Diabetes 101: A Call to Action for Primary Care Providers

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Disclosures

- **I have no relevant relationships with ineligible companies to disclose within the past 24 months.**

Moonlighting as pancreas 24/7/365 for the past 33 years

Patient Perspective ⟺ *Provider Perspective*

Learning Objectives

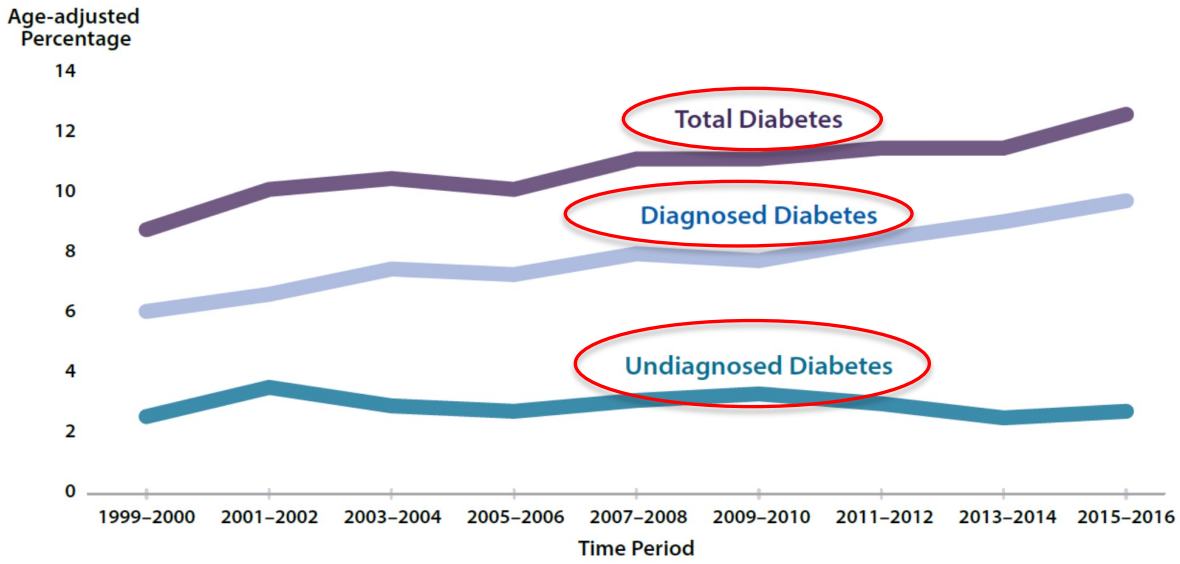
At the end of the presentation, the participant will be able to:

- ***Review epidemiology, risk factors, screening tools & diagnostic criteria for prediabetes & diabetes***
- ***Probe the relationships between prediabetes & diabetes to CVD, CKD, & other complications***
- ***Explore the role of the primary care provider within the context of consensus guidelines for diabetes care & diabetes self-management skills, education & support (DSMES)***
- ***Formulate evidence-based treatment plans within case-based scenarios based on cardiovascular outcome trials (CVOT) results & consensus guidelines for diabetes care***

Epidemiologic Trends of Diabetes; 1999-2016

- **Diabetes :** 34.2 million people have diabetes (10.5% of US population)
  - **Diagnosed:** 26.9 million people
  - **Undiagnosed:** 7.3 million people

Figure 1. Trends in age-adjusted prevalence of diagnosed diabetes, undiagnosed diabetes, and total diabetes among adults aged 18 years or older, United States, 1999–2016.

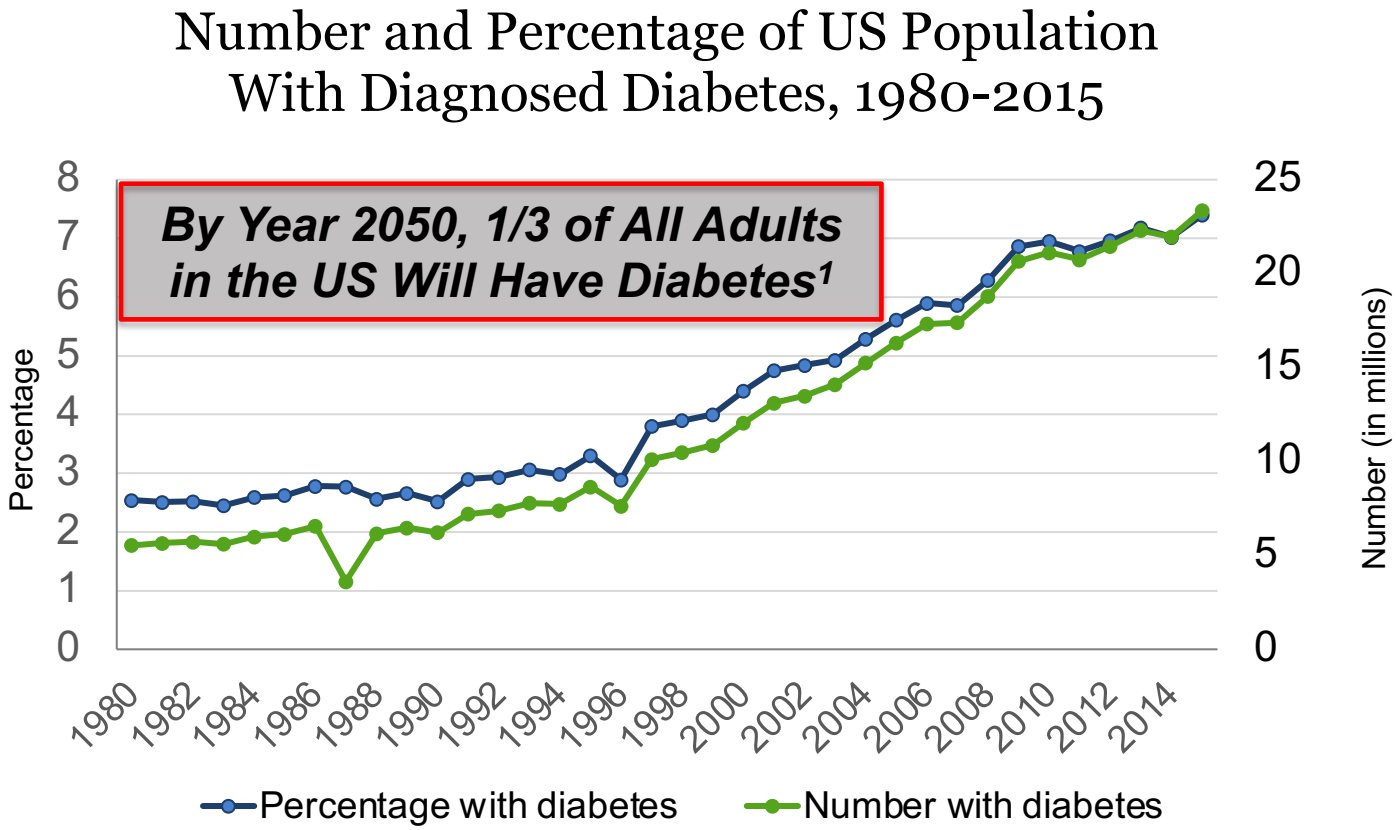


Notes: Diagnosed diabetes was based on self-report. Undiagnosed diabetes was based on fasting plasma glucose and A1C levels among people self-reporting no diabetes.

Data source: 1999–2016 National Health and Nutrition Examination Surveys.

[1]Centers for Disease Control and Prevention. National Diabetes Statistics Report, 2020. Dept of Health and Human Services. Accessed January 12, 2021. https://www.cdc.gov/diabetes/data/statistics-report/index.html

The Bad News: Diabetes Epidemic Starts with Prediabetes



[1]CDC's Division of Diabetes Translation. United States Diabetes Surveillance System available at http://www.cdc.gov/diabetes/data

The Good News

- 90% of all pre-diabetes & diabetes management occurs within the primary care setting
- Early intervention can reduce incidence & prevalence rates of complications associated with the disorder, reduce cost & improve long-term quality of life

Endocrine Practice, 2018; 24 (11)

General Classification Categories for Diabetes

- **Type 1 diabetes -** autoimmune ß-cell destruction, usually leads to insulin deficiency, including latent autoimmune diabetes of adulthood (LADA)

5%

- **Type 2 diabetes -** progressive loss of ß-cell insulin secretion frequently on background of insulin resistance

90-95%

- **Specific types of diabetes -** due to other causes, e.g., monogenic diabetes syndromes (neonatal diabetes & maturity-onset diabetes of the young (MODY), diseases of exocrine pancreas (cystic fibrosis & pancreatitis), & drug- or chemical-induced diabetes (glucocorticoid induced in HIV/AIDS, s/p organ transplant)

<1%

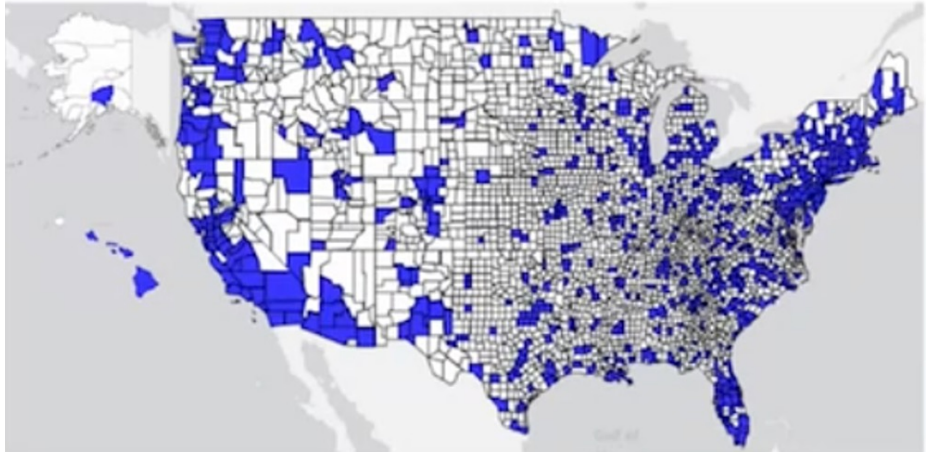
- **Gestational diabetes mellitus -** diagnosed in 2nd or 3rd trimester & not clearly overt diabetes prior to gestation

6-9%

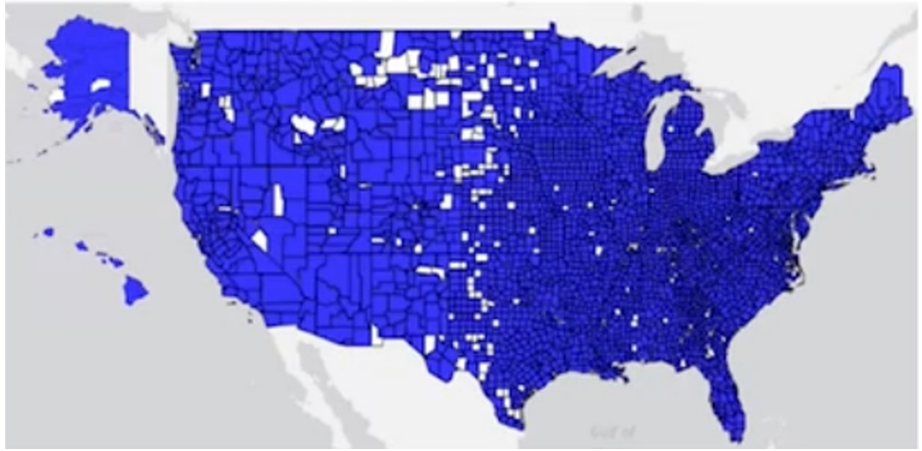
Classification and Diagnosis of Diabetes: *Standards of Medical Care in Diabetes - 2022. Diabetes Care* 2022;45(Suppl. 1):S17-S38

Distribution of Endocrinologists/Diabetologists & PCPs in US[1]

US Counties with ≥ 1
Pediatric or Adult Endocrinologist/Diabetologist



US Counties with ≥ 1
Primary Care Provider



Total PCPs in the US[2]:

PAs: 20%

NPs: 30%

MD/DOs: 50%

[1]Oser SM, Oser TK. Diabetes Technologies: We Are All in This Together. Clin Diabetes. 2020 Apr;38(2):188-189. doi: 10.2337/cd19-0046. PMID: 32327892; PMCID: PMC7164996.
[2]Petterson S, McNellis R, Klink K, Meyers D, Bazemore A. The State of Primary Care in the United States:

Role of Primary Care Provider

- **Engage & Explore**
- Screen & Monitor
- Use Technology
- Customize
- Support & Follow

Biopsychosocial Factors in Health

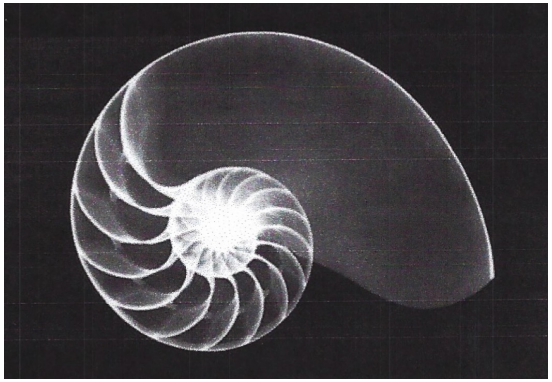
Psychological & Behavioral Factors

Biological Factors

Social & System Factors

Five Practices for Promoting Patient-Centered Care[1,2]

- Prepare with intention
- Listen intently & completely
- Agree on what matters most
- Connect with the patient's story
- Explore emotional cues



JW Chambered Nautilus Approach…

[1]Sanders L, Fortin AH 6th, Schiff GD. Connecting with patients—the missing links. JAMA. 2020;323(1):33-34
[2]Zulman DM, Haverfield MC, Shaw JG, et al. Practices to foster physician presence and connection with patients in the clinical encounter. JAMA. 2020;323(1):70-81.

Chronic Disease Management Engagement

What's the hardest thing right now?

What do you fear most?

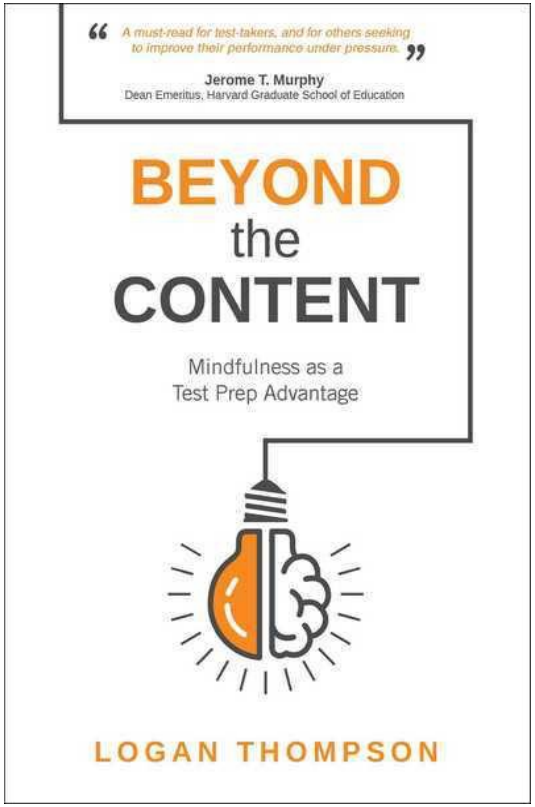
My story…

- **1st life – Biology teacher – 10 years**
  - Taipei American School, Taipei, Taiwan, ROC
- **2nd life – Physician Associate – 23+ years**
  - PA Student – 2.5 years
  - Internal Medicine Hospitalist PA – 13 years
  - Internal Medicine/Diabetes Care – 10 years
  - Yale School of Medicine faculty – 6 years
- **Type 1 DM – 32+ years**
  - Multi-dose injection (MDI) therapy – 15 years
  - CSII with insulin pump therapy – 17 years
  - CGM – 4 years

Hardest thing? What do you fear most?

- **How this will limit my life…**
- **What will I have to give up?**
  - Living overseas…
  - Traveling the world…
  - Adventure…
    - Scuba, Kayaking, Trekking, Sports, Exercise?
- **Is this the death of "spontaneity" in my life?…**

Recognizing the Impact of “Wilsons” & “Passengers”



- Naming allows to externalize “fleeting thoughts, feelings” & emotions”
- Helps allow them to be “understandable & workable”
- Some ”passengers” are helpful & some are not…
- The NOT so helpful are those that begin to control our behaviors

Thompson, Logan. Beyond the Content: Mindfulness as a Test Prep Advantage. 2019. Kaplan Publishing, New York, NY. ISBN: 978-1-5062-4847-9.

Acknowledgement & Affirmation

- Identification of Barriers
  - Based on patient's answers to your questions
- Use Metaphors – "This is hard…"
  - "Diabetes care is like managing a 3-ring circus…"
  - "Controlling BG is like trying to carry a flat pan of water across the floor without spilling a drop…"
- But…always give positive reinforcement
  - Underscore successes & reiterate support
  - "I'm in this alliance with you."

Patient-Centered Approach to DM Managment

Consider patient, disease features, psychology & social network that impact management

Hypoglycemia risk, disease duration, life expectancy, early signs of established vascular complications, etc.

Determine impact of features above on A1C goal & adjust therapeutic strategy accordingly

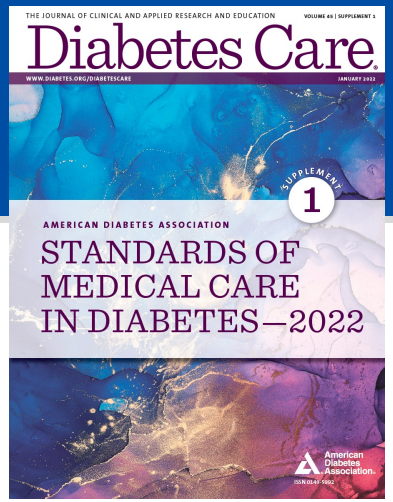
Revisit & readjust strategy as factors change

ADA.Glycemic Targets. Approach to Individualization of *Diabetes Care.* 2022;45(Suppl.1):S83-S96.

Role of Primary Care Provider

- Engage & Explore
- **Screen & Monitor**
- Use Technology
- Customize
- Support & Follow

2022 ADA Guidelines - Selected Revision Highlights



- **Screening for prediabetes & diabetes should begin at age 35**
- **Metformin therapy recommended for type 2 DM prevention**
  - Adults with prediabetes especially all aged 25–59 years with:
    - BMI ≥35 kg/m2
    - Higher A1C (e.g., >6.0%)
    - Higher fasting plasma glucose (e.g., >110 mg/dL)
    - Women with prior gestational diabetes mellitus
- **Integration of diabetes technology & self-management education & support (DSMES) for comprehensive diabetes care**
- **Individualized approaches should be 1st line therapy for patients**
  - Especially for comorbidities of DM and/or CAD, HF, CKD
  - Based on interventions most effective in reducing risk or progression
- **All adults with overweight or obesity should be referred to intensive lifestyle behavior change programs**

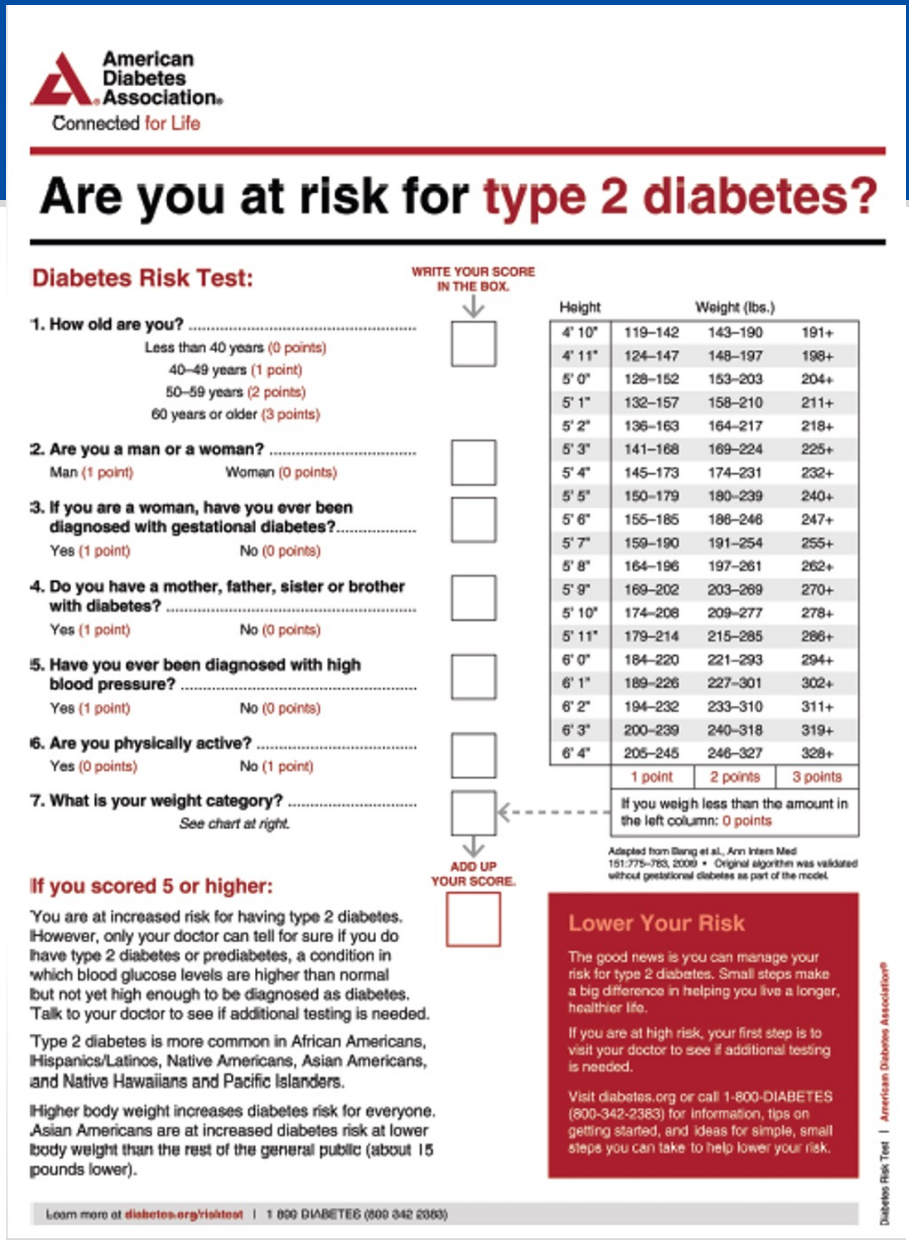
Summary of Revisions: *Standards of Medical Care in Diabetes - 2022. Diabetes Care* 2022;45(Suppl. 1):S4

Patients at Risk for Diabetes?

60-Second Type 2 Diabetes Risk Test
https://diabetes.org/socrisktest

Risk Factors:

- Weight
- Inactivity
- Family history
- Age
- Gender
- Gestational diabetes
- High blood pressure
- Polycystic ovary syndrome



American Diabetes Association.
Connected for Life

Are you at risk for type 2 diabetes?

Diabetes Risk Test:

WRITE YOUR SCORE IN THE BOX.

1. How old are you?
Less than 40 years (0 points)
40–49 years (1 point)
50–59 years (2 points)
60 years or older (3 points)

2. Are you a man or a woman?
Man (1 point) Woman (0 points)

3. If you are a woman, have you ever been diagnosed with gestational diabetes?
Yes (1 point) No (0 points)

4. Do you have a mother, father, sister or brother with diabetes?
Yes (1 point) No (0 points)

5. Have you ever been diagnosed with high blood pressure?
Yes (1 point) No (0 points)

6. Are you physically active?
Yes (0 points) No (1 point)

7. What is your weight category?
See chart at right.

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

If you weigh less than the amount in the left column: 0 points

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

ADD UP YOUR SCORE.

If you scored 5 or higher:

You are at increased risk for having type 2 diabetes. However, only your doctor can tell for sure if you do have type 2 diabetes or prediabetes, a condition in which blood glucose levels are higher than normal but not yet high enough to be diagnosed as diabetes. Talk to your doctor to see if additional testing is needed.

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

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

Lower Your Risk

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

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

Visit diabetes.org or call 1-800-DIABETES (800-342-2383) for information, tips on getting started, and ideas for simple, small steps you can take to help lower your risk.

Learn more at diabetes.org/risktest | 1 800 DIABETES (800 342 2383)

Diabetes Risk Test | American Diabetes Association®

Classification and Diagnosis of Diabetes: *Standards of Medical Care in Diabetes - 2022*. *Diabetes Care* 2022;45(Suppl. 1):S17-S38

Prediabetes Screening Criteria: Adults

- Age ≥ 35 years
- BMI ≥ 25 kg/m²*
  - PLUS 1 or more risk factors below
- 1st Degree relative with diabetes
- High risk racial or ethnic group: Asian American, African American, Latino, Native American & Pacific Islander
- History of gestational diabetes every 3yrs
- A1c 5.7% should be screened annually
- Fasting glucose > 100 mg/dL
- History of CVD
- HTN (BP > 140/90 mmHg or Rx for HTN)
- Dyslipidemia
  - HDL-C < 35 mg/dL
  - Triglycerides > 250 mg/dL
- Physical inactivity
- Increased waist circumference (race specific)
- Conditions associated with insulin resistance
  - PCOS, acanthosis nigricans, NAFLD
- Patients with HIV & Sleep disorders
- Medication use:
  - Antipsychotic therapy
  - Chronic glucocorticoid exposure

- **Screen at-risk individuals with glucose values in the normal range every 3 years**
- **Consider annual screening for patients with 2 or more risk factors**

*At-risk BMI may be lower in some ethnic groups; consider using waist circumference.

Classification and Diagnosis of Diabetes: *Standards of Medical Care in Diabetes - 2022. Diabetes Care* 2022;45(Suppl. 1):S17-S38

IFG = Impaired Fasting Glucose;
IGT = Impaired Glucose Tolerance;
NAFLD = Nonalcoholic Fatty Liver Disease;
PCOS = Polycystic Ovary Syndrome

Diagnostic Criteria for Prediabetes & Diabetes

Test	Normal	Prediabetes	Diabetes
Fasting Plasma Glucose (FPG)	< 100 mg/dL IFG	100-125 mg/dL	≥125 mg/dL[2]
2 Hour Plasma Glucose (PG) after OGTT	< 140 mg/dL IGT	140-199 mg/dL	≥200 mg/dL
A1C	< 5.6%	5.7 to 6.4% For screening of prediabetes[1]	≥6.5%
Random Plasma Glucose	<199 mg/dL		≥200 mg/dL[3]

[1]A1C only should be used for screening prediabetes. Diagnosis of prediabetes, manifested as either IFG or IGT, should be confirmed with glucose testing. Diagnosis should be confirmed on separate day by repeating glucose or A1C testing. When A1C is used for diagnosis, follow-up glucose testing should be done, when possible, to help manage diabetes.

[2]No caloric intake for at least 8 hrs.

[3]In patient with classic symptoms of hyperglycemia or hyperglycemia crisis

IFG = impaired fasting glucose
IGT = impaired glucose tolerance

Classification and Diagnosis of Diabetes: *Standards of Medical Care in Diabetes - 2022. Diabetes Care* 2022;45(Suppl. 1):S17-S38

Type 1 Diabetes Screening

Type 1 Diabetes Screening:

- ❑ Currently recommended in setting of research study or considered an option for 1st-degree family members of proband with type 1 diabetes

  - Autoantibodies to insulin
  - Glutamic acid decarboxylase (GAD)
  - Islet antigen 2
  - Zinc transporter 8

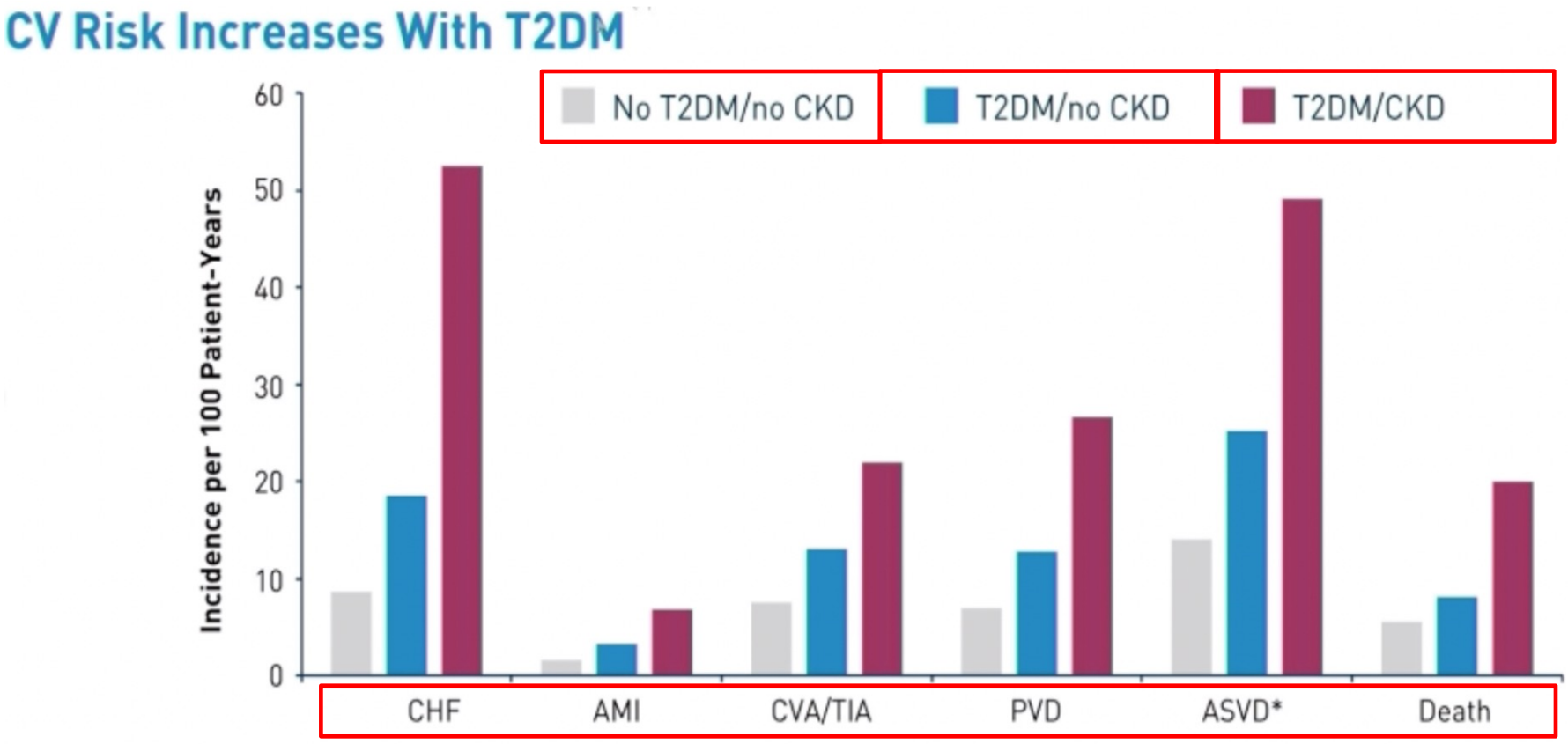
Classification and Diagnosis of Diabetes: *Standards of Medical Care in Diabetes - 2022*. *Diabetes Care* 2022;45(Suppl. 1):S17-S38

CVD & Diabetes

- CVD is the primary cause of death in people with diabetes.[1]
- People with diabetes have a 2- to 4-fold increased risk of developing CVD compared with general population.[2]
- Fewer than 1 in 5 adults with Type 2 diabetes are successfully managing their heart disease risk.[3]

[1]Sarwar N, Gao P, et al. Emerging Risk Factors Collaboration: Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: a collaborative meta-analysis of 102 prospective studies. Lancet. 2010;375(9733):2215-2222. doi:10.1016/S0140-6736(10)60484-9
[2]Tancredi M, Rosengren A, Svensson AM, et al. Excess mortality among persons with type 2 diabetes. N Engl J Med. 2015;373(18):1720-1732.
[3]Joseph JJ et al. Comprehensive Management of Cardiovascular Risk Factors for Adults With Type 2 Diabetes: A Scientific Statement From the American Heart Association. Circulation. 2022;144:00–00. DOI: 10.1161/CIR.0000000000001040

T2DM & Associated Risks of CVD, CKD & Death



Foley RN, Murray AM, Li S, et al. Chronic kidney disease and the risk for CV disease, renal replacement, and death in the United States Medicare population, 1998 to 1999. *J Am Soc Nephrol*. 2005;16(2):489-495.

Diabetes & Co-morbidities – What's the mechanism?

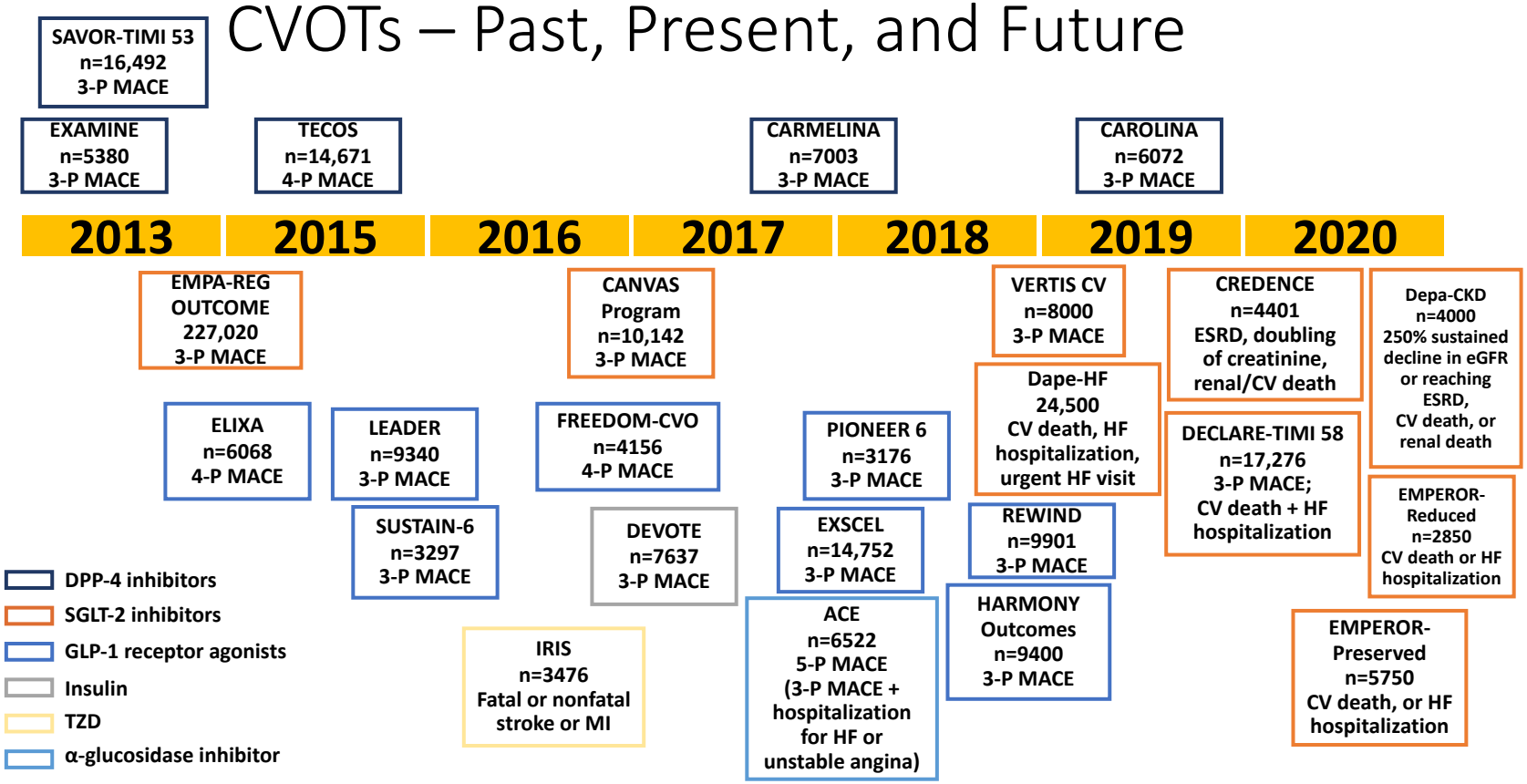
- Pathophysiologic mechanism underlying the association between CVD, HF, DKD & diabetes is hypothesized to be vascular damage caused by uncontrolled hyperglycemia.

- Damage is thought to be diverse, widespread & complex.

Buse JB, Ginsberg HN, Bakris GL, et al. Primary prevention of cardiovascular diseases in people with diabetes mellitus: a scientific statement from the American Heart Association and the American Diabetes Association. Diabetes Care. 2007;30(1):162-172. doi:10.2337/dc07-9917

Cardiovascular Outcomes Trials (CVOTs)

CVOTs – Past, Present, and Future



Cardiovascular Outcomes Trials

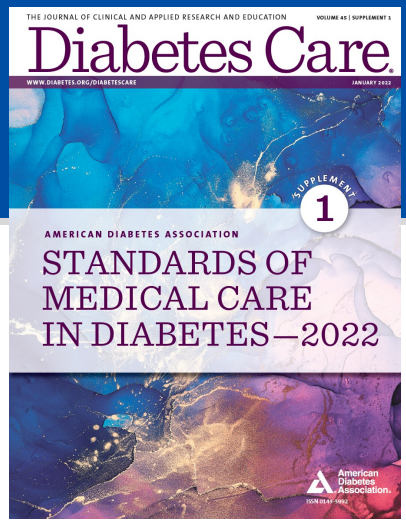
Major Drug Classes Studied

DPP-4 Inhibitors	GLP-1 Receptor Agonists	SGLT2 Inhibitors
• Alogliptin • Linagliptin • Saxagliptin • Sitagliptin	• Albiglutide • Dulaglutide • Exenatide • Lixisenatide • Liraglutide • Semaglutide	• Canagliflozin • Dapagliflozin • Empagliflozin • Ertugliflozin

- **DPP-4 inhibitors:** Increase incretin levels, reducing release of glucagon & increasing insulin secretion
- **GLP-1 receptor agonists:** Stimulate glucose-dependent insulin release & inhibit glucagon secretion
- **SGLT2 inhibitors:** Interfere with glucose reabsorption & prevent renal reuptake of glucose from the glomerular filtrate

- Since FDA issued guidance >25 CVOTs have launched
- Primary endpoint: major adverse cardiac events (MACE)
  - 3-point MACE = cardiovascular death, nonfatal myocardial infarction, nonfatal stroke
  - 4-point MACE = 3-point MACE + additional CV endpoint (acute coronary syndrome or hospitalization for heart failure or unstable angina)

Proactive Management of Type 2 Diabetes



Diagnosis

Lifestyle modification & Diabetes Self-Management Education & Support (DSMES)

Glucose Control

Improve glycemic control to reduce symptoms & microvascular risk

Cardiovascular Risk

Reduce macrovascular risk especially by controlling lipids & blood pressure

Comorbidities

Manage co-morbidities (obesity, CVD, CKD, depression, fatty liver, eye & neuropathic disease)

Comprehensive Goals Of Diabetes Management

- **Set glycemic targets to reduce microvascular & macrovascular CVD events**
  - A1C targets
  - Ambulatory Glucose Profile targets
    - BGM - Fasting & postprandial glycemia goals
    - CGM – "Time in Range" & glucose variability goals
- **Consider behavioral & drug therapies in view of pathogenesis**
  - Lifestyle Interventions
  - Pharmacologic interventions aimed at:
    - Minimizing hypoglycemia
    - Controlling glycemic variability to maximize "Time in Range"
- **Consider therapies for prevention or management of comorbidities**
  - CVD, HTN, CHF – aspirin, anti-platelet, antihypertensive agents
  - DKD – RAAS agents
  - Dyslipidemia – statins, ezetimibe, fibrates, fenofibrates, Icosapent ethyl, PCSK9 inhibitors

SMBG = Self-Monitoring of Blood Glucose
CGM = Continuous Glucose Monitoring
RAAS = Renin-Angiotensin-Aldosterone System

Prevention or Delay of Type 2 Diabetes andAssociated Comorbidities: *Standards of Medical Care in Diabetes - 2022. Diabetes Care* 2022;45(Suppl. 1):S39-S45

Goals of Management Beyond Glucose Control

	AACE[1]	ADA[2]
A1C %	≤6.5	≤7.0
Fasting/pre-meal BG, mg/dL	<110	80-130
Postprandial, mg/dL	<140[a]	<180[b]
Blood pressure, mm Hg	< 130/80	<140/90
LDL-C, mg/dL	<100 (<70) (<55)[c]	Based on risk

[a]2-hr postmeal
[b]Peak
[c]Lower goals recommended for high-risk/CVD

1. Garber AJ, et al. *Endocr Pract*. 2018;24(1):91-120;
2. ADA. *Diabetes Care* 2022; 45(Supplement 1):S84-S96.

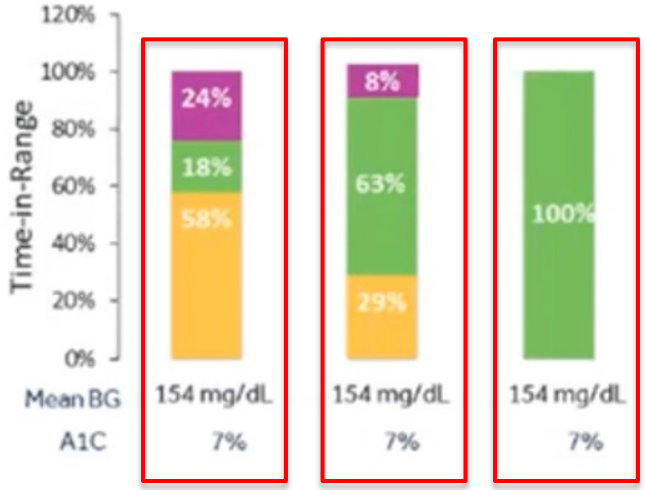
BG = Blood Glucose
AACE = American Association of Clinical Endocrinologists
ADA = American Diabetes Association

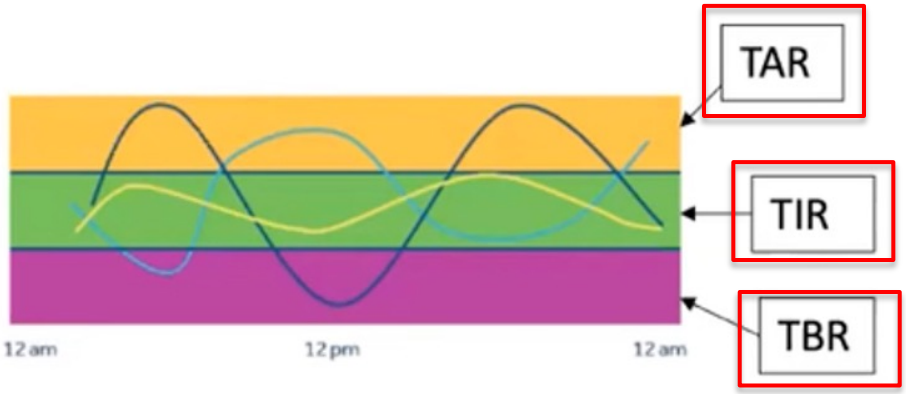
Standards of Care for Glycemic Management

ADA. Glycemic Targets. *Diabetes Care.* 2022;45(Suppl.1):S83-S96

Limitations of Hemoglobin A1c

- Unable to reflect acute glycemic excursions
- A1c may be inaccurate in a range of physiologic and pathologic conditions
- Does not provide time-specific blood glucose data

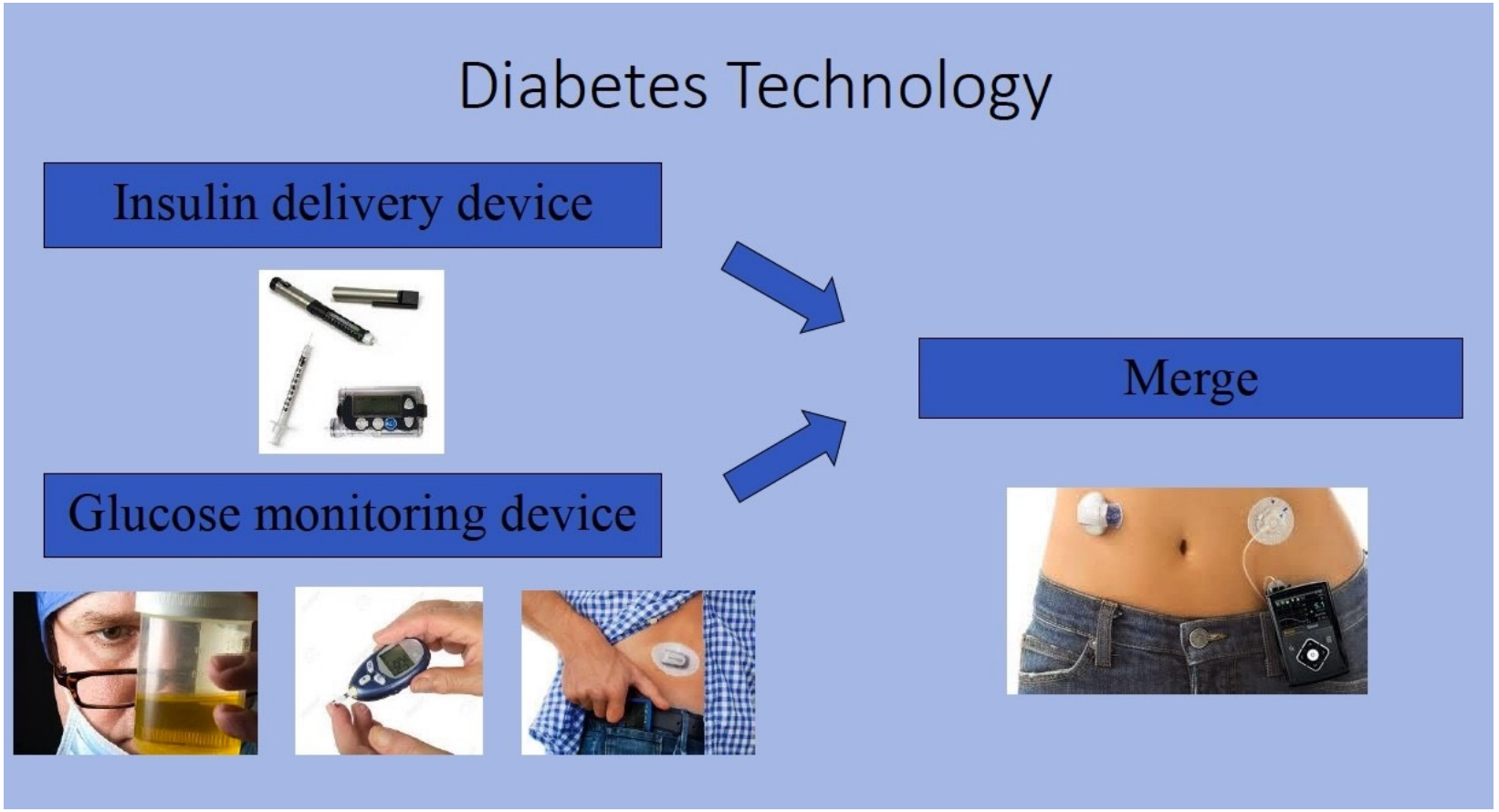




Approach to the Patient

- Engage & Explore
- Screen & Monitor
- **Use Technology**
- Customize
- Support & Follow

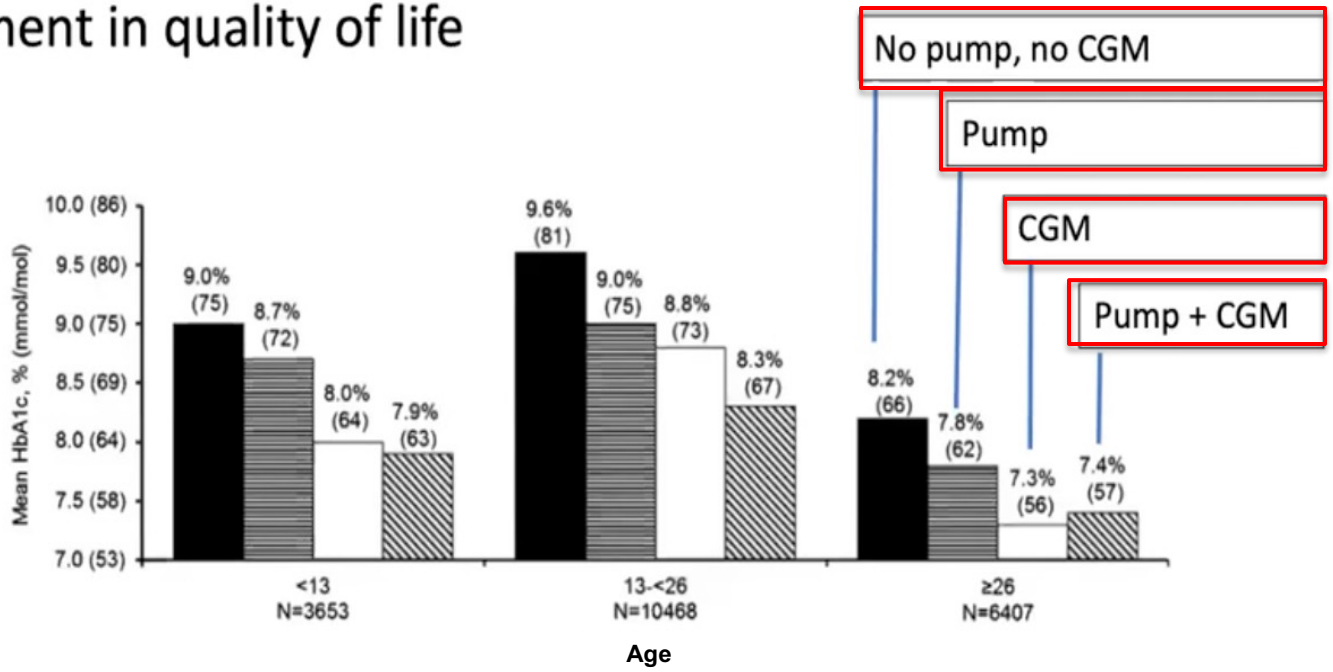
Advancing Diabetes Technology



Dovc K, Battelino T. Evolution of Diabetes Technology. *Endocrinol Metab Clin North Am*. 2020;49(1):1-18. doi:10.1016/j.ecl.2019.10.009

Why Use Technology?

- Improved glycemic control
- Reduction in hypoglycemia
- More information on daily fluctuations
- Potential improvement in quality of life



Foster et al. Diabetes Tech. Ther. 2019, DOI: 10.1089/dia.2018.0384

Types of CGMs

Type of CGM	Description
rtCGM	Measures & stores BG levels continuously w/o prompting; patient-owned
isCGM with & w/o alerts	Measures BG levels continuously but requires scanning for data storage; patient-owned
Professional CGM	Placed by provider & worn for discrete time (7-14 days); patient may be blinded or visible to data while wearing; data used to assess patterns/trends; CGM clinic-owned

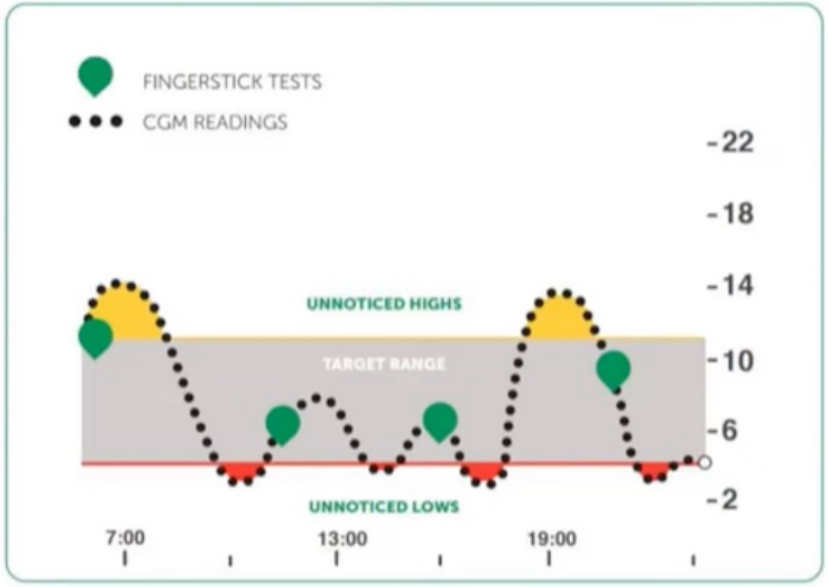
CGM: continuous glucose monitor
rtCGM: real-time CGM
isCGM: intermittently scanned CGM

Diabetes Technology: *Standards of Medical Care in Diabetes - 2022. Diabetes Care* 2022;45(Suppl. 1):S97-S112.

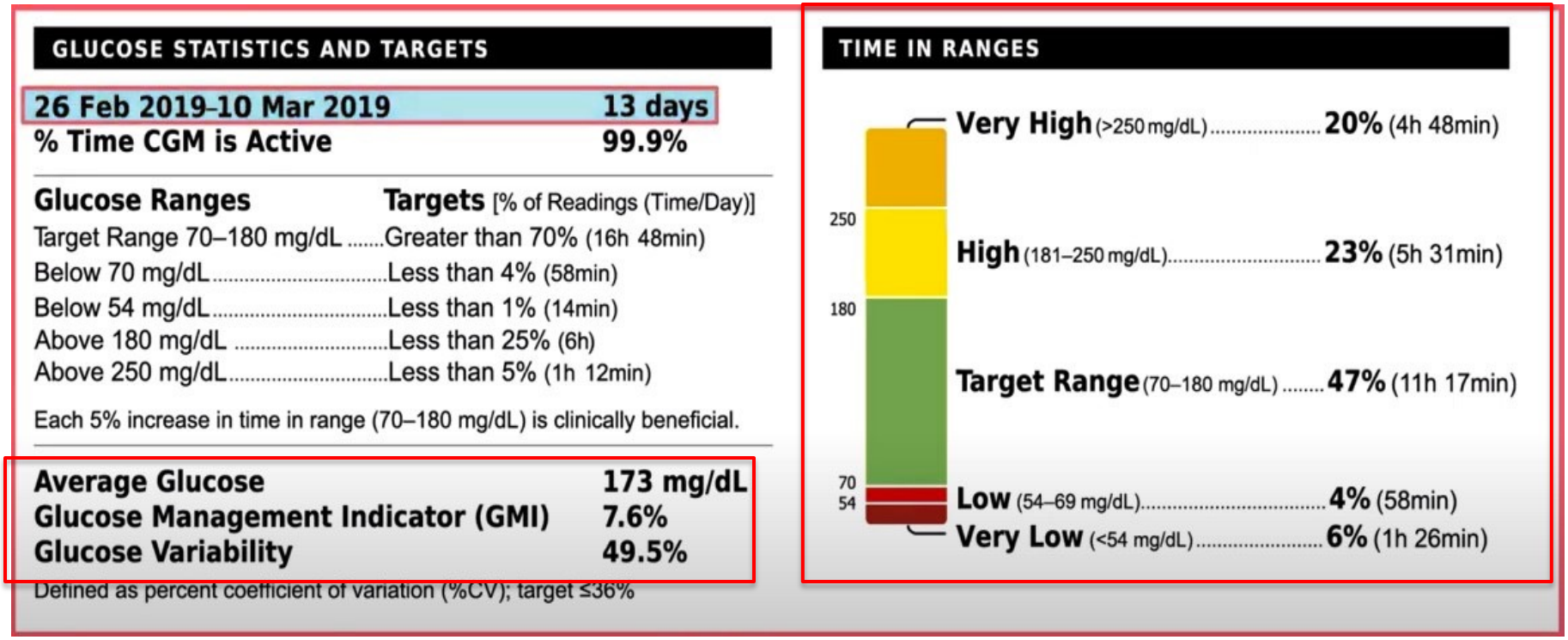
Continuous Glucose Monitoring

- Subcutaneous glucose sensor→ transmitter→ display
- Measures glucose levels every 5 minutes
- PROFESSIONAL DEVICES
  - Owned by clinic
  - Retrospective or Real-Time

- PERSONAL DEVICES:
  - Intermittently scanned or real-time



CGM Report Dashboard



GLUCOSE STATISTICS AND TARGETS

26 Feb 2019–10 Mar 2019	**13 days**
% Time CGM is Active	**99.9%**

Glucose Ranges	**Targets** [% of Readings (Time/Day)]
Target Range 70–180 mg/dL	Greater than 70% (16h 48min)
Below 70 mg/dL	Less than 4% (58min)
Below 54 mg/dL	Less than 1% (14min)
Above 180 mg/dL	Less than 25% (6h)
Above 250 mg/dL	Less than 5% (1h 12min)

Each 5% increase in time in range (70–180 mg/dL) is clinically beneficial.

Average Glucose	**173 mg/dL**
Glucose Management Indicator (GMI)	**7.6%**
Glucose Variability	**49.5%**

Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES

250
180
70
54

Very High (>250 mg/dL) **20%** (4h 48min)

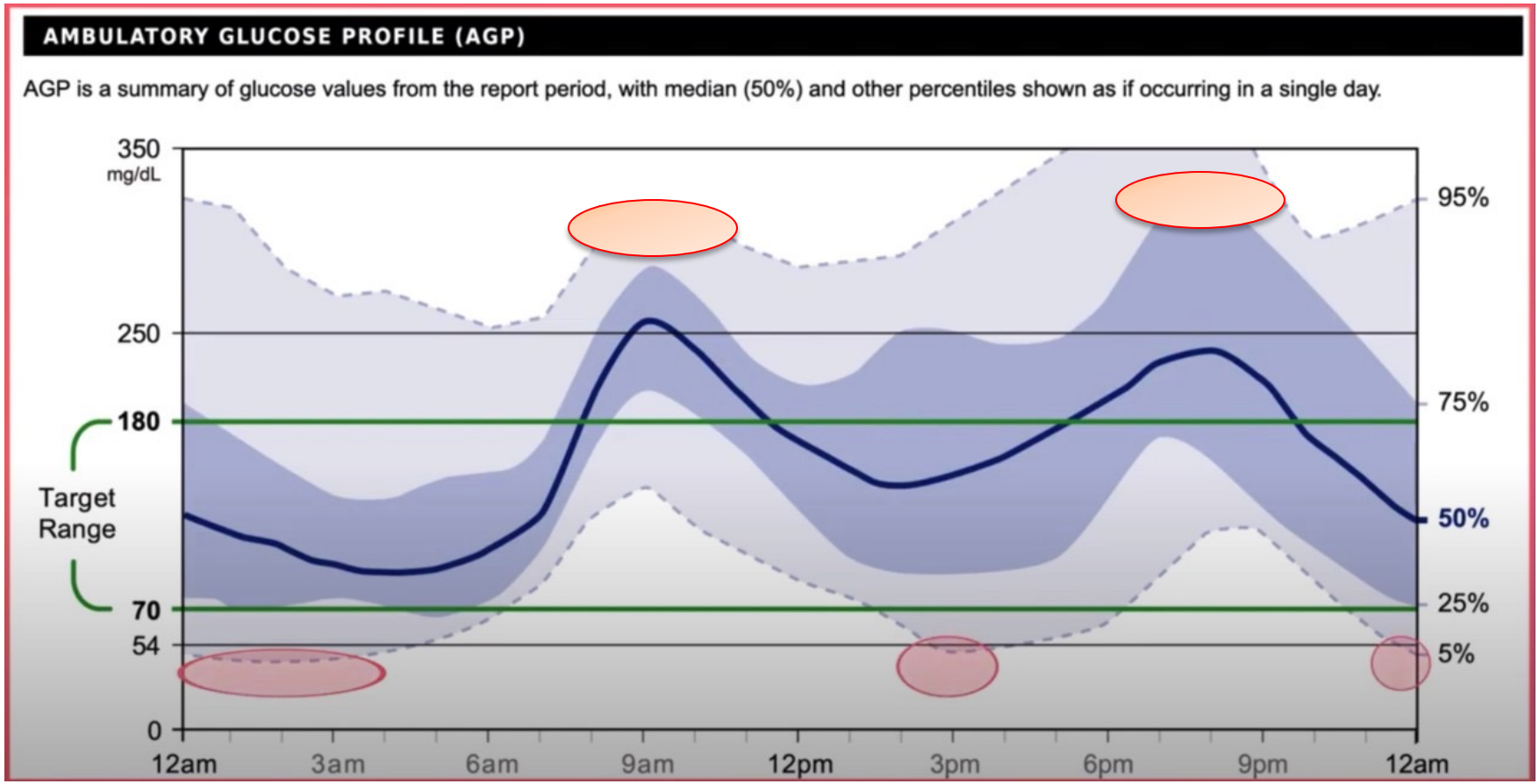
High (181–250 mg/dL) **23%** (5h 31min)

Target Range (70–180 mg/dL) **47%** (11h 17min)

Low (54–69 mg/dL) **4%** (58min)

Very Low (<54 mg/dL) **6%** (1h 26min)

Ambulatory Glucose Profiles (AGPs)



Glycemic Targets for Patients with Diabetes[1,2]

Patient Characteristics	Reasonable HbA_{1c} Goal, %	Recommended Blood Glucose % for TIR or TBR
Nonpregnant adults aged <65 years with type 1 or 2 diabetes	<7.0	>70% of TIR 70-180 mg/dL <4% of TBR ≤69 mg/dL
Healthy adults aged ≥65 years with diabetes and few coexisting chronic illnesses	7.0-7.5	Fasting preprandial goal: 80-130 mg/dL Peak postprandial: <180 mg/dL
Adults aged ≥65 years with diabetes and multiple coexisting chronic illnesses	<8.0	>50% of TIR 70-180 mg/dL <1% of TBR ≤69 mg/dL

TBR, time below range; **TIR**, time in range

[1]ADA.Glycemic Targets. *Diabetes Care.* 2022;45(Suppl.1):S83-S96.
[2]Battelino T, Danne T, Bergenstal RM, et al. Clinical targets for continuous glucose monitoring data interpretation: recommendations from the International Consensus on Time in Range. *Diabetes Care*. 2019;42(8):1593-1603. doi:10.2337/dci19-0028

CGM Use Prevalence & Access Challenges[1,2]

- CGM use is estimated **15% of** people with T1DM in the US
- Access is improving with new 2021 Medicare coverage rules
- Access challenges remain:
  - Access/Rising Costs
  - Patient education
  - Therapeutic inertia
  - Variation in provider practices

[1]Cefalu WT, Kaul S, Gerstein HC, et al. Cardiovascular Outcomes Trials in Type 2 Diabetes: Where Do We Go From Here? Reflections From a *Diabetes Care* Editors' Expert Forum. *Diabetes Care*. 2018;41(1):14-31.
[2]Gerard SO, Ritchie J. Challenges of Inpatient Glycemic Control. *J Nurs Care Qual*. 2017;32(3):267-271.

A Good Word & News on Medicare Coverage…

New Medicare Coverage Make CGMs More Accessible

- July 18, 2021: Medicare permanently eliminated requirement of 4x/day fingerstick in order to qualify for CGM coverage
- If looking for a CGM for Medicare patients, there is now a simplified, fingerstick-free approval process for coverage.
- Out-of-pocket costs for CGM will depend on a few factors, like what Medicare benefit plans looks like & where device is secured.
- Check for Diabetes DME distributers in your area or call 1-800-MEDICARE) to determine cost.

Blood Glucose Meter Use | Serum vs ISF glucose

- An estimated **70%** of patients using diabetes medication purchased SMBG strips[1]
- BG measures serum glucose (SG) & CGMs read interstitial fluid (ISF) glucose
- Serum glucose readings gives most accurate reading & is 5-10 min ahead of ISF glucose
- When SG levels decrease, sensor readings in ISF **may be higher** than the serum glucose reading (& vice versa)

[1]Kjome RL, Granas AG, Nerhus K, Roraas TH, Sandberg S. The prevalence of self-monitoring of blood glucose and costs of glucometer strips in a nationwide cohort. *Diabetes Technol Ther*. 2010;12(9):701-705.

Approach to Patient with BG meter

- **Always bring your BG meter to clinic!**
- **Invite them to show you their BG meter review of data**
- **Data review usually commences following initial power up**
  - 7 – 14 – 30 – 90-day averages
  - Percent TBR, TIR, & TAR
  - Pre-meal average histograms
- **Encourage patient use of data review options**

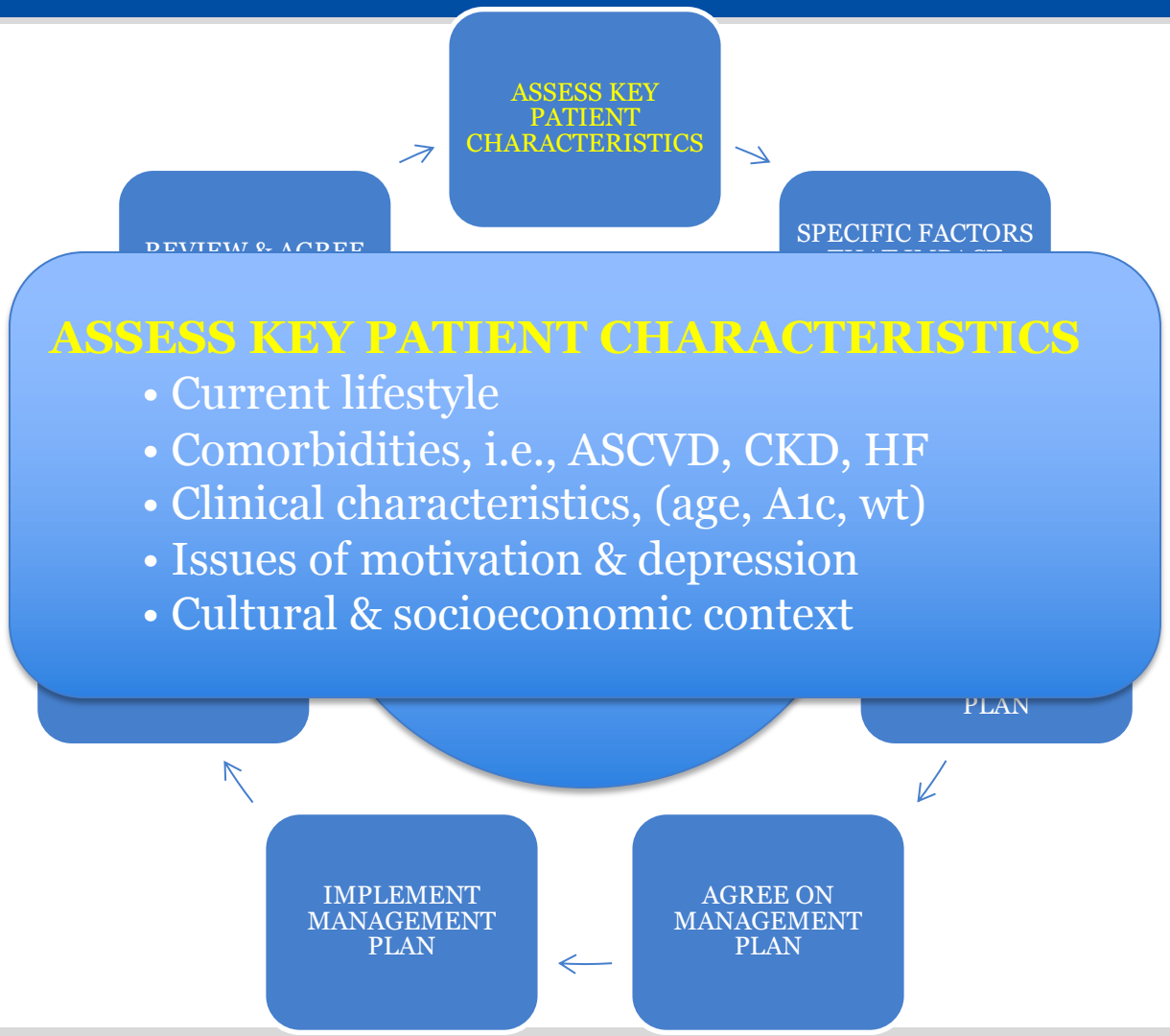
Approach to the Patient

- Engage & Explore
- Screen & Monitor
- Use Technology
- **Customize**
- Support & Follow

ADA/EASD Management Decision Cycle[1,2]

[1]Decision cycle for patient-centered glycemic management in type 2 diabetes. HbA_{1c}, glycated hemoglobin.
[2]Adapted from Davies MJ, D'Alessio DA, Fradkin J, et al. Diabetes Care 2018;41:2669–2701.
Clin Diabetes. 2022;40(1):10-38. doi:10.2337/cd22-as01

ADA/EASD Management Decision Cycle[1,2]



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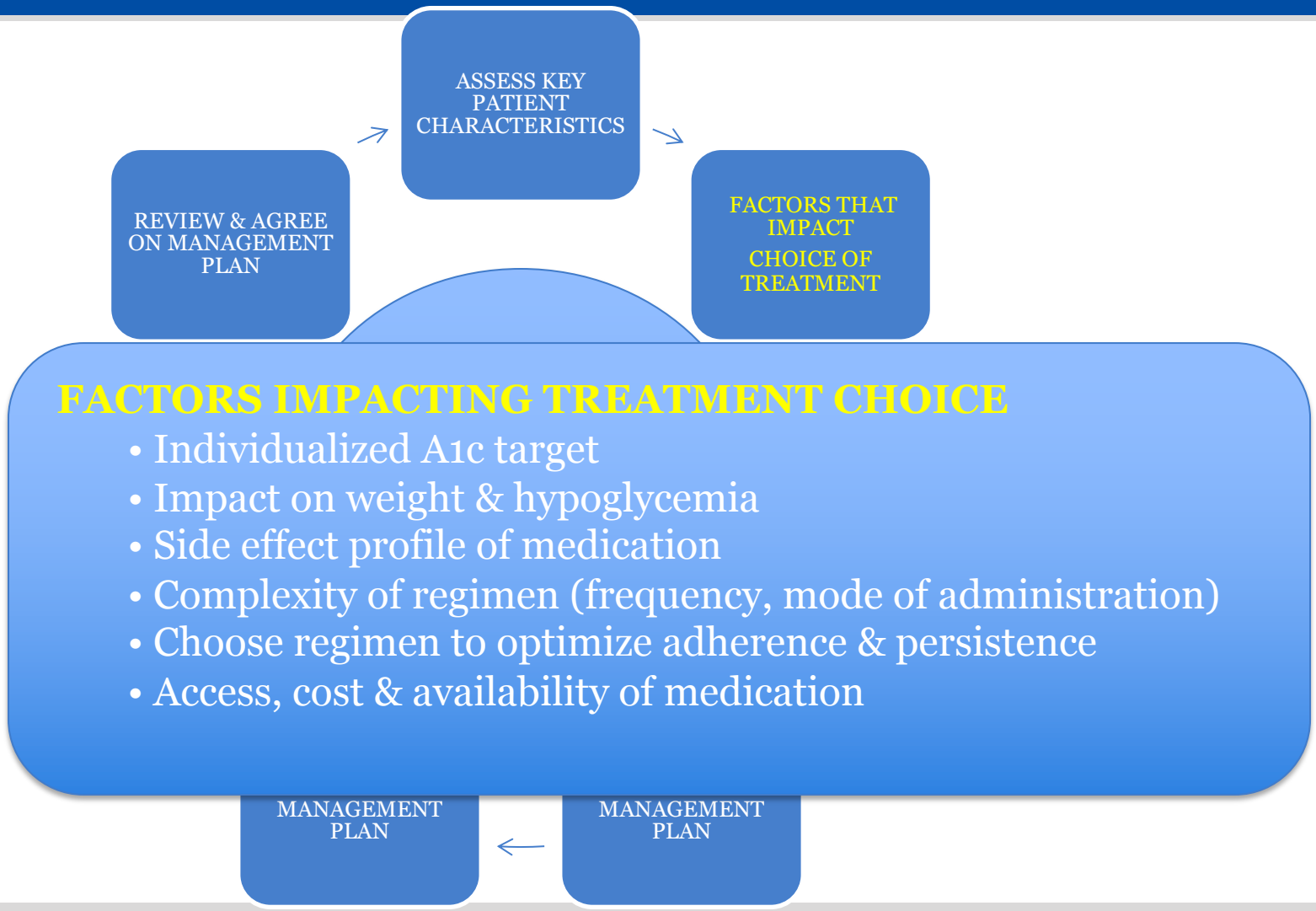

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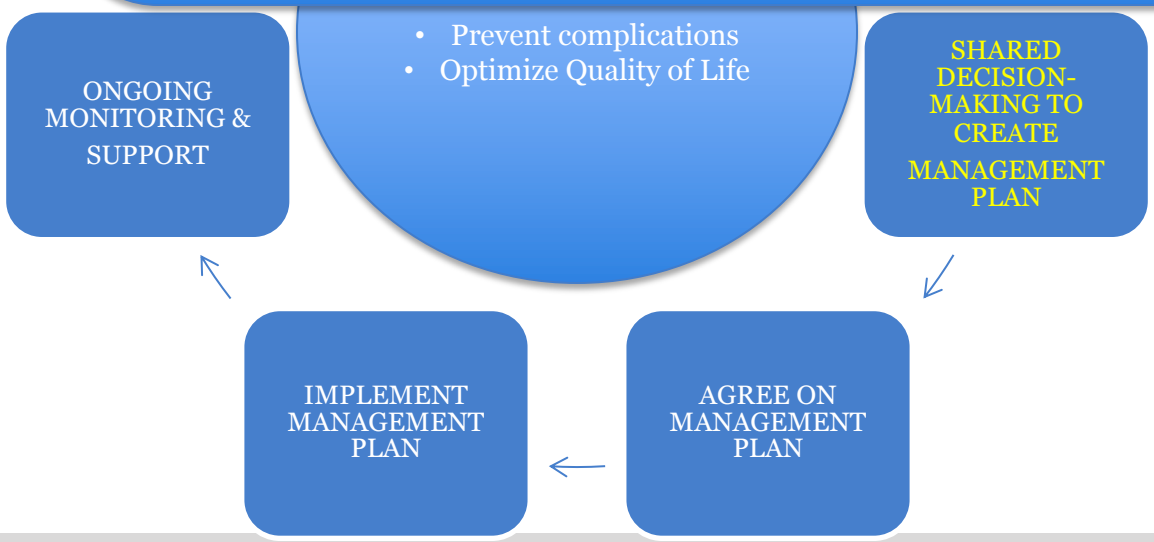
ADA/EASD Management Decision Cycle[1,2]

SHARED DECISION-MAKING TO CREATE A PLAN

- Involves an educated & informed patient (+family/caregiver)
- Seeks patient preferences
- Effective consultation
  - Motivational interviewing
  - Goal setting
  - Shared decision-making
- Empowers the patient
- Ensures access to DSMES



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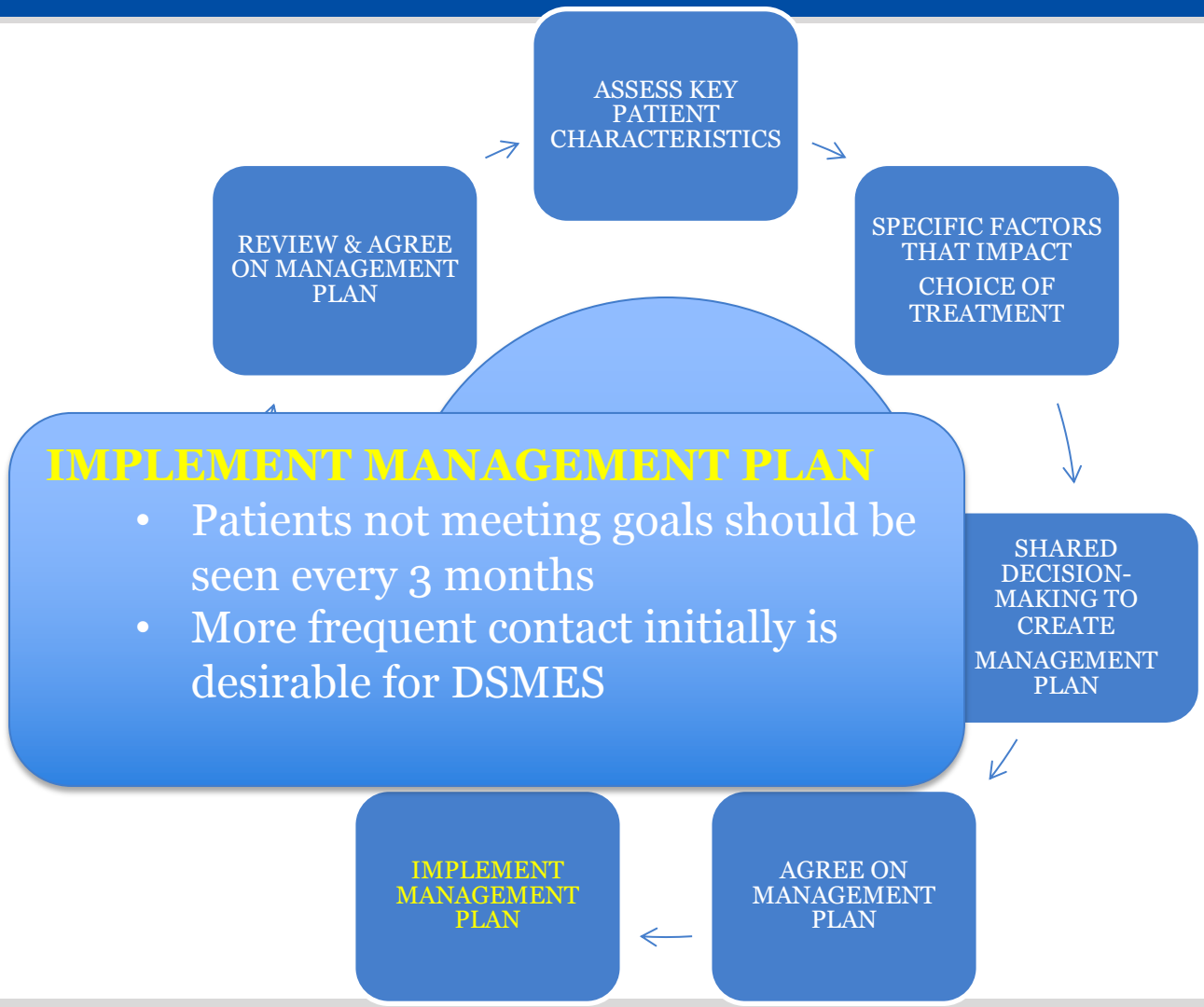

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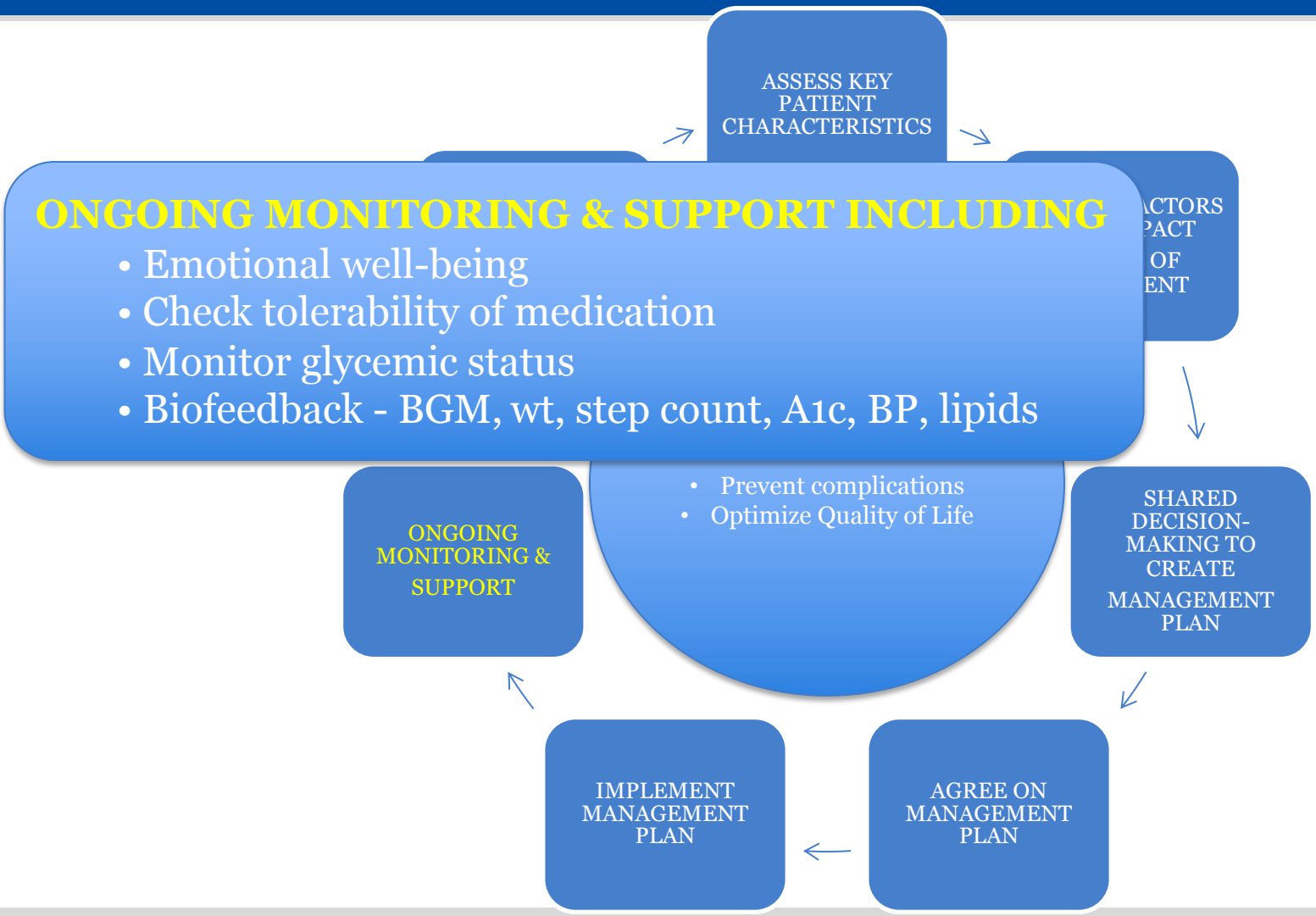

Yale SCHOOL OF MEDICINE
Physician Associate Program

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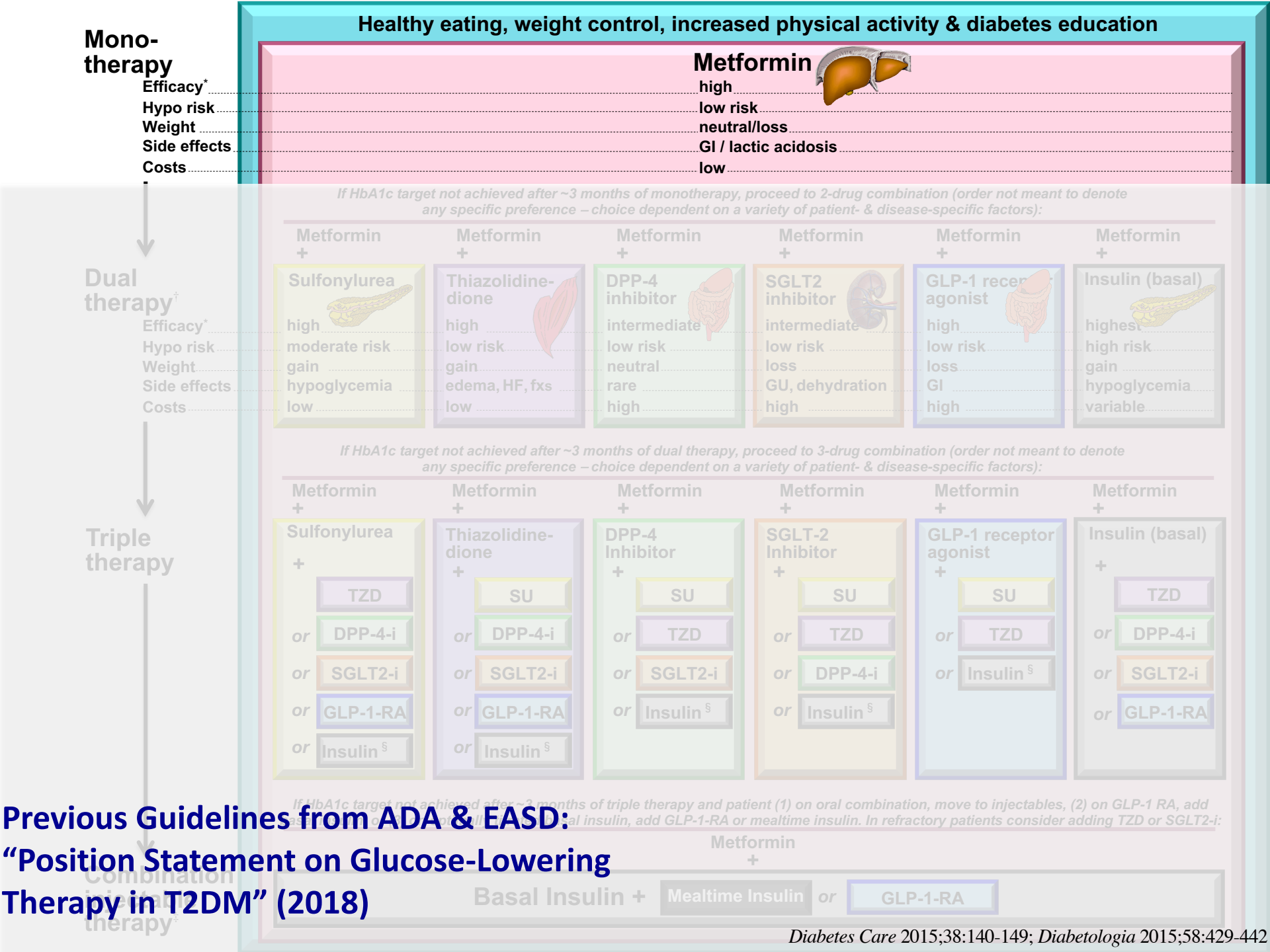
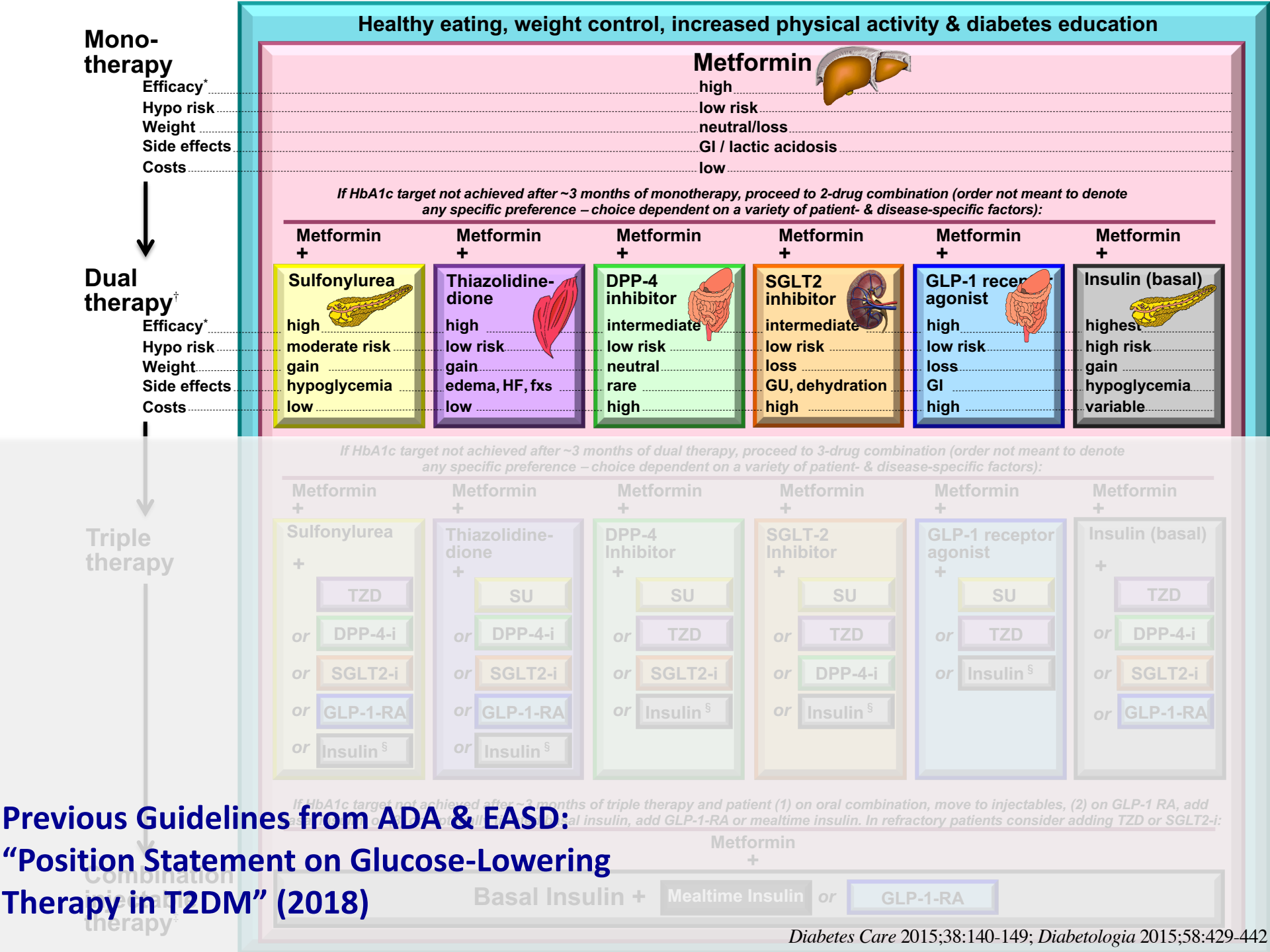


Previous Guidelines from ADA & EASD: "Position Statement on Glucose-Lowering Therapy in T2DM" (2018)

Diabetes Care 2015;38:140-149; *Diabetologia* 2015;58:429-442



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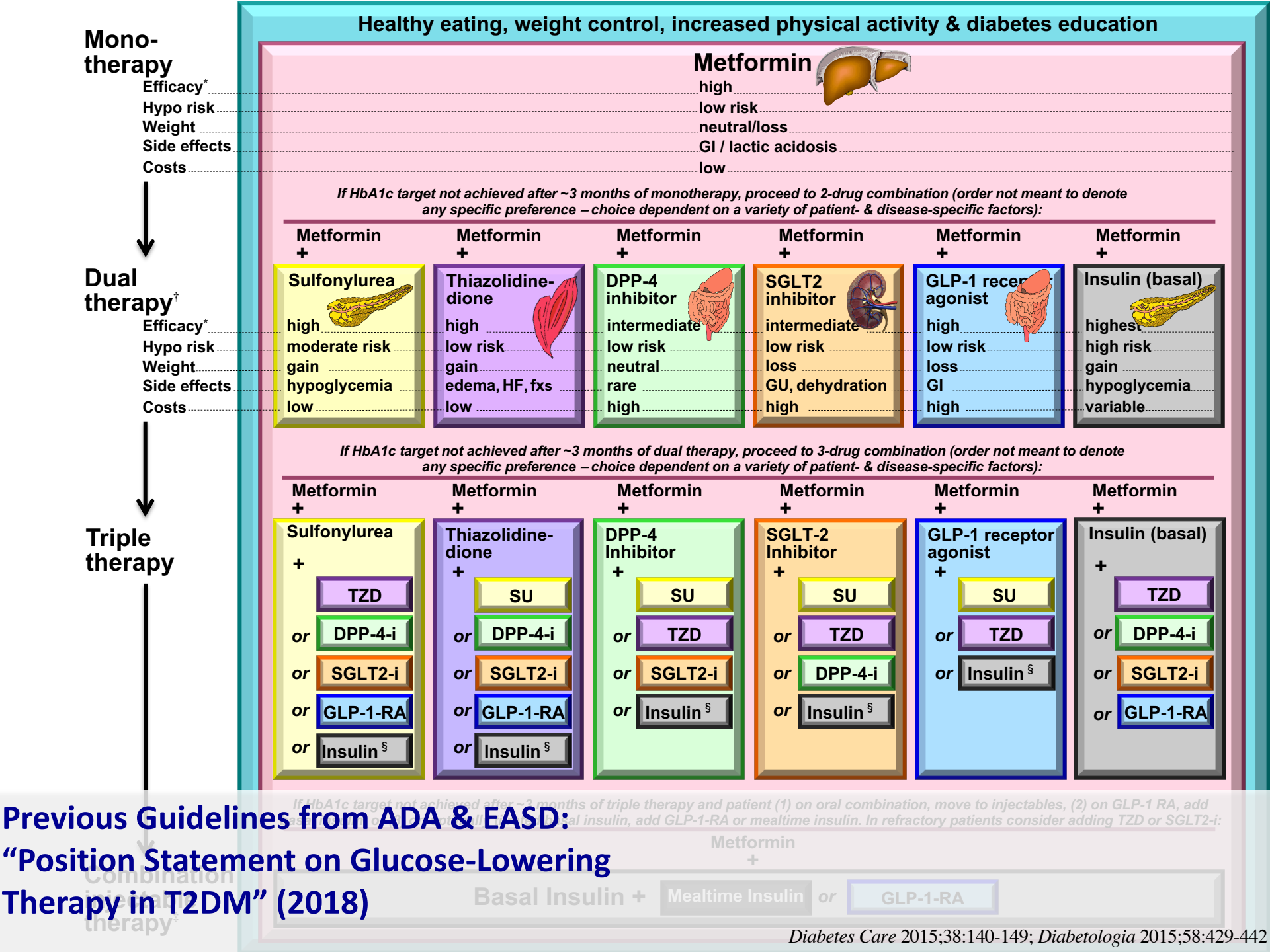

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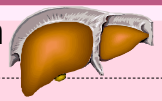
Healthy eating, weight control, increased physical activity & diabetes education

Mono-therapy

Metformin



Efficacy*	high
Hypo risk	low risk
Weight	neutral/loss
Side effects	GI / lactic acidosis
Costs	low

If HbA1c target not achieved after ~3 months of monotherapy, proceed to 2-drug combination (order not meant to denote any specific preference – choice dependent on a variety of patient- & disease-specific factors):

Dual therapy†

Metformin +	Sulfonylurea	Thiazolidine-dione	DPP-4 inhibitor	SGLT2 inhibitor	GLP-1 receptor agonist	Insulin (basal)
Efficacy*	high	high	intermediate	intermediate	high	highest
Hypo risk	moderate risk	low risk	low risk	low risk	low risk	high risk
Weight	gain	gain	neutral	loss	loss	gain
Side effects	hypoglycemia	edema, HF, fxs	rare	GU, dehydration	GI	hypoglycemia
Costs	low	low	high	high	high	variable

If HbA1c target not achieved after ~3 months of dual therapy, proceed to 3-drug combination (order not meant to denote any specific preference – choice dependent on a variety of patient- & disease-specific factors):

Triple therapy

Metformin +	Sulfonylurea +	Thiazolidine-dione +	DPP-4 Inhibitor +	SGLT-2 Inhibitor +	GLP-1 receptor agonist +	Insulin (basal) +
	TZD	SU	SU	SU	SU	TZD
or	DPP-4-i	DPP-4-i	TZD	TZD	TZD	DPP-4-i
or	SGLT2-i	SGLT2-i	SGLT2-i	DPP-4-i	Insulin §	SGLT2-i
or	GLP-1-RA	GLP-1-RA	Insulin §	Insulin §		GLP-1-RA
or	Insulin §	Insulin §				

If HbA1c target not achieved after ~3 months of triple therapy and patient (1) on oral combination, move to injectables, (2) on GLP-1 RA, add basal insulin, or (3) on optimally titrated basal insulin, add GLP-1-RA or mealtime insulin. In refractory patients consider adding TZD or SGLT2-i:

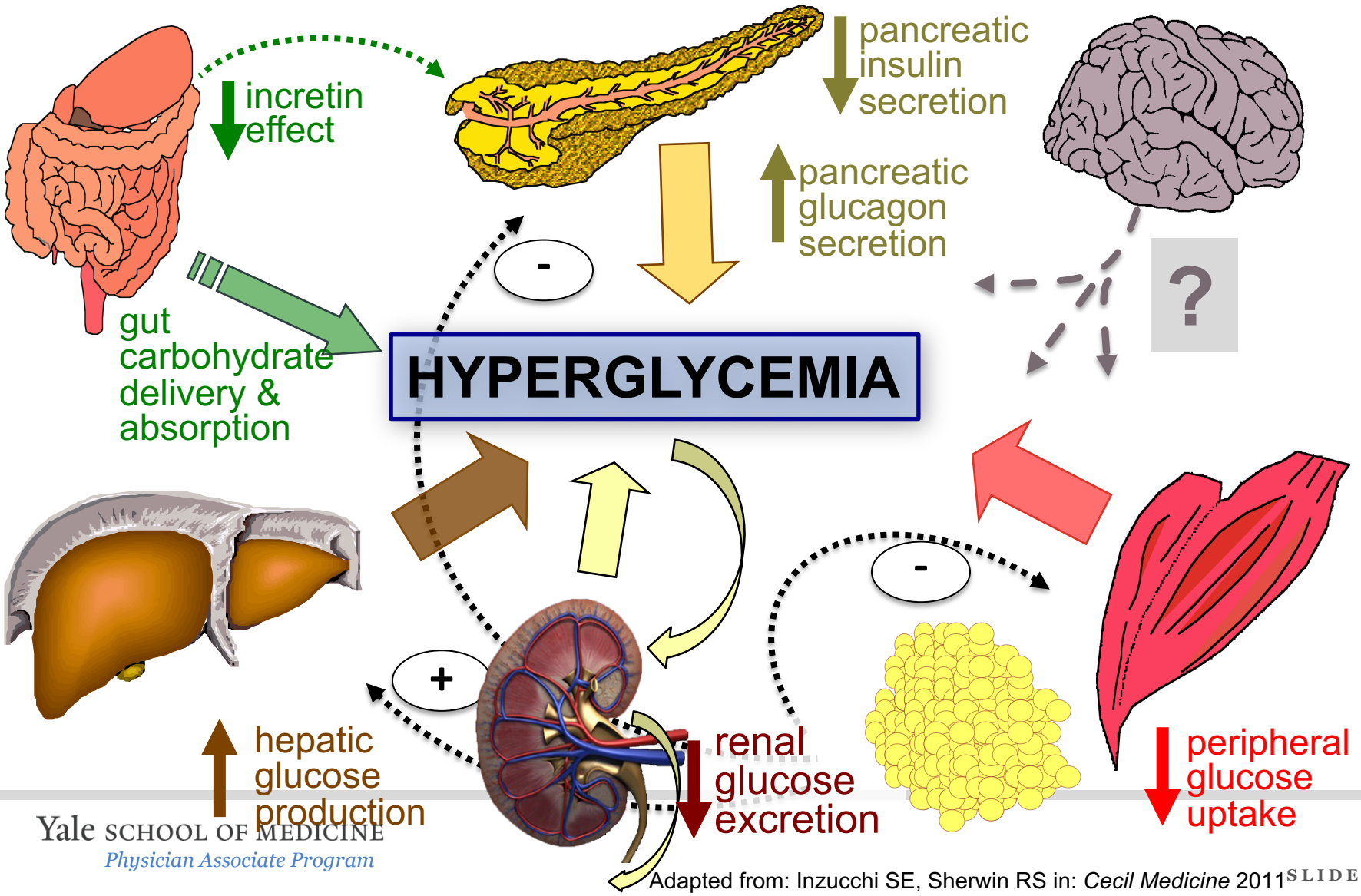
Combination injectable therapy‡

Metformin +

Basal Insulin + Mealtime Insulin *or* GLP-1-RA

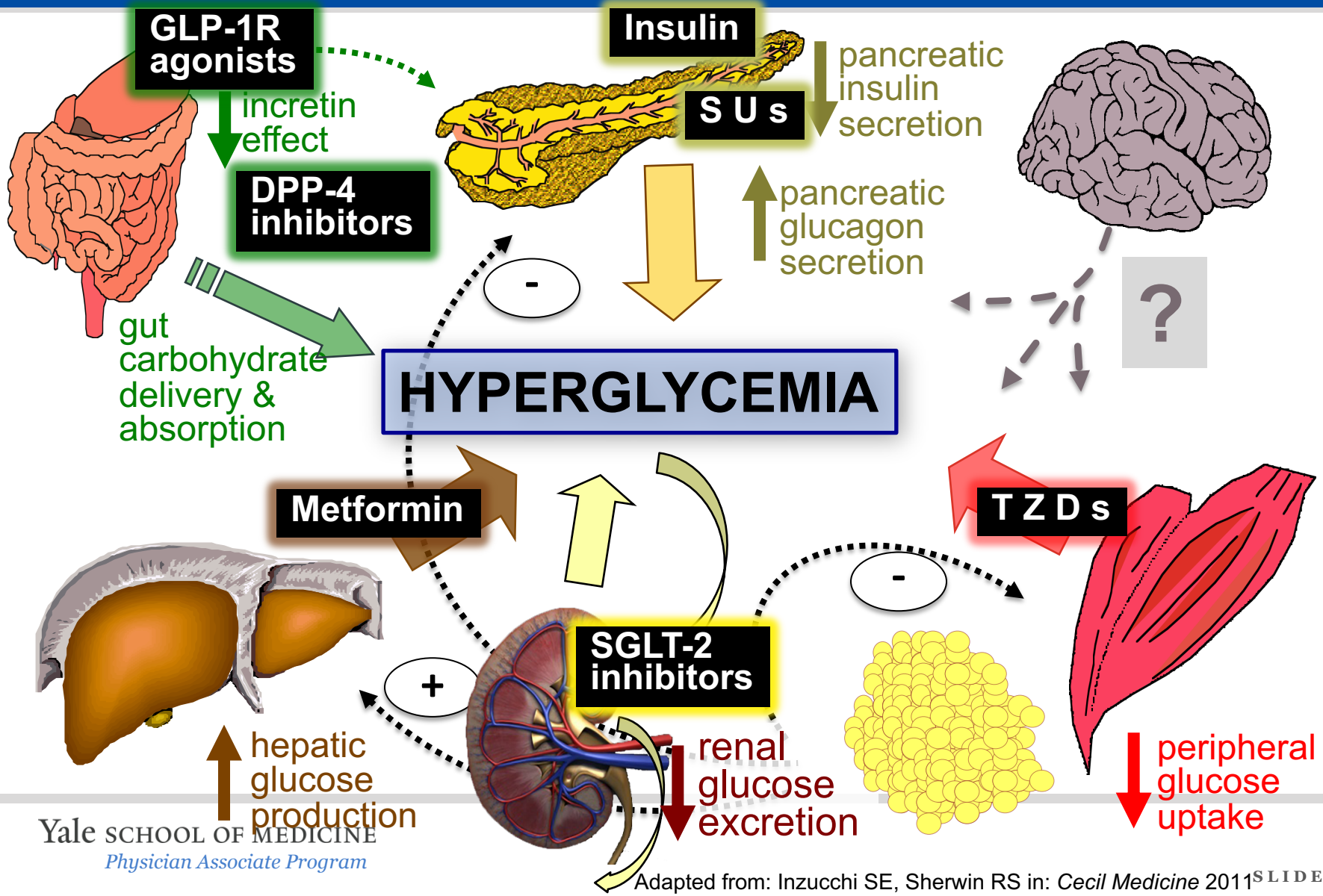
Diabetes Care 2015;38:140-149; *Diabetologia* 2015;58:429-442

Multiple Complex Pathophysiological Abnormalities in T2DM



Adapted from: Inzucchi SE, Sherwin RS in: *Cecil Medicine* 2011

Major Pathophysiologically-Based Therapies for T2DM



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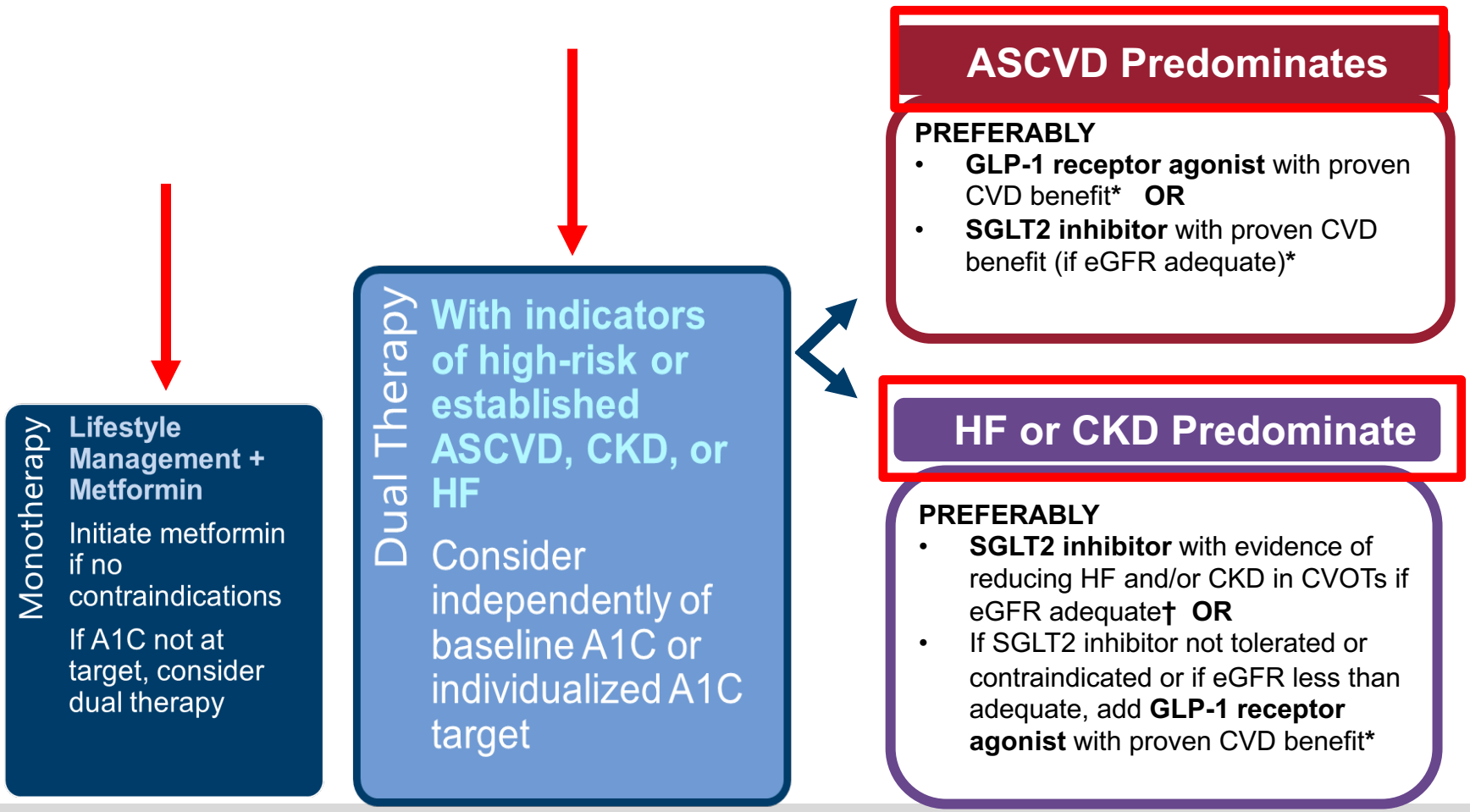
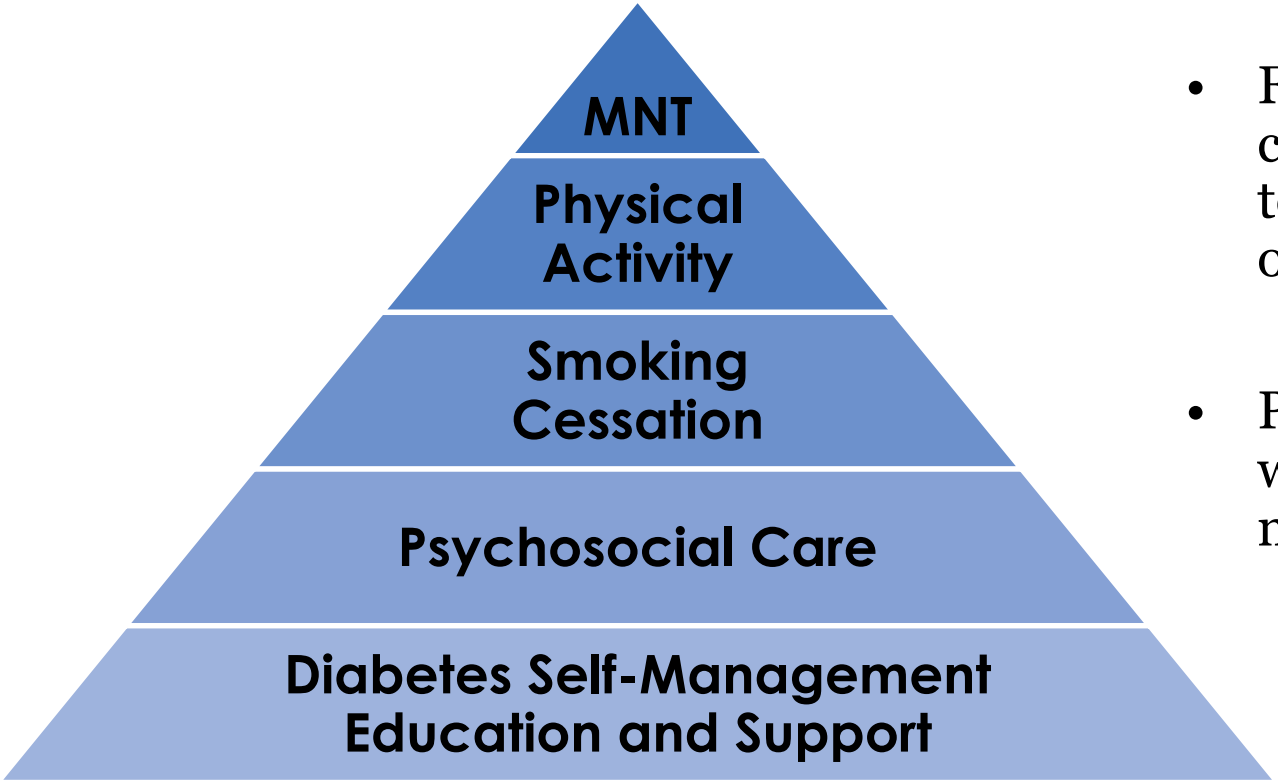
Roles of GLP-1 RAs & SGLT-2 in CVD Risk Reduction for Patients with Type 2 Diabetes



ADA. Diabetes Care. 2022;45:S125-S143.

Lifestyle Modification & Patient Education

Healthy eating, weight control, increased physical activity & diabetes education



- Facilitating behavior change & well-being to improve health outcomes
- Patient-centered care with individualized management plan

ADA. Diabetes Care. 2022;45:S39-S59
ADA. Diabetes Care. 2022;45:S60-S82.
Evert AB, et al. Diabetes Care. 2019;42:731-54.
Powers MA, et al. Diabetes Care. 2015;38:1372-82.

Lifestyle Medicine – *"The Secret Sauce"*

Evidence-based practice of assisting individuals & families adopt & sustain behaviors that can improve health & quality of life.

Lianov L, Johnson M. Physician competencies for prescribing lifestyle medicine. JAMA. 2010;304(2):202-203. doi:10.1001/jama.2010.903

Lifestyle Medicine: Evidence & Quandary

- Significant associations exist between lifestyle variables & incidence-rate reductions in concurrent diabetes, CVD & HF
- Yet, only 3% of US adults live a healthy lifestyle as defined by the pillars of activity diet, sleep, substance use, relationships, and stress management.[1,2]
- Clinicians cite major barriers to counseling patients effectively on lifestyle medicine including lack of confidence, knowledge & skill.[3]

[1]Loprinzi PD, Branscum A, Hanks J, Smit E. Healthy lifestyle characteristics and their joint association with cardiovascular disease biomarkers in US adults. Mayo Clin Proc. 2016;91(4):432-442. doi:10.1016/j.mayocp.2016.01.009
[2]American College of Lifestyle Medicine. Accessed May 21, 2021. https://lifestylemedicine.org/What-is-Lifestyle-Medicine.
[3]Lianov L, Johnson M. Physician competencies for prescribing lifestyle medicine. JAMA. 2010;304(2):202-203. doi:10.1001/jama.2010.903

Clinician & Patient Collaboration

Lifestyle

- Collaborate on a realistic activity plan
- Identify simple changes in diet/meal plan for weight loss & healthier eating habits
- Reduce alcohol consumption
- Encourage appropriate sleep hygiene
- Select technology (s) most appropriate for evaluating behavior change
  - BGM
  - CGM
  - Apps
  - Online portals

Behavioral

- Avoid use of fear or intimidation tactics
- Provide encouragement & kudos!
- Evaluate patient goals/health outcomes for their diabetes treatment
  - "What do you want?"
- Identify biggest challenges/barriers & fears
  - Knowledge deficits, costs, stress, family issues, psychologic obstacles, social support, competing priorities,
- Develop strategy for dealing with challenges & potential set-backs
- Consider DSMES referral

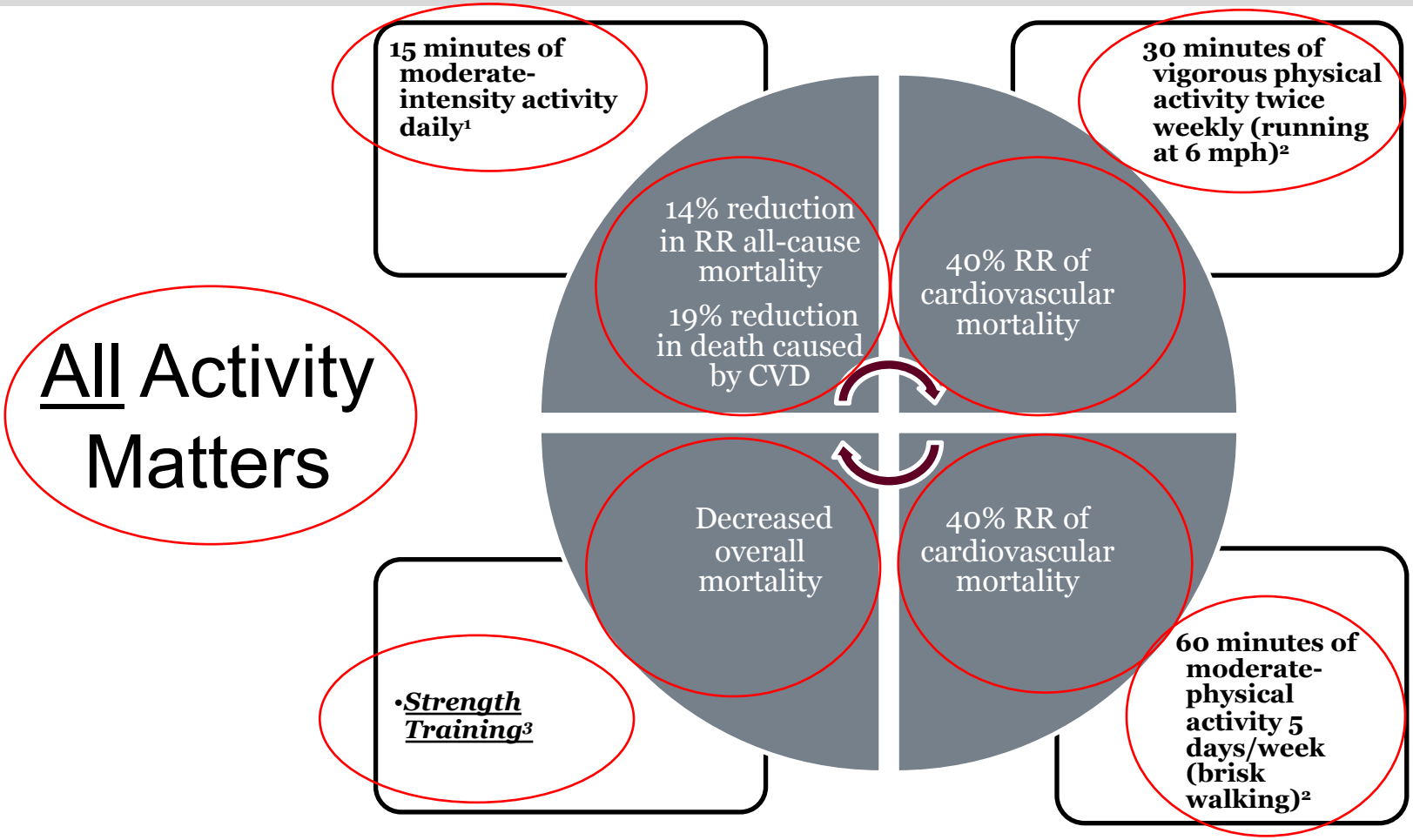
Diabetes Care 2022 Jan; 45(Supplement 1): S60-S82. https://doi.org/10.2337/dc22-S005

Activity & Exercise Recommendations

- **Most adults: 150 mins of mod-vigorous intensity aerobic activity/wk**
  - At least 3 days/wk, with no more than 2 consecutive days w/o activity
- **Shorter durations (min 75 min/wk) of vigorous-intensity**
  - or interval training for younger population & more physically fit individuals
- **2-3 days of resistance training/week** (non-consecutive days)
- **Reduce sedentary time**
- **Flexibility training & balance training are recommended**
  - 2–3 times/week for older adults with diabetes
- **Yoga & Tai chi** may be included based on individual preferences
  - Increasing flexibility, muscular strength & balance

Diabetes Care 2022 Jan; 45(Supplement 1): S60-S82. https://doi.org/10.2337/dc22-S005

All Activity Matters



[1]Chi Pang Wen, et al. *Lancet* 2011
[2]Duck-chul, Lee, et al. *Am College of Cardiology* 2014
[3]Kraschnewski, JL, et al. *Prev Med*. 2016

Assessing "Lifestyle Vitals"

- What kinds of physical activity do you do each week?
- What stops you from being more active?
- How many meals and/or snacks do you eat in a day?
- How many meals a week do you eat out? Do you skip meals?
- What is the hardest thing about managing your health right now?
- What do you fear most about your health right now?

Activity Rx

RX

NAME_____AGE_____

ADDRESS_____DATE_____

DIRECTIONS:

1. Add 2-5 mins each week to your walking routine to reach 10,000 steps a day most days of the week
2. Take a 5-10 mins walk at work when able
3. Walk or march in place during commercials when at home

_____

SIGNATURE

Lifestyle Medicine: Home Activity & Exercise

- Home activity & exercise videos
  - Beginner-friendly
  - Can be done in a small space
  - Can be paused & stopped prn

- Brain Injury Society of Toronto (BIST) & Toronto Rehab (LEAP)
  - https://bist.ca/resources-covid-19/gentle-exercise-videos/

- Gentle Exercise Videos & Chair Yoga, Tai Chi & Qi Gong Videos
  - Designed therapists for people with mobility issues and/or pain
  - Variations allow to select the challenge most appropriate for patients

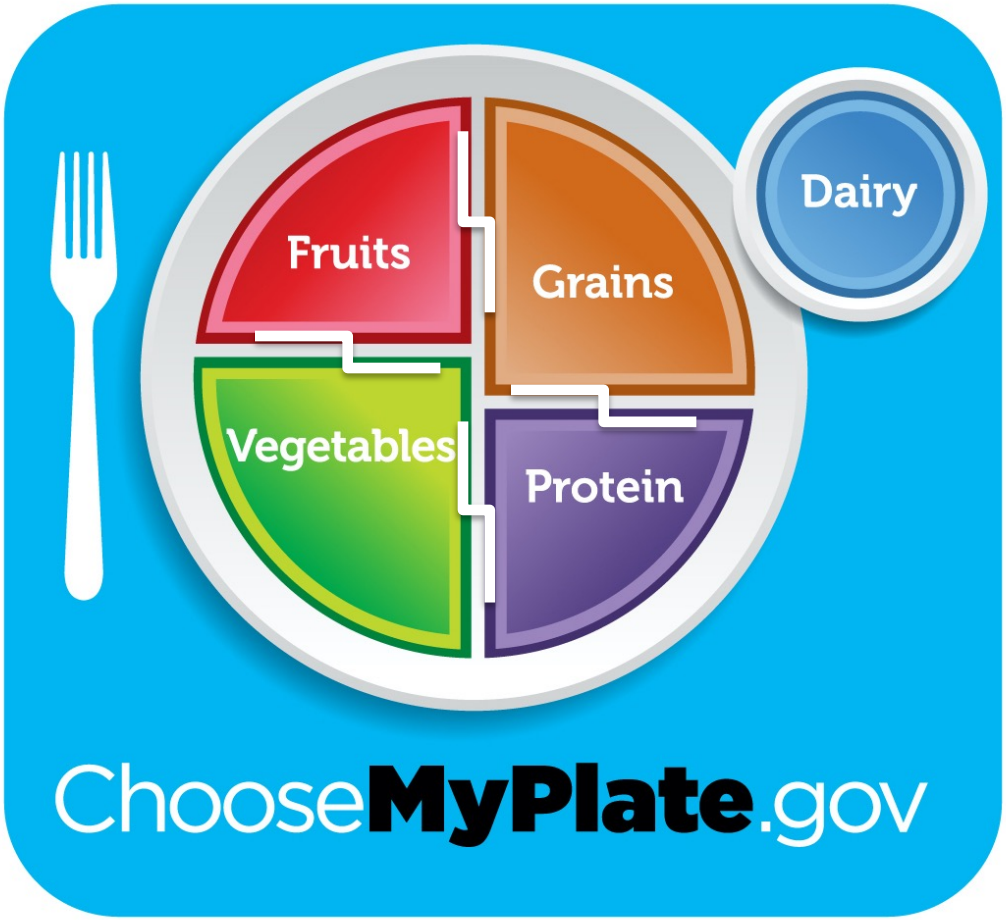
Healthy Eating/Medical Nutrition Therapy

General	✓ Portion control is the key → See space between portions! ✓ Don't skip meals and keep serving sizes consistent
Carbohydrates	✓ Reduce overall carbohydrate intake → Cut your carbs in half! ✓ Nutrient dense-carbs - minimally processed & high in fiber (fresh fruits/ vegetables, legumes, whole grains)
Fats	✓ Consumption of mono & polyunsaturated fats (avocados, certain plant oils, fish) ✓ Limit saturated fats & trans fat → Switch to fat-free this week! ✓ Choose fat-free or low-fat dairy products
Proteins	✓ Consume protein foods with low saturated fats (fish, egg whites, beans) ✓ Limit processed meats
Micronutrients	✓ Routine supplementation is not necessary ✓ No clear evidence on vitamins, supplements or herbs/spices improving BG control (Chromium; Vitamin D, cinnamon, aloe vera)

Grams J, et al. *Curr Obes Rep*. 2015 Jun;4(2):287-302. doi: 10.1007/s13679-015-0155-x

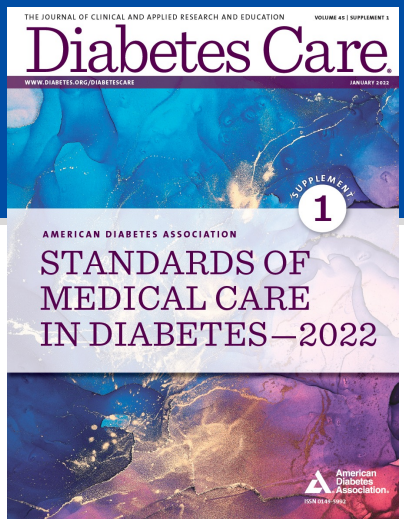
Plate Portions

- Half plate of fruits & vegetables
  - Focus on whole fruits
- Half plate of grains & protein
  - Focus on whole grains
  - Vary the protein
    - Seafood, beans, peas, nuts, seeds, soy products, eggs, lean meats & poultry
  - Move to low fat or fat free milk
- Drink water; avoid sugary drinks



ChooseMyPlate.gov: https://www.choosemyplate.gov

Proactive Management of Type 2 Diabetes



Diagnosis

Lifestyle modification & Diabetes Self-Management Education & Support (DSMES)

Glucose Control

Improve glycemic control to reduce symptoms & microvascular risk

Cardiovascular Risk

Reduce macrovascular risk especially by controlling lipids & blood pressure

Comorbidities

Manage co-morbidities (obesity, CVD, CKD, depression, fatty liver, eye & neuropathic disease)

Applying ADA Standards of Care to Clinic & Visits

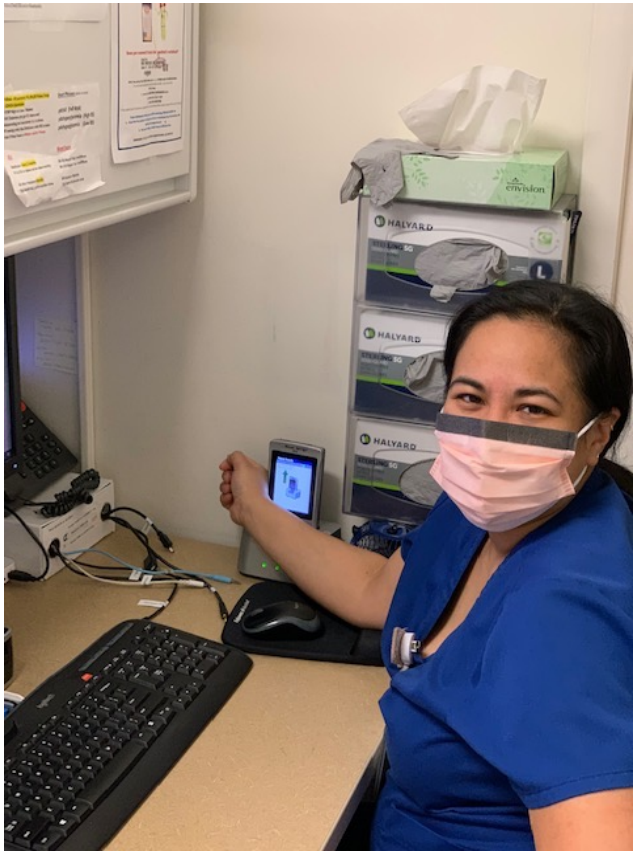
How do you do all this in 20–25-minute visits?

1. Facility support to implement standards of care for patients with DM
2. Systematic approach to patient encounters
3. Smart phrases!

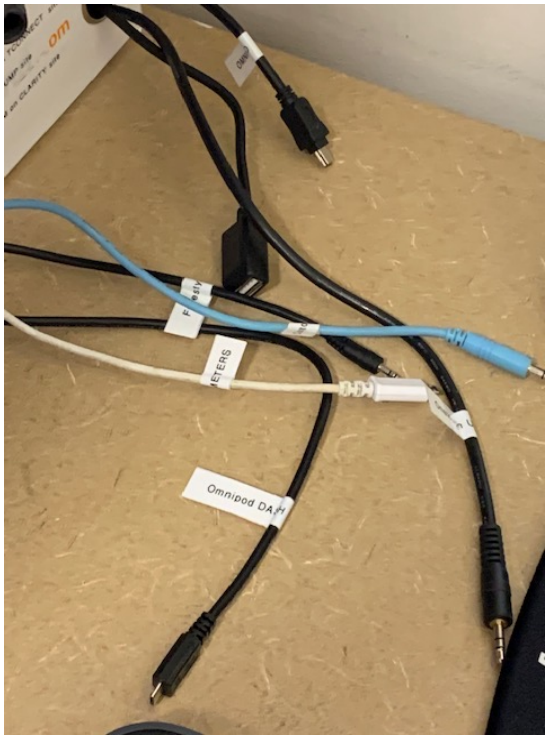
Clinic Support - YDC Team

Clinicians
Nurses
Dieticians
Medical Assistants
Administrative Staff

Clinic Support – "Crackerjack" Medical Assistants



MA manages BGM/CGM downloads & creates reports



MA has device connections & BG/CGM platform apps

MA obtains POC A1c

Systematic Approach

Engage & Explore

Screen & Monitor

Use Technology

Customize

Support & Follow

Disease Features – Diabetes specific ?'s

- **Type 1 or Type 2? On insulin or pills or both?**
- **What is your diabetes Rx regimen?**
- **Out-patient Self-BG Monitoring (BGM)? Meter or CGM?**
- **What are your BG ranges (AM / Noon / PM meals)?**
- **What was last A1c? Do you know what the A1c means?**
- **Do you have any complications of diabetes?**

Systematic Approach to BG/CGM reports

Minimize

- Hypoglycemia
- Glucose variability
- Hyperglycemia

Priorities

- Reduce hypoglycemia (TBR)
- Increase Time in Range (TIR)

Case 1

- 42 yo presents for T2DM follow-up
- Did not bring a BG log or meter → **No AGP**
- Reports the following perceived BG readings for "several months":
  - FBG: 110-120's range
  - PM pre-meal: 120-150's range
- **DM Rx:**
  - Metformin XL 1000mg BID
  - Insulin Glargine 30 units at HS
  - Insulin Lispro 8 units with meals
- **Data:** A1c: 9.2%

HbA1c & Estimated Average BG
5% – 90 mg/dL
6% - 120 mg/dL
7% - 150 mg/dL
8% - 180 mg/dL
9% - 210 mg/dL
10% - 240 mg/dL
11% - 270 mg/dL
12% - 300 mg/dL
13% - 330 mg/dL
14% - 360 mg/dL

- **What's the best next step for patient's diabetes management?**

FBG: Fasting blood glucose; AGP: Ambulatory Glucose Profile

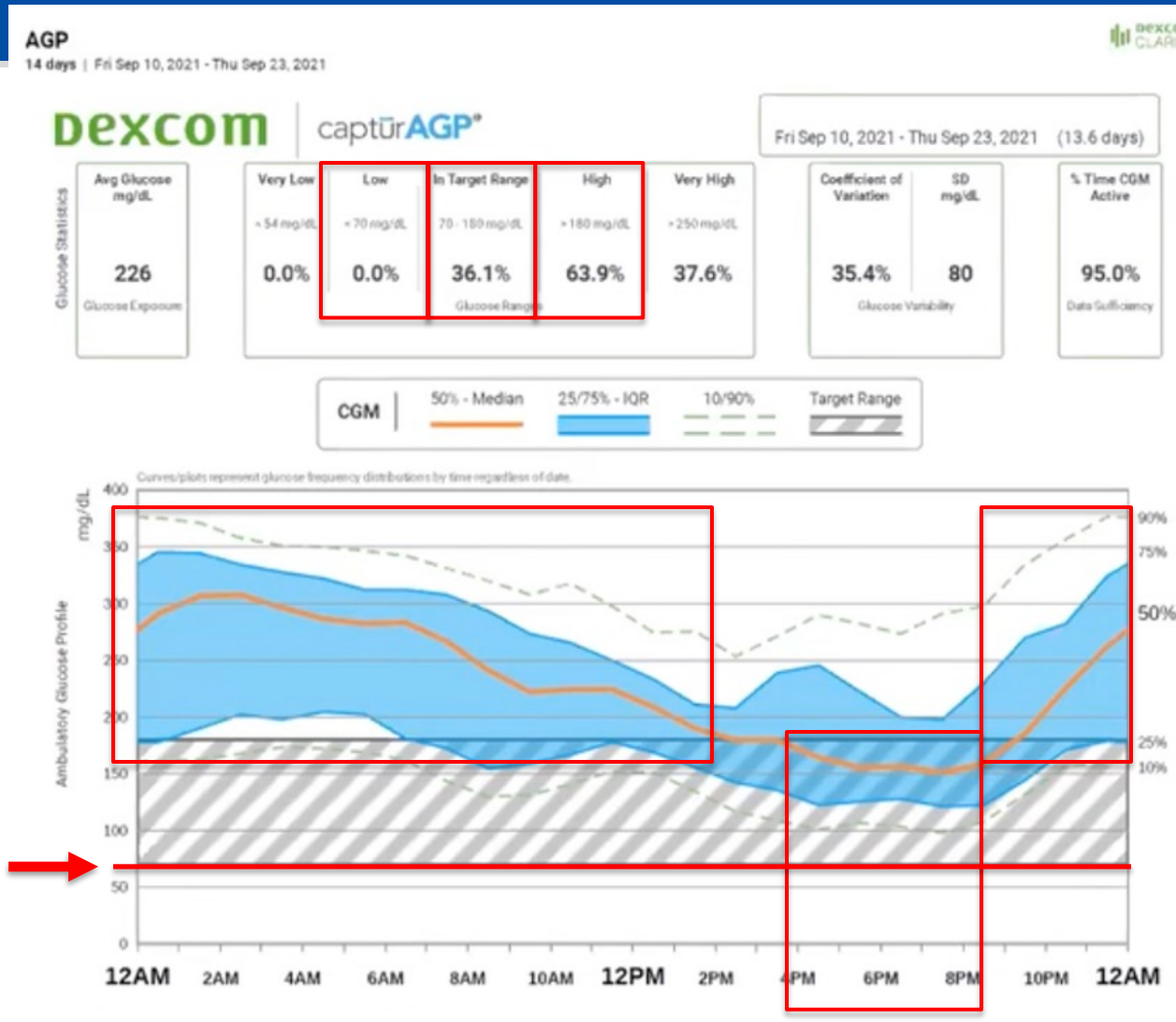
Case 1 – Poll Everywhere Question

What's the best next step for patient's diabetes management?

A. Increase insulin glargine by 20%
B. Increase insulin lispro with meals by 20%
C. Recommend the patient wear a professional CGM for 1 week
D. Continue the same diabetes regimen as patient is likely non-adherent

- **DM Rx:**
  - Metformin XL 1000mg BID
  - Insulin Glargine 30 units at HS
  - Insulin Lispro 8 units with meals

Case 1 -Patient returns to review Professional CGM results



AGP Assessment:

1. TBR: 0%
2. TIR: 36%
3. TAR: 64%
4. Avg BG: 226
5. SD: 80
6. CV: 35.4%

Patterns Assessment:

1. No hypoglycemia
2. TIR/Low BGs?: ~100s 4-8pm
3. Significant PP hyperglycemia mid-PM to mid-afternoon
4. BGs > goal most of day

Plan:

1. **Increase PM meal insulin lispro by 20% (to 10 units)**
2. **Increase insulin glargine by 10% (to 33 units)**

PP: Post prandial SD: Standard deviation; CV: Coefficient of Variation

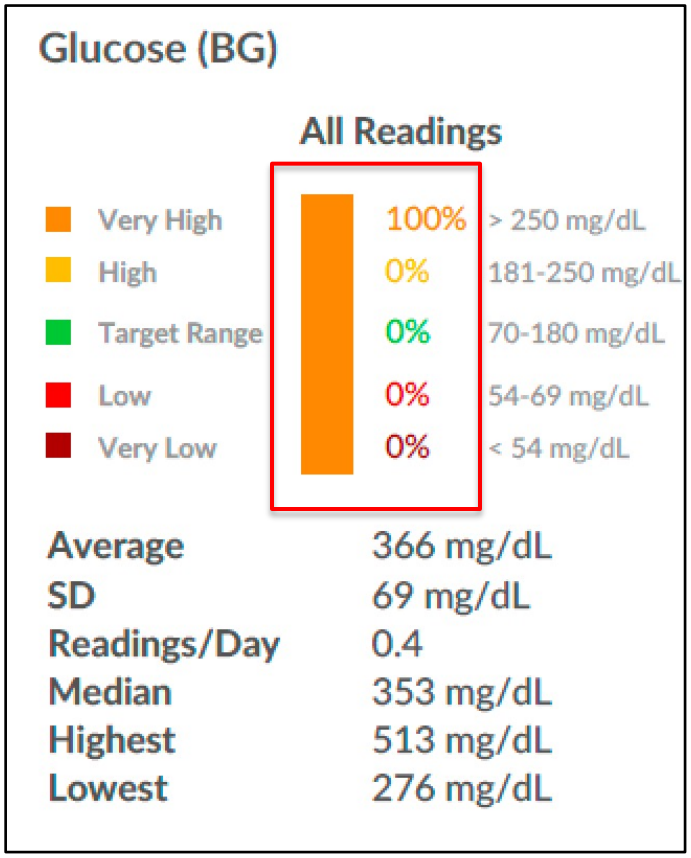
Case 2

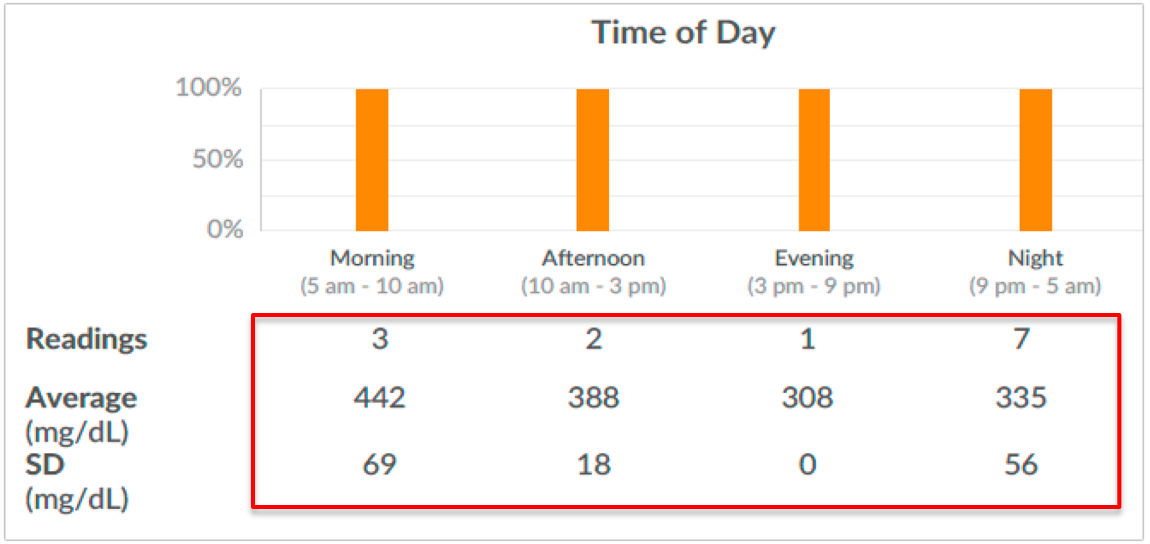
- 58 yo with a PMH of T2DM (Dx: '19) & Overweight (BMI 26) presents for DM f/u & complains of persistent symptomatic hyperglycemia.
- **DM Meds:**
  - Metformin XR 500mg twice daily before meals
- **Data:** BG 395 & Udip NEG for ketones
- **POC A1c & trends:**

Lab Results

Component	Value	Date
HGBA1C	13.8 (H)	11/28/2021
HGBA1C	6.1	09/13/2021
HGBA1C	6.2	03/15/2021
HGBA1C	5.8	09/14/2020

Case 2 - Persistent symptomatic hyperglycemia





Glycemia Report:

Date of Interpretation:	12/3/2021
Data period:	11/20/21 - 12/3/2021
Readings:	13
Mean BG (mg/dL):	366
Range BG mg/dL):	276-513
% Hyperglycemia (>180):	**100%**
% at Target (70-180):	0%
% Hypoglycemia (<70):	0%

Case 2 – A/P: Above goal A1c & AGP

Assessment:

- **Uncontrolled T2DM**
- **A1c at diagnosis 7.1% | A1c range 5.8-7.1% last 3+ yrs on MTF 500mg BID**
- **A1c now 13.8% & AGP from BG meter shows 100% hyperglycemia**
  - Patient changed MTF "by mistake" to 500mg DAILY
- **Increased suspicion for possible etiologies:**
  - "The patient is non-adherent."
  - Developing insulinopenia given FHx of brother with T1DM?
  - Increased insulin resistance with glucose toxicity with inadvertent med dosing lapse?
- **Plan:**
  - Add Lantus insulin 12 units daily (0.2 x kg daily) & increase MTF XR to 1000mg BID
  - Check C-pep, GAD Ab, IA-2 Ab, Insulin AutoAb, Zinc transporter Ab
  - Check BG 4x daily
  - Send BG readings via MyChart & for further Lantus dose titrations prn
  - Consider addition of GLP-1 once A1c < 10% if indicated
  - Follow-up with PA Weber in 4-6 weeks

MTF - Metformin

A Word on Adherence…

"The patient is non-adherent."

- **The act or quality of "sticking to something"…**
- **The extent to which a patient continues the agreed-upon mode of treatment under limited supervision**

Influences of Adherence

- Language
- Financial
- Transportation
- Cultural differences
- Value differences
- Complicated health system
- Educational background
- Cognitive understanding
- Underlying disease process
- Gender of provider

"The patient is non-adherent…
…because…"

"Can you tell me why you're having a hard time?"
"How do you think I can help you with that?"

Case 2 – Telehealth 1 Month Follow-up

Data:

- **A1c now 11.3% (10 days ago)**
- **AGP: 90% TIR & 10% TAR (For last 2 weeks)**
  - Rx: MTF XR 1000mg 2x daily & Lantus 20 units daily (up-titrated between visits)
- **Labs:**
  - NL range C-peptide & NEG GAD Ab, IA-2 Ab, Insulin AutoAb, Zinc transporter Ab

Assessment:

- **Uncontrolled T2DM with improving A1c trends**
  - **Apparent glucose toxicity & related insulin resistance in setting of med dosing lapse**

Plan:

- **Continue Lantus daily & MTF XR 1000mg BID**
- **Consider injectable or oral GLP-1 with transition off insulin in future**
- **Continue BG monitoring & send via MyChart in 3 weeks**
- **Follow-up with PA Weber in 6 weeks**

Case 3

- 62-year-old with T2DM (‘20), Non-ischemic CVD & a BMI of 38. Complains that she’s only lost a few pounds after multiple unsuccessful attempts at lifestyle changes including BGM, activity & diet changes.

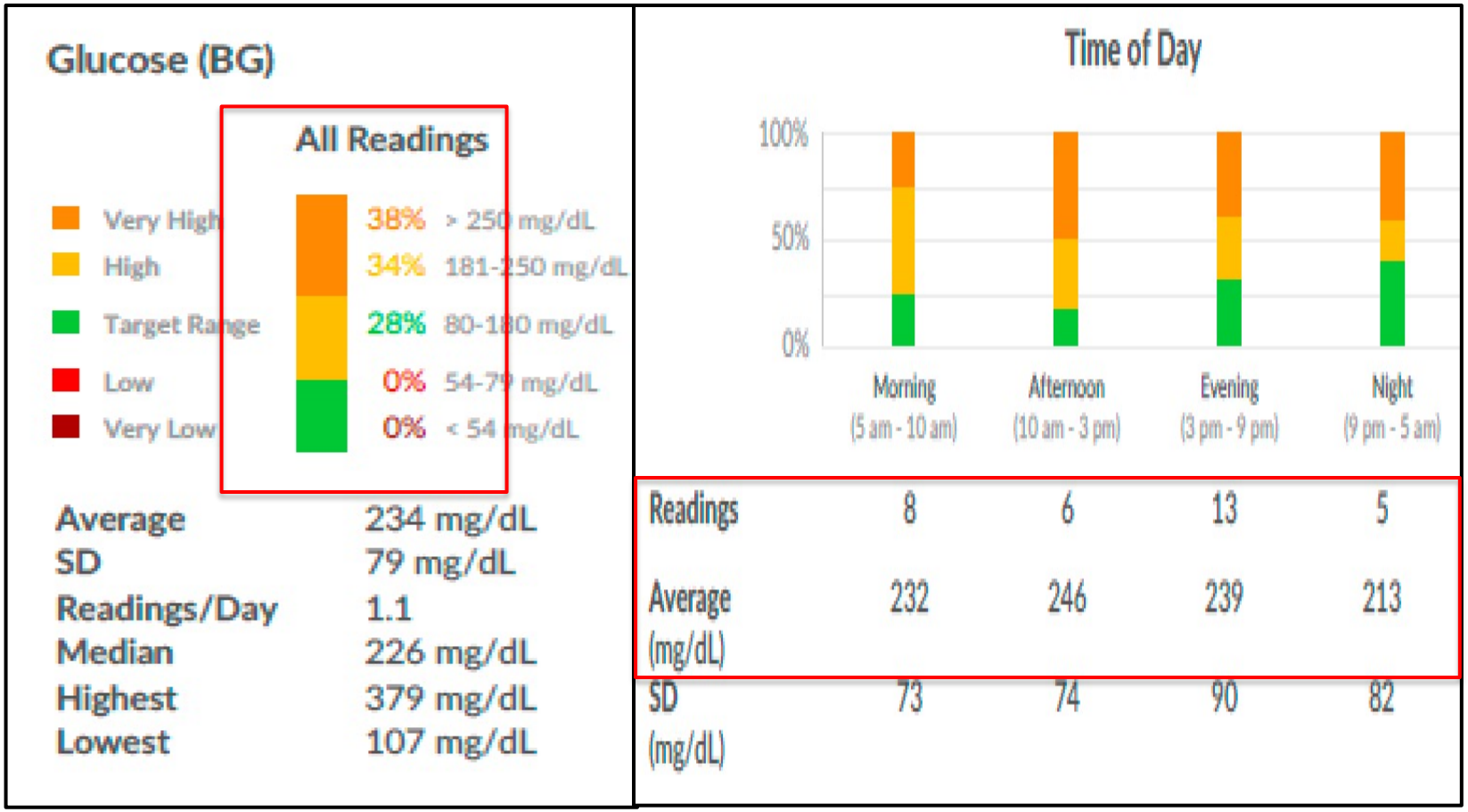
- **DM Meds:**
  - Metformin XR 2000mg twice daily before meals

- **Data:** A1c trends (A1c drawn ~1 month before visit; Goal of A1c 6-7%:

Lab Results

Component	Value	Date
HGBA1C	7.8	09/15/2021
HGBA1C	7.9	03/10/2021
HGBA1C	7.3	09/02/2020
HGBA1C	7.7 (H)	07/10/2020
HGBA1C	8.3 (H)	04/30/2020
HGBA1C	12.0 (H)	02/10/2020

Case 3 - AGP



AGP: Ambulatory Glucose Profile

Case 3 – A/P: Above goal A1c, AGP & weight

Assessment:

- **Uncontrolled T2DM with CVD hx & overweight on MTF 1000mg BID**
  - Above goal A1c 7.8% (goal 6-7%)
  - Above goal AGP: 28% TIR & 72% TAR
- **Weight above goal - BMI of 38 & motivated for lifestyle changes**
  - Blaming herself for failing unrealistic goals
  - Not giving herself credit for small successes
  - Assess "Lifestyle VS" & employ "SMART" goals
- **Plan:**
  - **Lifestyle Med Plan:**
    - Download Pedometer to smart phone
    - Activity Rx given: 2000 steps/day x 1 mo & aim to increase to 10K steps/day
  - **Add GLP-1 → Ozempic 0.25 x 4 wks /0.5 x 4 wks/1 mg weekly**
  - **Continue MTF XR 1000mg BID**
  - **Check BG 2x daily & send via MyChart BG**
  - **Follow-up with PA Weber in 3 months**

Case 3 - 3 Month Follow-up Data

DM Meds:

- Metformin XR 2000mg twice daily before meals
- Ozempic (Semaglutide) 0.5mg sc weekly

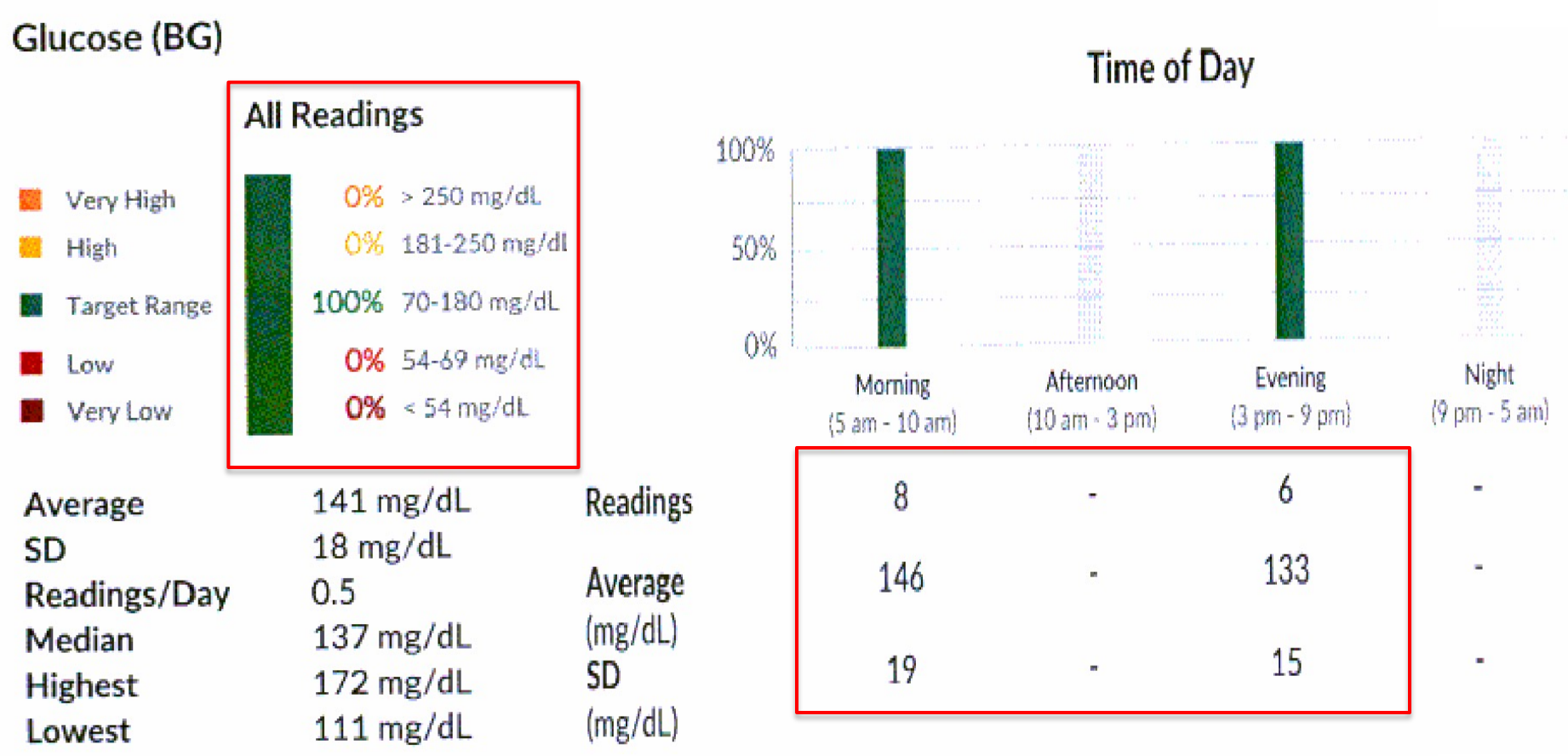
Lifestyle Vitals:

- Using smartphone pedometer & averaging 5-7 K steps/day
- Maintaining small portion sizes & healthier nutrient balance

Data:

- Wt loss 7lbs
- A1c 6.8%
- **AGP?**

Case 3 – AGP: 3 Month Follow-up Data



AGP: Ambulatory Glucose Profile

Case 3 - 3 Month Follow-up A/P

DM Meds:

- Metformin XR 2000mg twice daily before meals
- Ozempic (Semaglutide) 0.5mg sc weekly

Lifestyle Vitals:

- Using smartphone pedometer & averaging 5-7 K steps/day
- Maintaining small portion sizes & healthier nutrient balance

Data:

- Wt loss 7lbs
- A1c 6.8% & AGP 100% TIR; SMBG 2x/day

Assessment: Controlled T2DM & 7lb Weight loss

Plan:

- **Lifestyle Plan:** Reassess for confidence in maintaining
- **Consider maintenance vs increase of Ozempic for wt loss benefit?**
- **Continue MTF XR 1000g BID**
- **Check BG 2x daily 2-3x/week for surveillance**
- **Follow-up in 3 months**

Case 4

- 71 yo with a PMH of T2DM x 20+yrs, HTN, HLD, Stage 3 CKD.

DM Meds:

- Lantus 32 U at HS
- Victoza 1.2 mg in AM
- Metformin XR 1000 mg QD

Data:

- A1c trends; Goal A1c 6-7%:

Component Latest Ref Rng & Units	7/1/2020	2/26/2020	11/22/2019
Hemoglobin A1c 4.0 - 5.6 %	8.6 (H)	7.0 (H)	5.8
Estimated Average Glucose mg/dL	200	154	
eGFR mL/min/1.73m2	54	52	58

ADA. Diabetes Care. 2022;45:S155-S174
KDIGO CKD Work Group. Kidney Int Suppl. 2013;3:1-150.

Case 4 – AGP

AGP by Libre CGM:

- Libre 14-day sensor; Also checks BG 2-4X/day
- Denies hypos or low BGs < 70

Libre Flash Data Report (hand review):

Date of Interpretation:	7/1/20
Data period:	6/17/20 - 7/1/20
Readings:	xx
Mean BG (mg/dL):	168
Range BG mg/dL):	68-255
% Hyperglycemia (>180):	42%
% at Target (70-180):	56%
% Hypoglycemia (<70):	2%

Average BG (mg/dL) values:

AM meal	182
Noon	188
PM meal	196
HS	183

Case 4 – A/P: Above goal A1c, AGP, CKD & CVD Risk

Assessment:

- **Uncontrolled T2DM, Stage 3 CKD & CVD FRS 10%**
  - Above goal A1c 8.6% (goal 6-7%)
  - AGP by isCGM: < 2% infrequent hypos & none overnight |56% TIR | 42% TAR
  - Pre-meal BG averages > goal of 180s
  - CKD & eGFR 54 on ACEi | Elevated CVD FRS 10%

DM Meds:

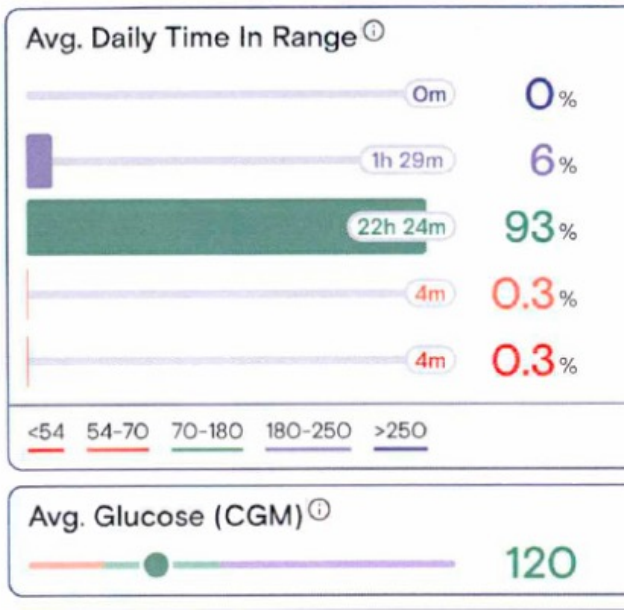
- Lantus 32 U at HS
- Victoza 1.2 mg in AM
- Metformin XR 1000 mg QD

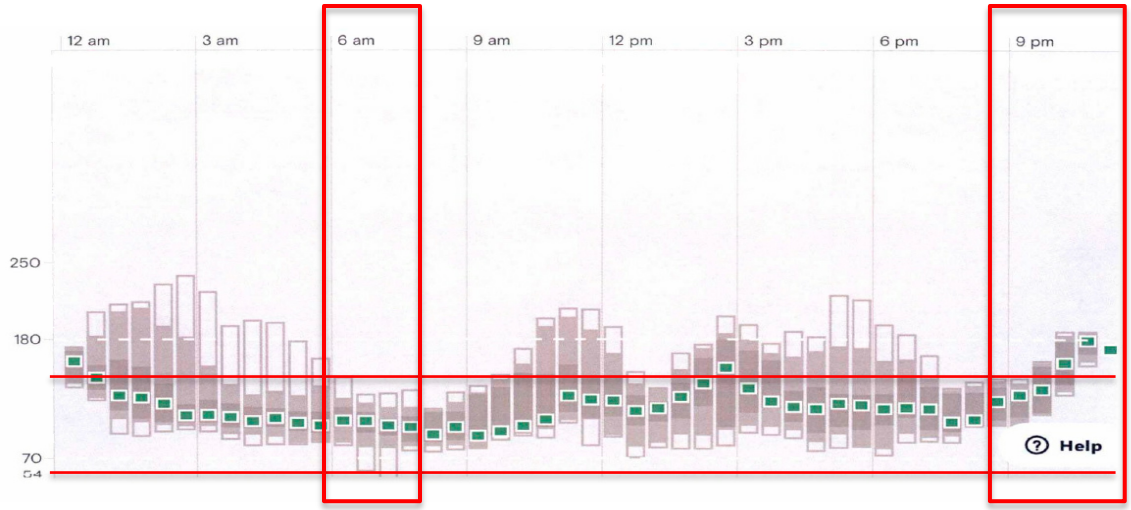
Plan:

- **Add SGLT2i for potential glycemia, MACE, HF benefits**
- **Track CKD closely**
  - **If GFR <45, stop metformin therapy**
  - **If GFR <30, stop SGLT2i therapy**
- **Reduce Lantus to 28u at bedtime**
- **Continue GLP-1 (Liraglutide|Victoza) & renal-dose MTF**
- **Check BG 4x daily x 2 weeks & send via MyChart BG**
- **Follow-up in 3 months**

Case 4 - 3 Month Follow-up Data & A/P

	11/20/2020	7/1/2020
Hemoglobin A1c 4.0 - 5.6 %	**6.0**	8.6 (H)
eGFR mL/min/1.73m2	**> 60**	54





Assessment: Controlled T2DM

- At goal A1c & AGP & improved GFR
- No frequent or significant hypos

Plan:

- Continue SGLT2, GLP-1, basal insulin & renal-MTF
- Monitor GFR every 6 months
- Scan BG 2x daily & with hypo symptoms
- Follow-up in 3 months

SmartPhrases: Glycemia Reports – BG Meter

~~SMBG:~~ → BGM*

-Uses BG meter | Uses Libre CGM | Uses Guardian Link or Dexcom CGM

-Checks BG | Scans 2-4x/day qAC AM & PM & when feeling hypos

-Hypos: 3-4x/wk & mostly in late AM; some to low 50's

	Pre-Meal BG (mg/dL)	2hr PPG (mg/dL)
Breakfast	xx	
Lunch	xx	
Supper	xx	
Bedtime	xx	

*Summary of Revisions: *Standards of Medical Care in Diabetes - 2022. Diabetes Care* 2022;45(Suppl. 1):S4

SmartPhrases: Glycemia Reports – BG or CGM Downloads

SMBG:

-Checks BG 2-3x/day before AM & PM meals & when feeling hypos

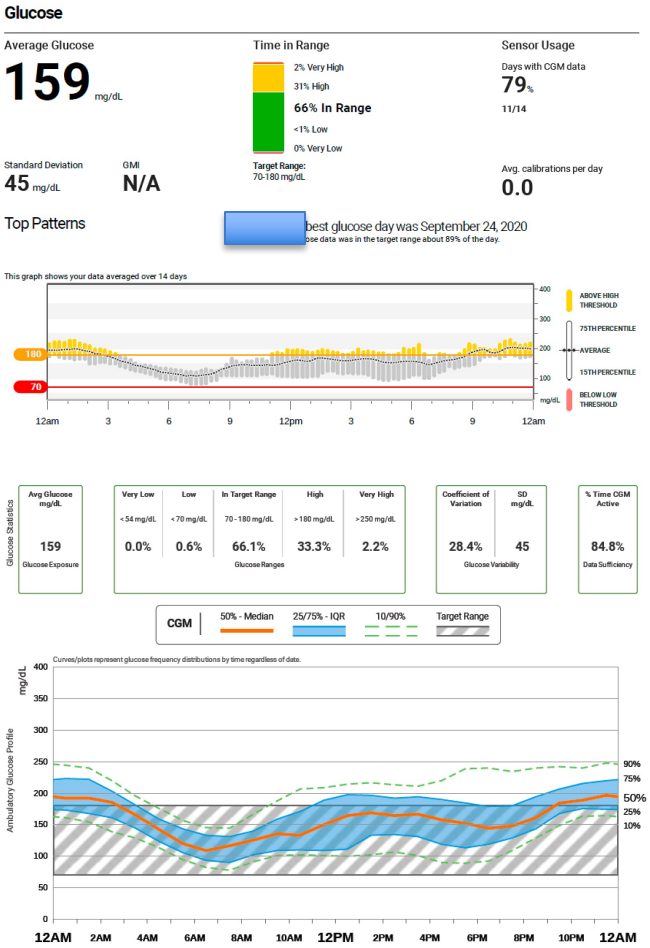
-Hypos: 3-4x/wk & mostly in late AM; some to low 50's

<u>Glycemia Data Report:</u>

Date of Interpretation:	1/3/2022	
Data period:	**xx**-1/3/2022	
Readings:	xx	
Mean BG (mg/dL):	xx	
Range BG mg/dL):	xx-xx	**Previous AGP:**
% Hyperglycemia (>180):	xx	40%
% at Target (70-180):	xx	54%
% Hypoglycemia (<70):	xx	6%

Average BG (mg/dL) values by meals:

AC Brkfst (AM Fasting):	xx
AC Lunch:	xx
AC Dinner:	xx
HS:	xx



SmartPhrases –Diabetes Health Maintenance

- **DM HM**
  - **CVD Risk Reduction:** No PMH of CAD, PVD or CVA
    - **HTN:** BP at goal; on ARB & HCTZ; no routine exercise; activity plan as directed.
    - **HLD:** FLP UTD & LDL/Tg above goals; increase statin from mod to high intensity
  - **Neph/CKD Risk Reduction**: Cr/GFR: 0.93/110; UACR: UTD & POS. On ACEi.
    - Check UACR at next visit if glycemia improved
  - **Ophthal:** Denies DPR; no complaints/changes in vision. Exam: UTD (Nov '21)
    - Ophthal f/u in 2022
  - **Pod:** No PMH Sensory neuropathy; no complaints; Exam: NL MF screen (Jan '22)
    - Repeat MF screen annually.

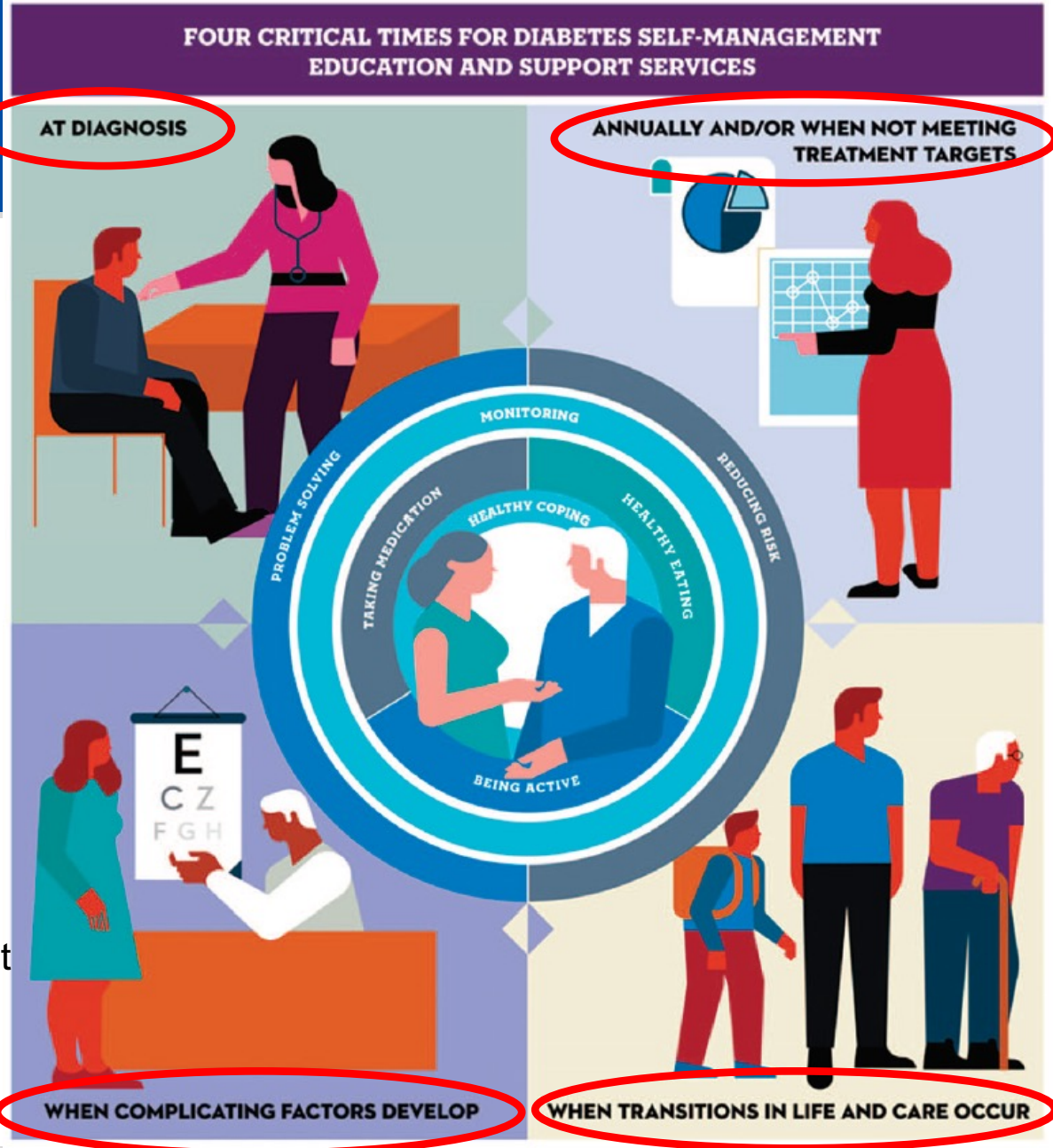
UTD: Up to date
UACR: Urine albumin creatinine ratio
DPR: Diabetes Proliferative Retinopathy

Approach to the Patient

- Engage & Explore
- Screen & Monitor
- Customize
- Use Technology
- **Support & Follow**

DSMES*

- ***Comprehensive clinical, educational, psychosocial, & behavioral care***
- ***Typically provided by DM specialty providers***
- ***Four critical times to provide & modify DSMES***

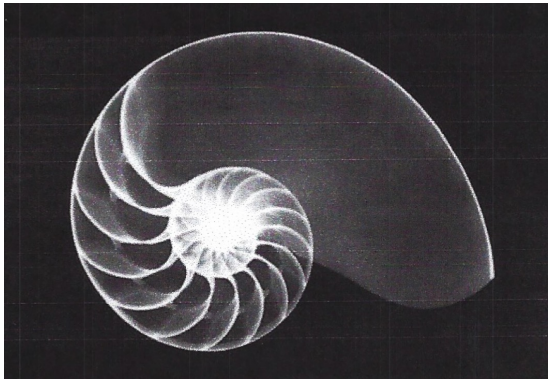


*DSMES: Diabetes Self-Management Education & Support
DM: Diabetes mellitus

Powers MA, Bardsley JK et al. *Diabetes Self-management Education and Support (DSMES) in Adults with Type 2 Diabetes: A Consensus Report* of the ADA, ADCES, AND, AAFP, AAPA, AANP, APhA. The Diabetes EDUCATOR. Volume 46, Number 4, August 2020.

Five Practices for Promoting Patient-Centered Care[1,2]

- Prepare with intention
- Listen intently & completely
- Agree on what matters most
- Connect with the patient's story
- Explore emotional cues



The Chambered Nautilus Approach…

[1]Sanders L, Fortin AH 6th, Schiff GD. Connecting with patients—the missing links. JAMA. 2020;323(1):33-34
[2]Zulman DM, Haverfield MC, Shaw JG, et al. Practices to foster physician presence and connection with patients in the clinical encounter. JAMA. 2020;323(1):70-81.

DM 101 Session Summary

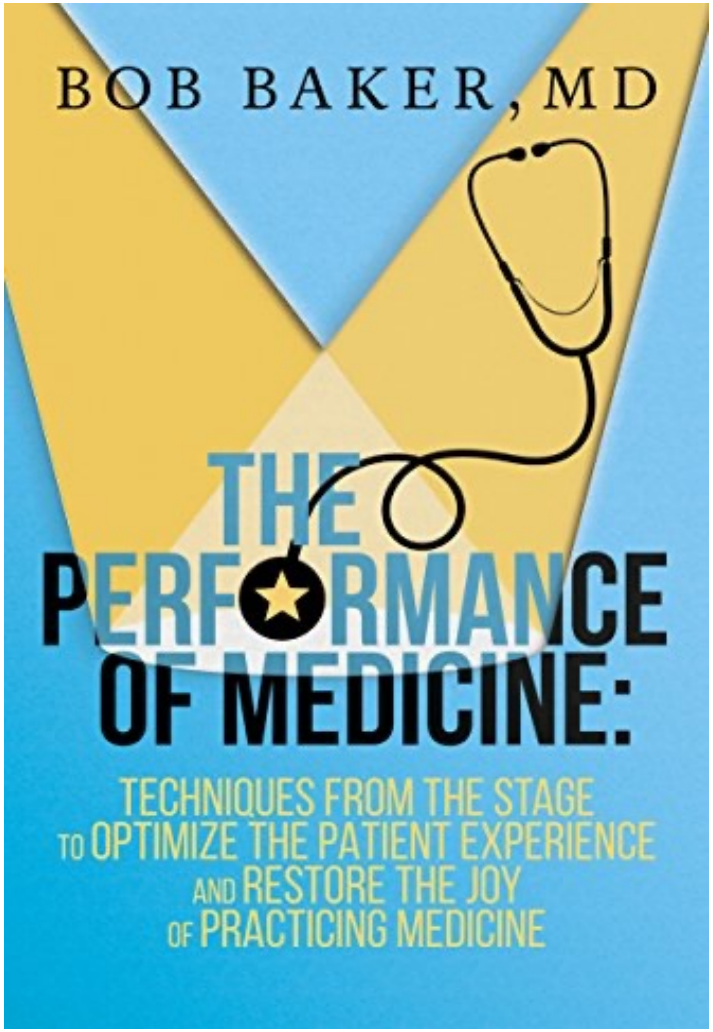
- Diabetes management strategies should focus on:
  - Patient-centered care practices – The 5 Practices!
  - Shared-decisions for "individual" & "incremental" changes
  - Lifestyle VS & interventions at every visit (activity, nutrition & weight loss)
  - Pharmacologic interventions (when appropriate)
  - Routine follow-up

- Behavior change is based on factors that involve BOTH patient & provider
  - Communicate & connect without judgment
  - Listen attentively & convey a desire to collaborate

- Uncover influences of adherence & attempt to reduce impact

- Stress "progress over perfection"

Optimize Patient Experience & Enjoy Your Role



"The Performance of Medicine: Techniques From the Stage to Optimize the Patient Experience and Restore the Joy of Practicing Medicine" by Bob Baker. April 2018.

Universal Truth on Communication…

"The main problem with communication is the assumption that it has occurred."

George Bernard Shaw

Contact Information

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Morgan PA et al. Impact of physicians, nurse practitioners, and physician assistants on utilization and cost of care for complex patients. 2019. https://pubmed.ncbi.nlm.nih.gov/31158006/

Powers MA et al. Joint Position Paper: Diabetes self-management education and support for type 2 diabetes. 2015. https://pubmed.ncbi.nlm.nih.gov/26047627/

Valentine V. Your diabetes care provider in the future is probably an NP or PA. 2014. Clinical Diabetes. 32(4): 145-147.https://doi.org/10.2337/diaclin.32.4.145. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4220600/

Weber J. Self-Management and Lifestyle Medicine for Comorbid Diabetes and Heart Disease. Clinical Advisor. May 2021. https://www.clinicaladvisor.com/counselingconnection/self-management-lifestyle-medicine-for-comorbid-diabetes-heart-disease/

Resources - Diabetes Education Programs

- Assist in developing customized plans
- Provide patients tools & ongoing support
- Improve diabetes outcomes including CVD risk reduction
- Covered by most commercial healthcare plans, Medicare & Medicaid

- Find a Diabetes Education Program in Your Area

  Association of Diabetes Care and Education Specialists

Resources - Lifestyle Medicine

Applications

- CalorieKing ®
- MyFitness pal ®
- MyPlate Calorie Counter ®
- Pacer Pedometer ®
- DeckWorkout ®
- 30 day fitness ®
- Home Workout ®
- Map My Walk ®

Website Resources

- https://www.diabeteseducator.org
- https://www.choosemyplate.gov/
- https://www.cdc.gov/diabetes/prevention/resources/curriculum.html
- https://diabetes.org/diabetes

Resources - Harvard Institute of Lifestyle Medicine

"Our mission is to reduce lifestyle-related death and disease in society through clinician-directed interventions with patients."

Harvard School of Medicine – Institute of Lifestyle Medicine
https://www.instituteoflifestylemedicine.org/

Resources - Diabetes in Primary Care Interest Group

Diabetes In Primary Care Interest Group

Re: Exercise - Helping Patient Develop Plan

Reply All Online	Reply All via Email	Reply to Sender Online	Reply to Sender via Email

ADA Primary Care Interest Group: https://procommunity.diabetes.org/forums/community-home/digestviewer?tab=digestviewer&CommunityKey=43ac6485-ef60-4268-b7ed-862366143396