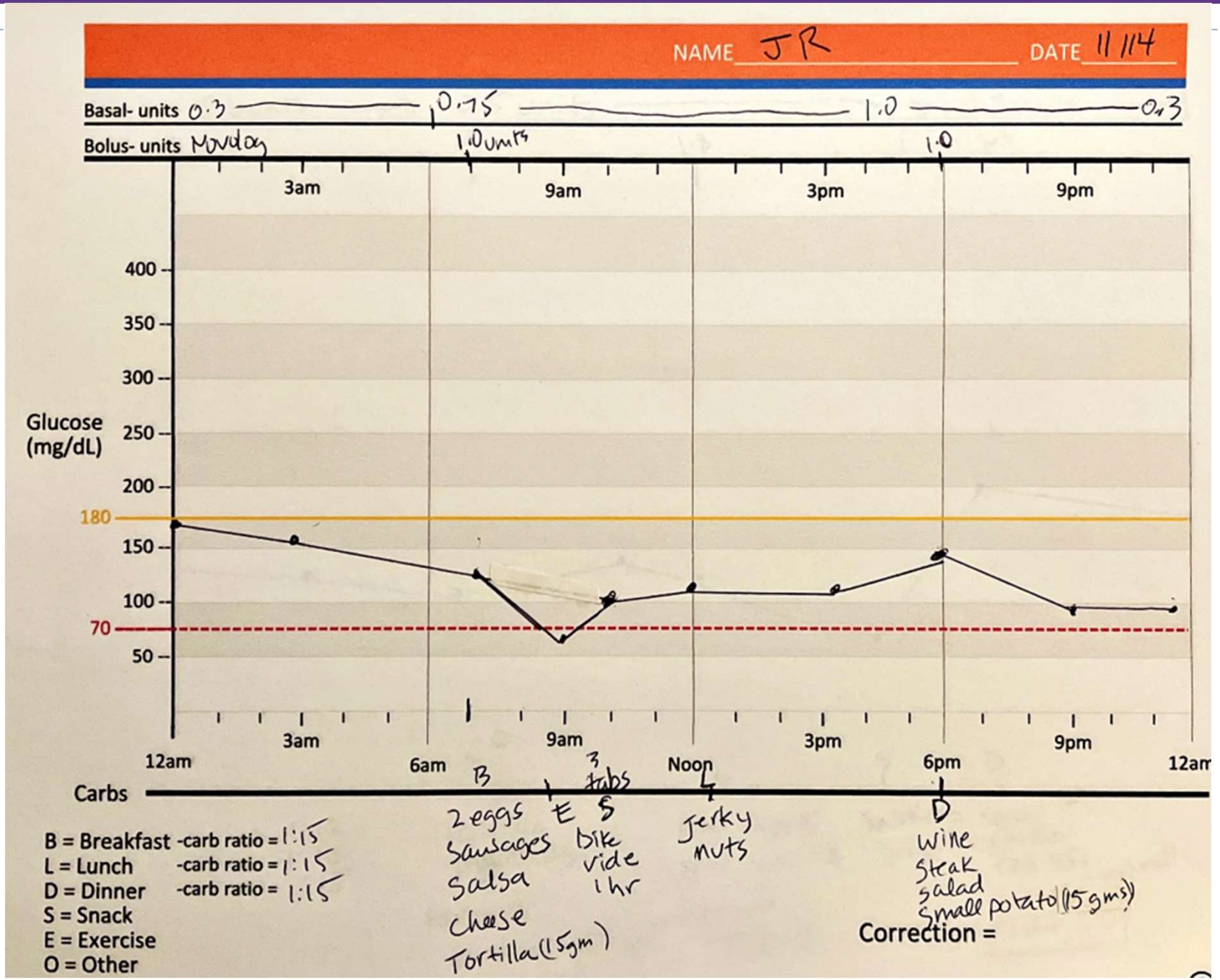
Over the past month, JR's blood sugar has dropped below 70 while bike riding at least 3 times.

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

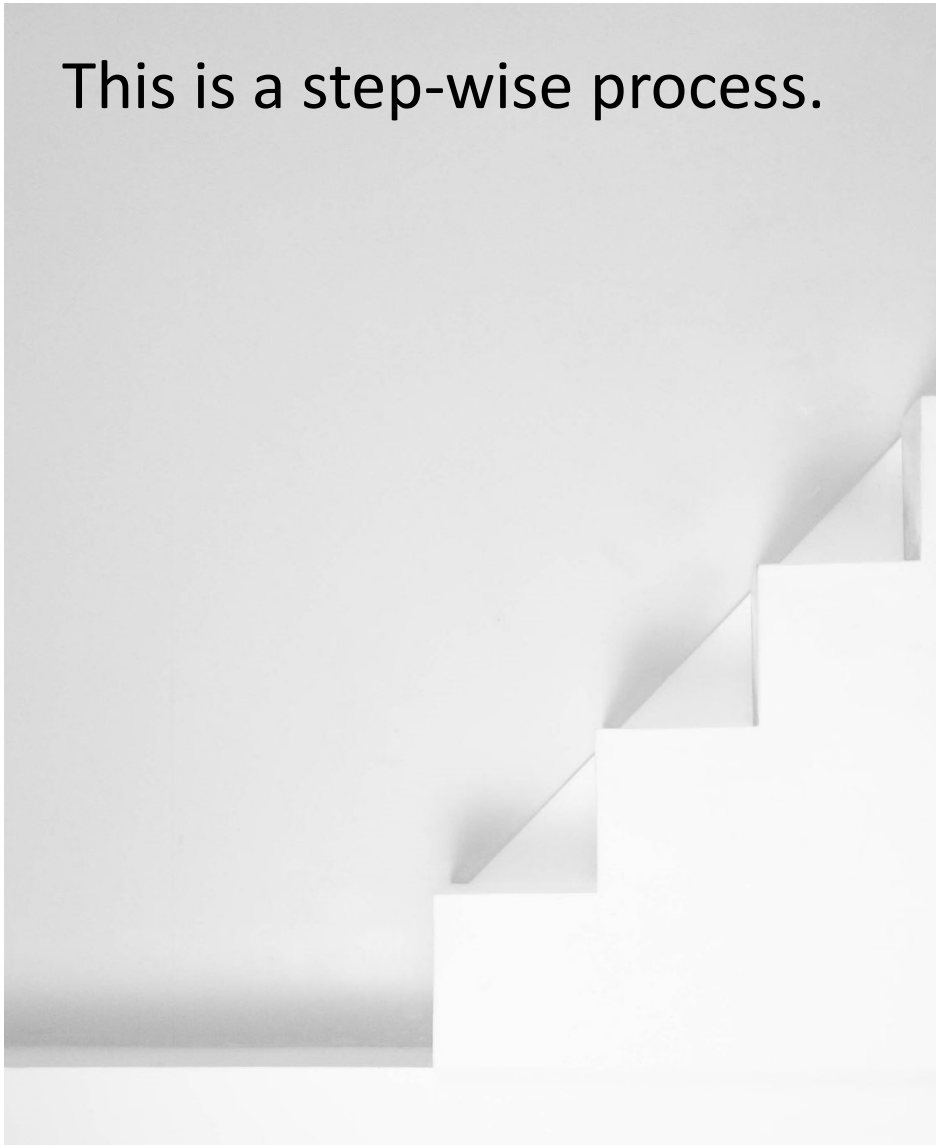
Make sure that the change they make is VERY specific.

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.



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

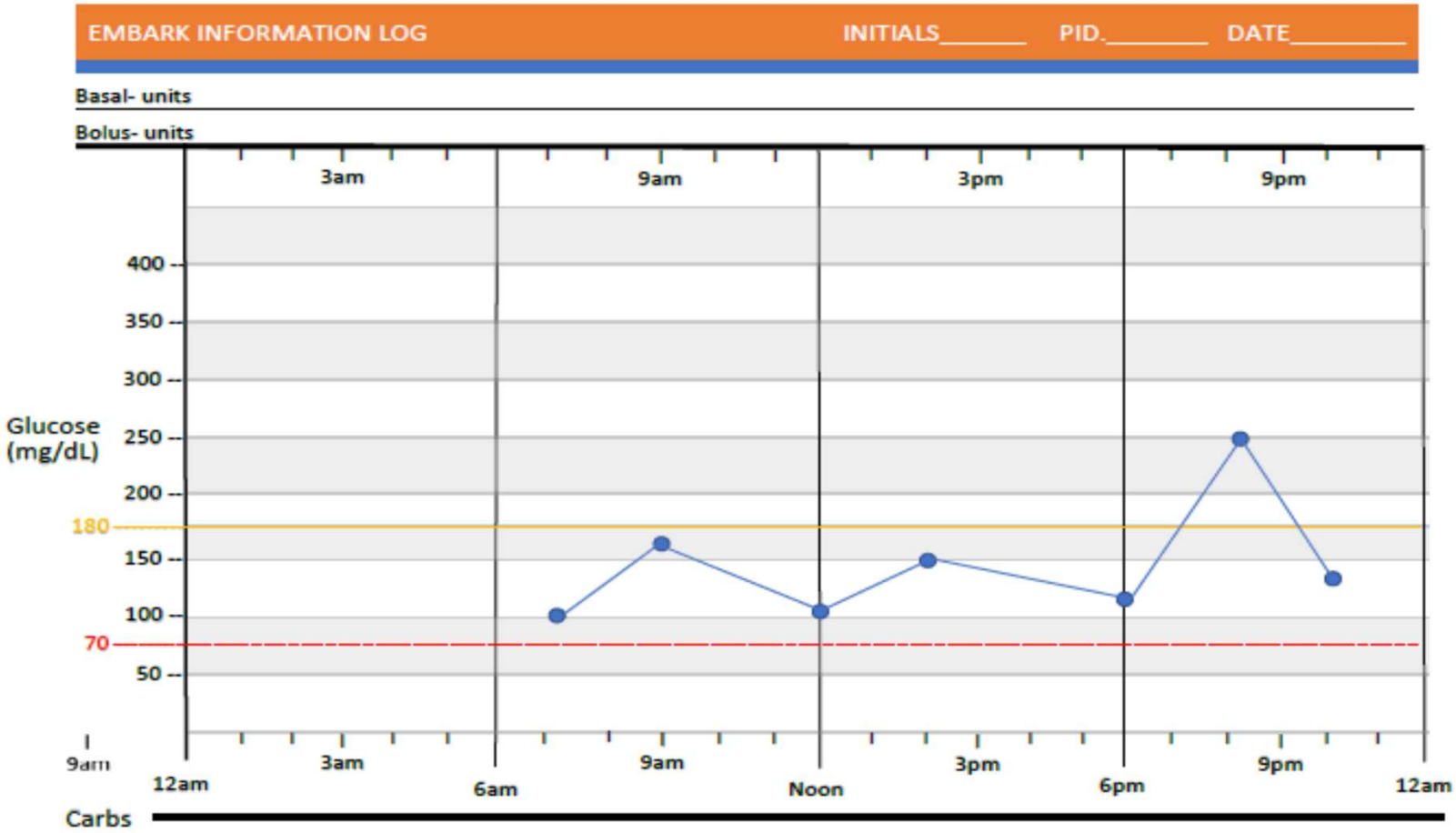
- Yes, I noticed my worry as I prepared for my ride.
- I put my pump on exercise mode when I started my ride. I got a little low at first, had some glucose tabs, and then things stabilized.
- Next time, I will start with a higher BG plus put my pump on exercise mode.

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).

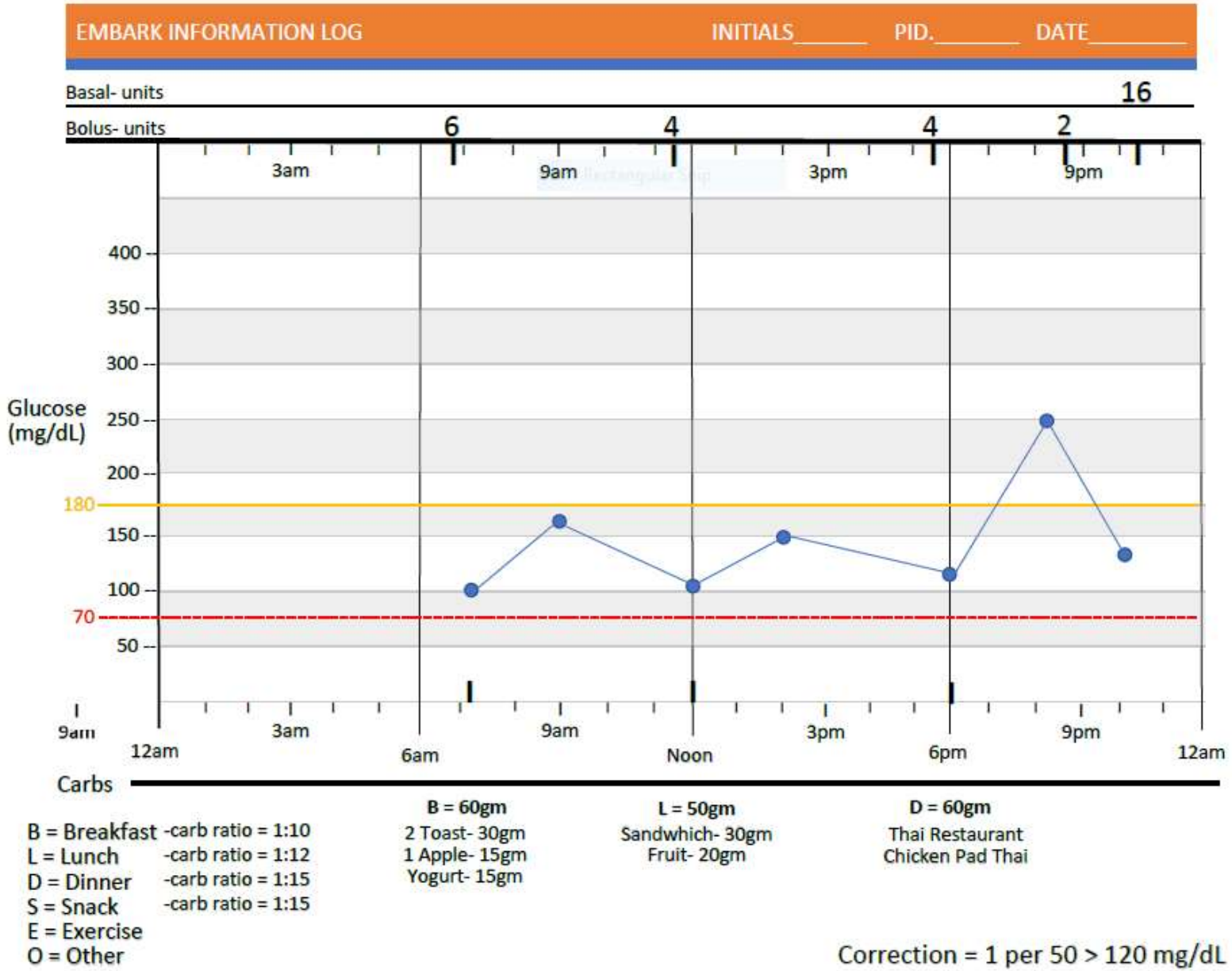
What is happening here?



B = Breakfast -carb ratio = 1:10
L = Lunch -carb ratio = 1:12
D = Dinner -carb ratio = 1:15
S = Snack -carb ratio = 1:15
E = Exercise
O = Other

Correction = 1 per 50 > 120 mg/dL

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.

Diabetes Bingo
“DiaBingo” Shout out Right Answer

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 One % drop in A1c reduces risk of complications by ___ %

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

Mahalo

- Questions?
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Diabetes Education SERVICES