CMHC
Cardiometabolic Health Congress

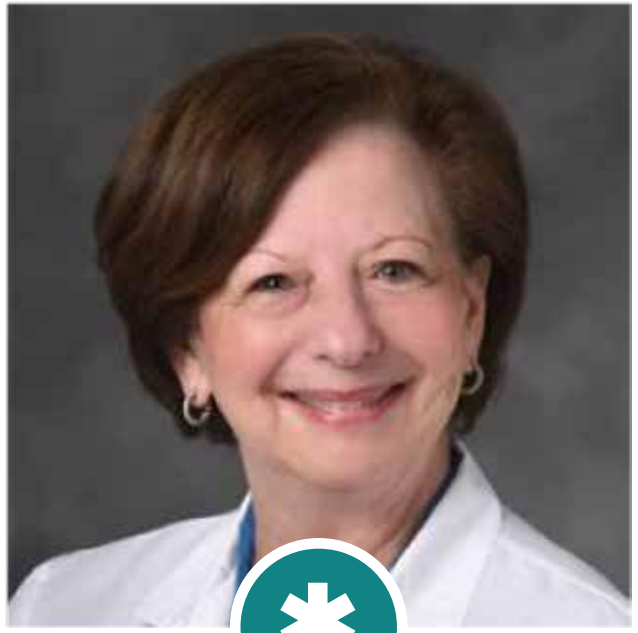
EXPERT PERSPECTIVES AND DISCUSSIONS

# BREAKING THROUGH INERTIA:

## How To Initiate and Maintain Insulin Therapy in Patients with Type 2 Diabetes


*Supported by an educational grant from Novo Nordisk*

# Welcome & Introductions



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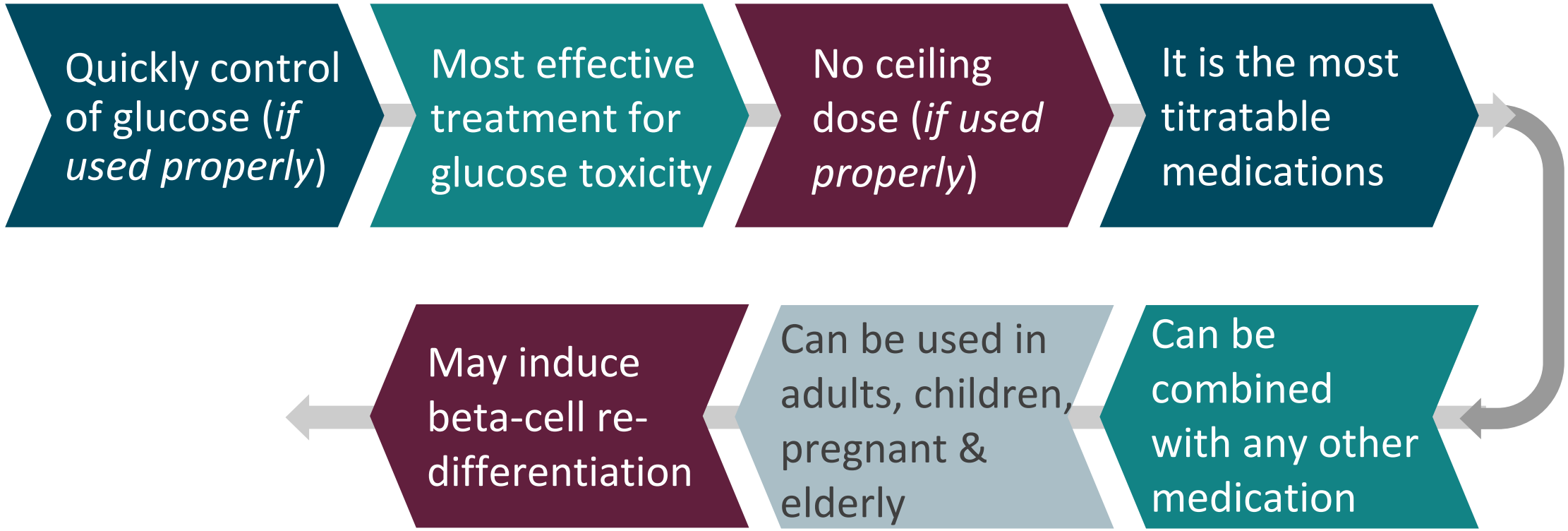
# Overview of Insulin Therapy in T2DM

Jay H. Shubrook, DO, FAAFP, FACOFP

# Goals and Benefits of Insulin Therapy

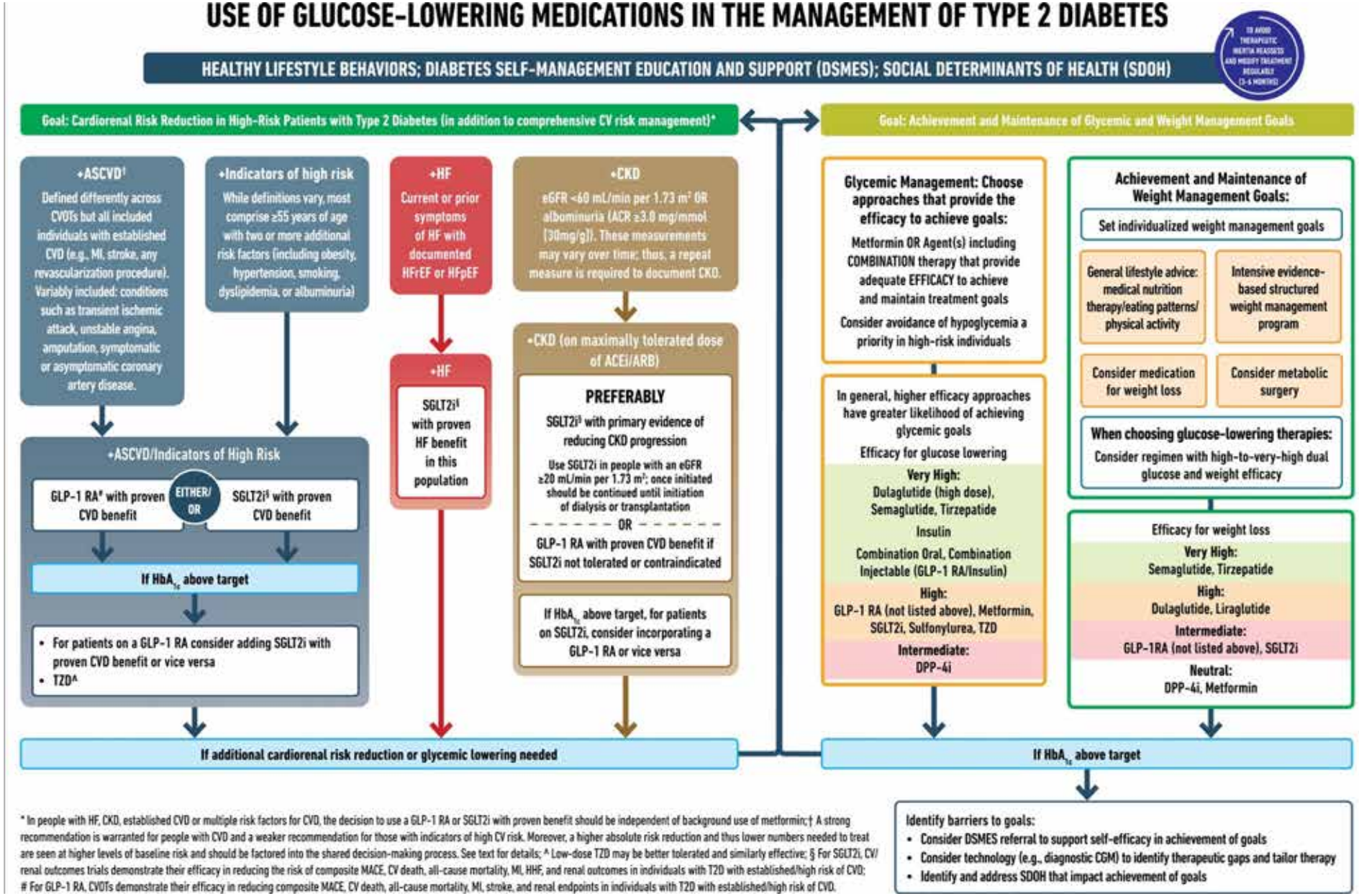


# Pre-Test | Question 1

**Which is the most appropriate to start insulin therapy?**

a. At diagnosis – both type 1 and type 2 diabetes
b. Any time the patient presents with catabolic symptoms (fasting Bg >200mg/dl, Random BG 300mg/dl, A1c >10% , Polys
c. If a patient presents with a random BG of >300mg/dl and an A1c of 8.5%
d. After all other anti-hyperglycemic medications have been tried

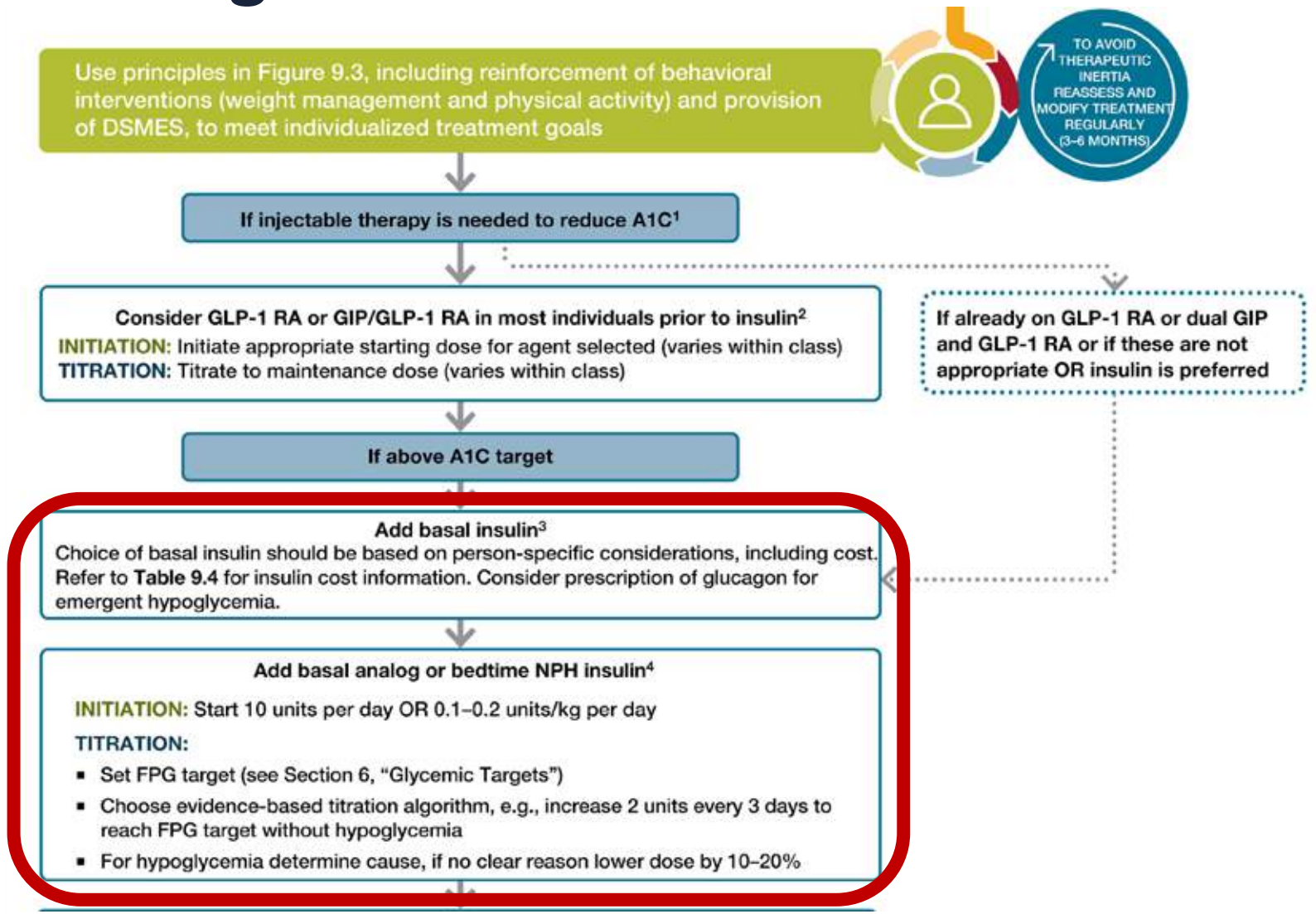
# USE OF GLUCOSE-LOWERING MEDICATIONS IN THE MANAGEMENT OF TYPE 2 DIABETES




* In people with HF, CKD, established CVD or multiple risk factors for CVD, the decision to use a GLP-1 RA or SGLT2i with proven benefit should be independent of background use of metformin; † A strong recommendation is warranted for people with CVD and a weaker recommendation for those with indicators of high CV risk. Moreover, a higher absolute risk reduction and thus lower numbers needed to treat are seen at higher levels of baseline risk and should be factored into the shared decision-making process. See text for details; ^ Low-dose TZD may be better tolerated and similarly effective; § For SGLT2i, CV/renal outcomes trials demonstrate their efficacy in reducing the risk of composite MACE, CV death, all-cause mortality, MI, HHF, and renal outcomes in individuals with T2D with established/high risk of CVD; # For GLP-1 RA, CVOTs demonstrate their efficacy in reducing composite MACE, CV death, all-cause mortality, MI, stroke, and renal endpoints in individuals with T2D with established/high risk of CVD.

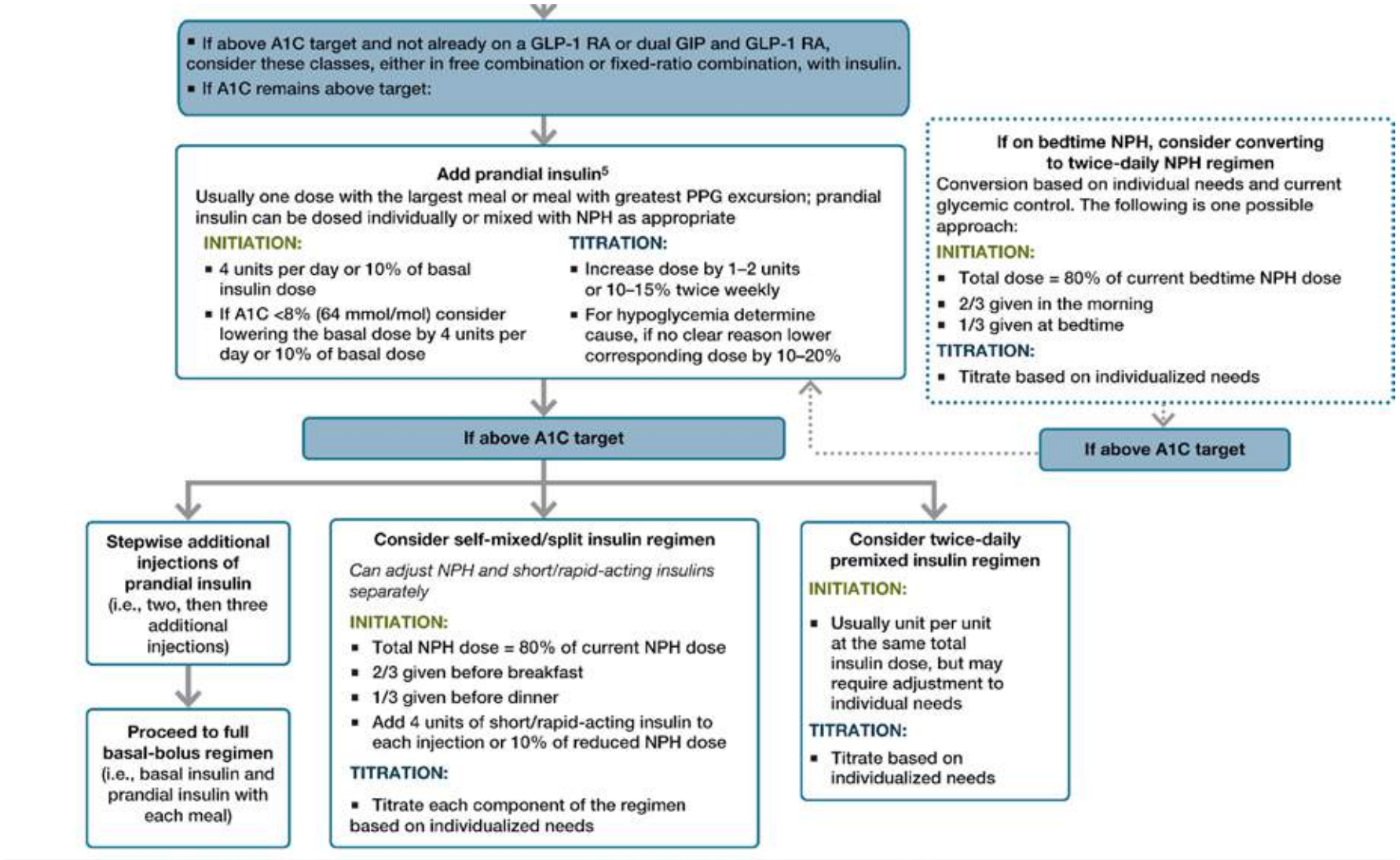
American Diabetes Association – 2023 Standards of Care. *Diabetes Care*. 2023 46.Supplement_1: S140-S157

# ADA Injection Algorithm Part 1



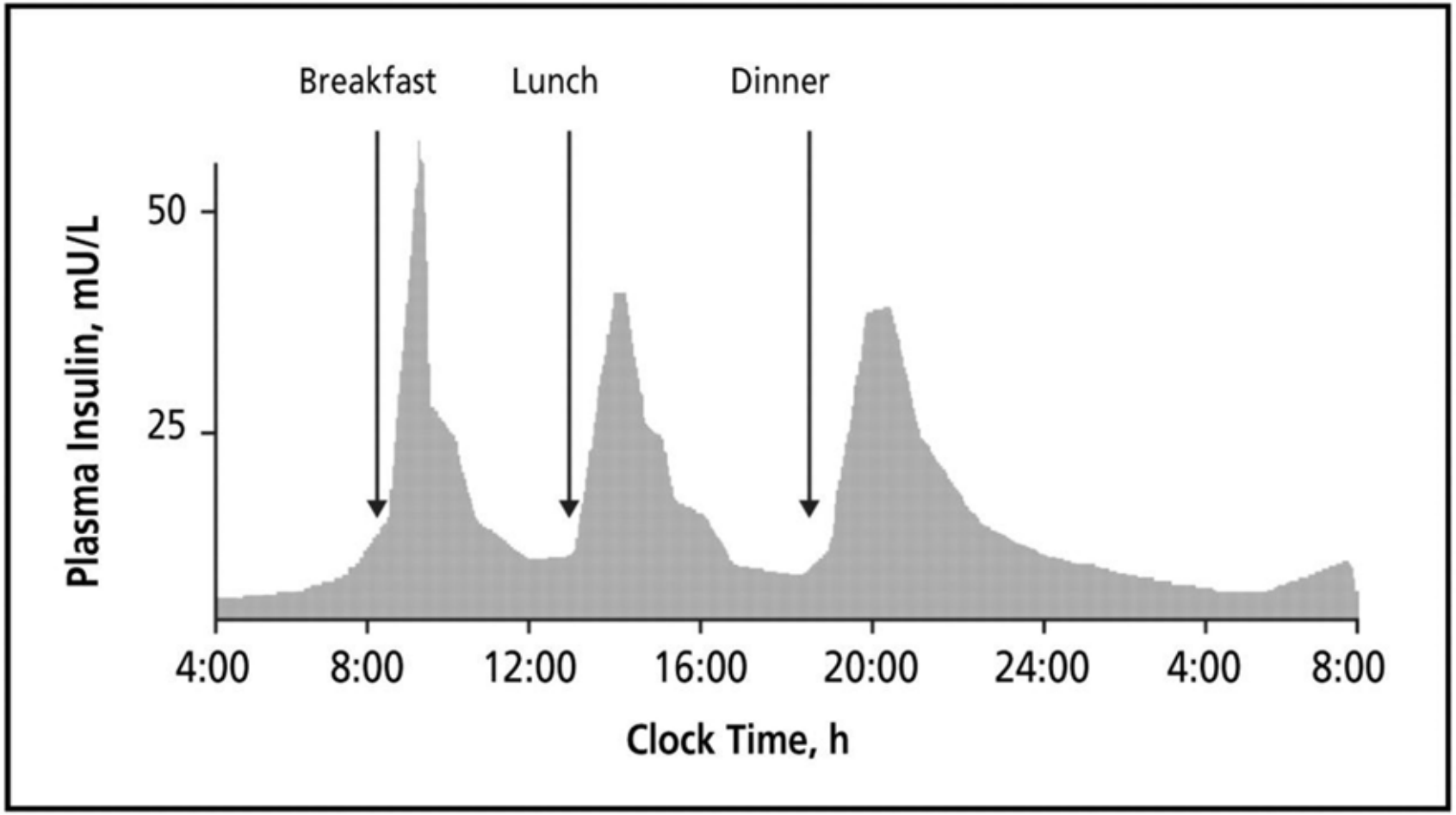

American Diabetes Association – 2023 Standards of Care. *Diabetes Care*. 2023 46.Supplement_1: S140-S157

# ADA Injection Algorithm Part 2




American Diabetes Association – 2023 Standards of Care. *Diabetes Care*. 2023 46.Supplement_1: S140-S157

# Physiologic Insulin Release



# Components of Insulin Action

## Basal Insulin

- Required for resting metabolic needs
- Suppresses glucose production at night and between meals
- Stays relatively constant
- Usually is half of total daily insulin needs

## Prandial Insulin

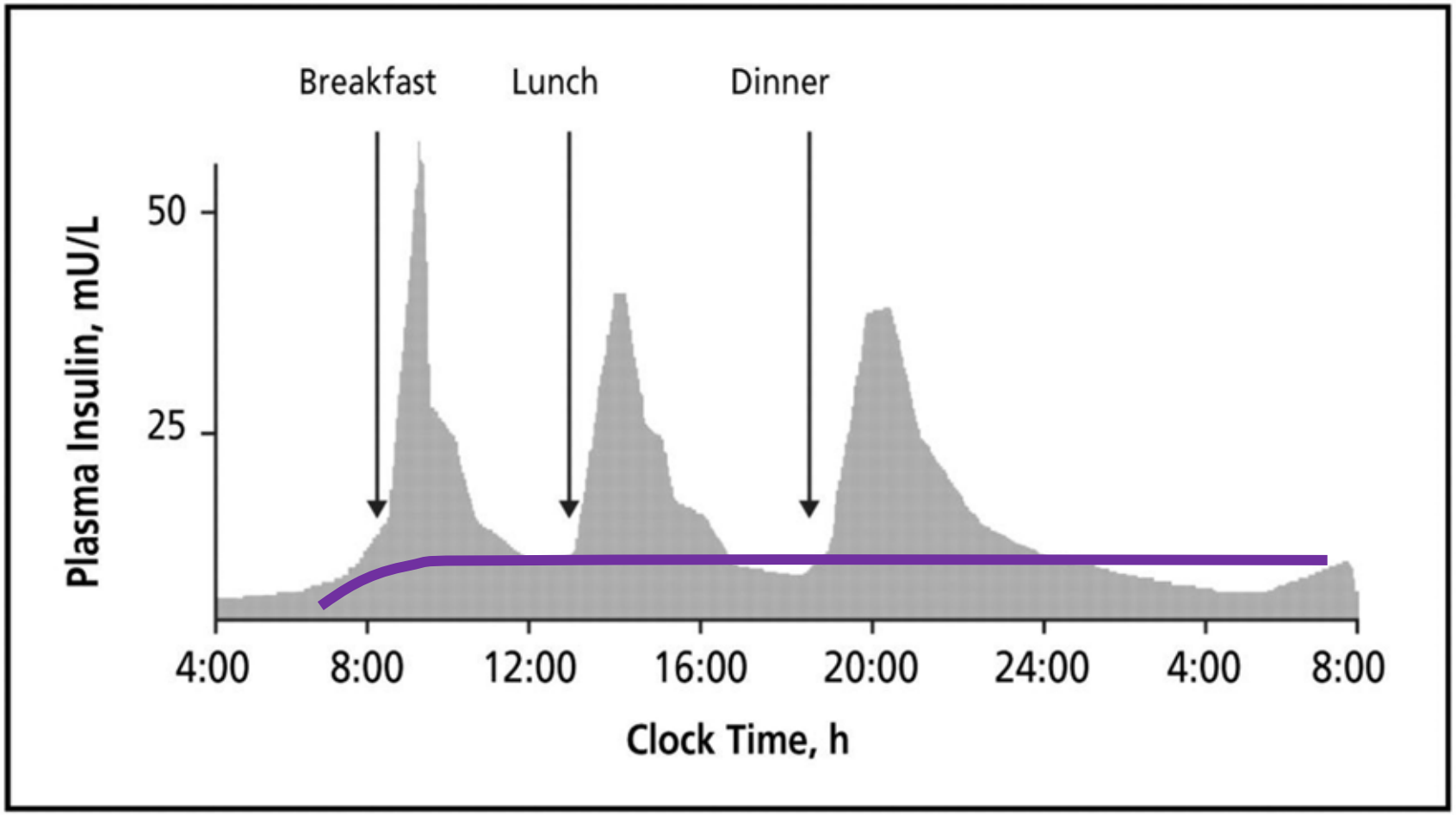
- Limits/prevent post-prandial hyperglycemia
- Physiologic two-phase release
  -First phase immediate and lasts 1-2 hours
  -Delayed slower to peak second phase
- Each meal about 10-20% of daily insulin needs

# Pre-Test | Question 2

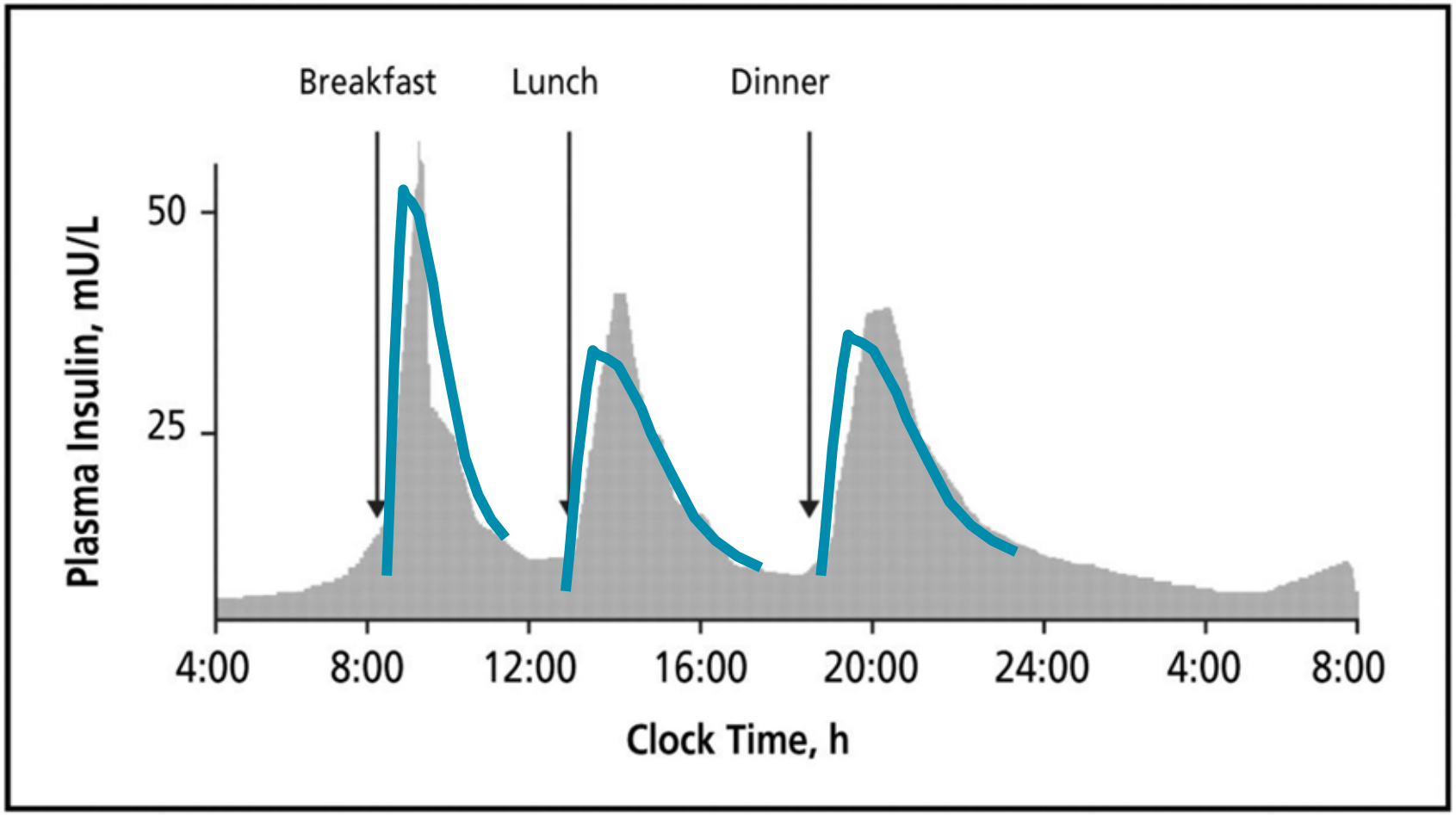
**Which of the following is a best practice in using basal insulin in type 2 diabetes?**

a) Start with 0.2/0.3 units per KG of body weight or 10 units once daily
b) Start 10 units per day in people with type 2 and 20 units per day in people with type 1
c) The maximum daily dose is 1.0 units per KG of body weight daily
d) Start with injections every other day if person is nervous about injections

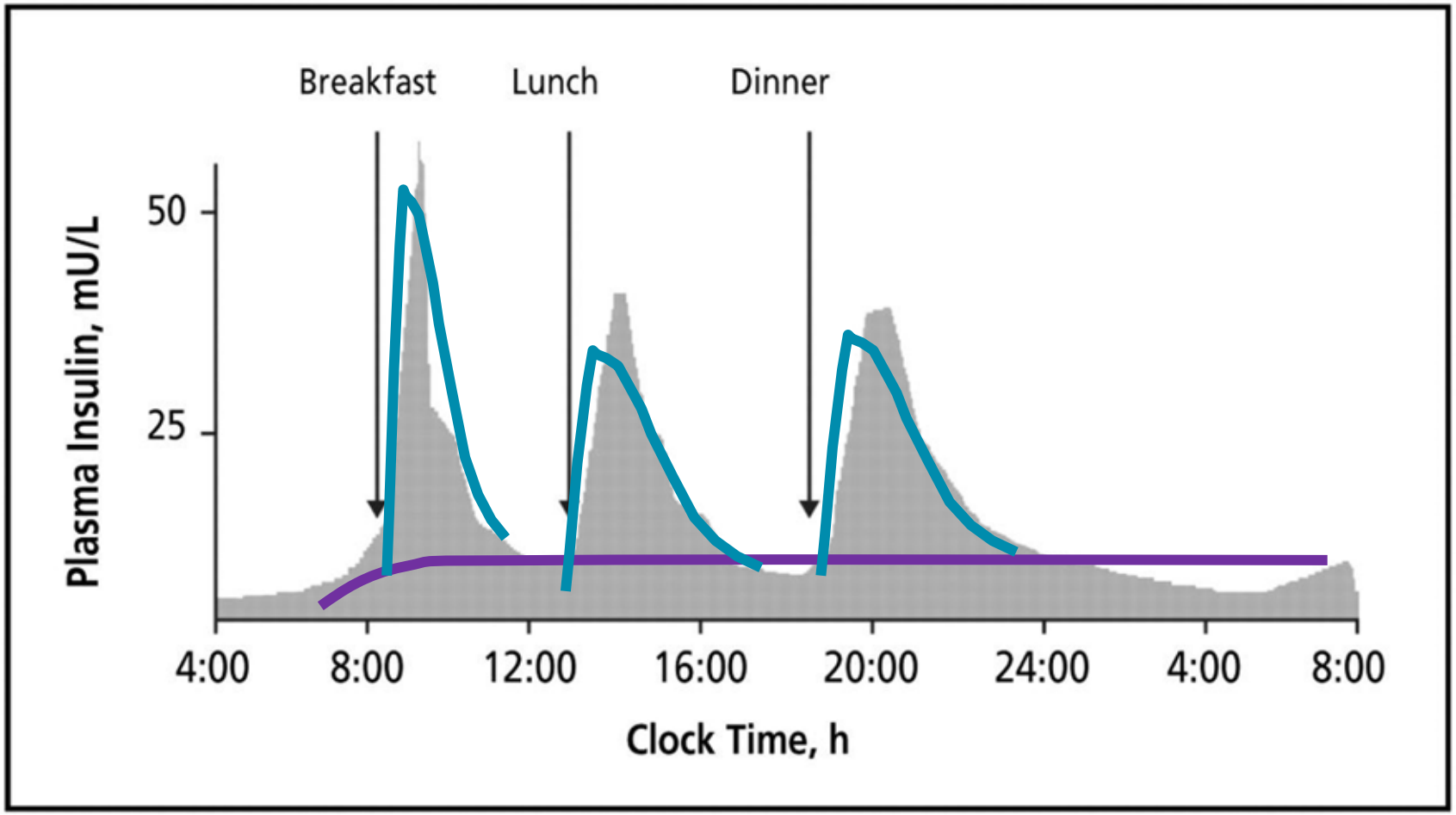
# Basal Insulin



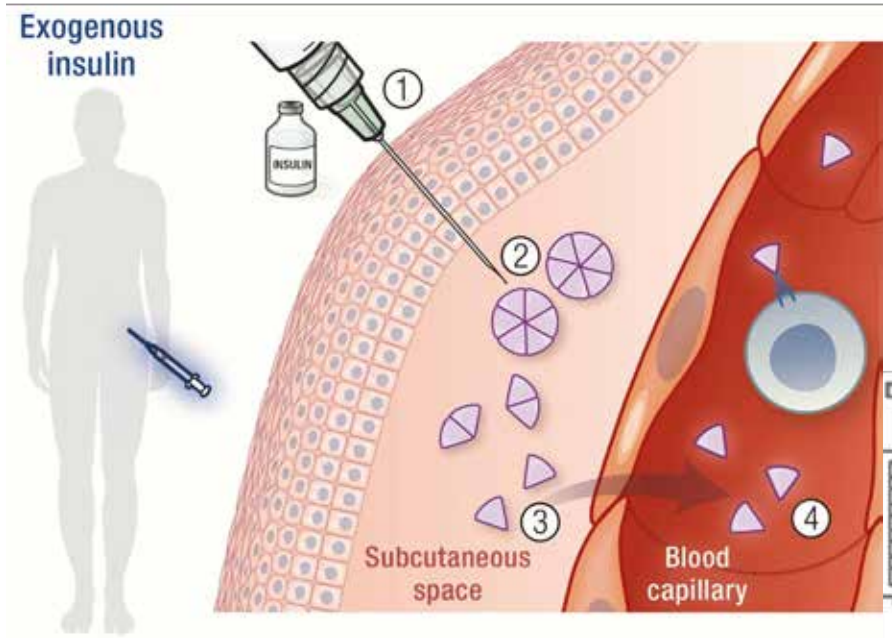
# Prandial Insulin

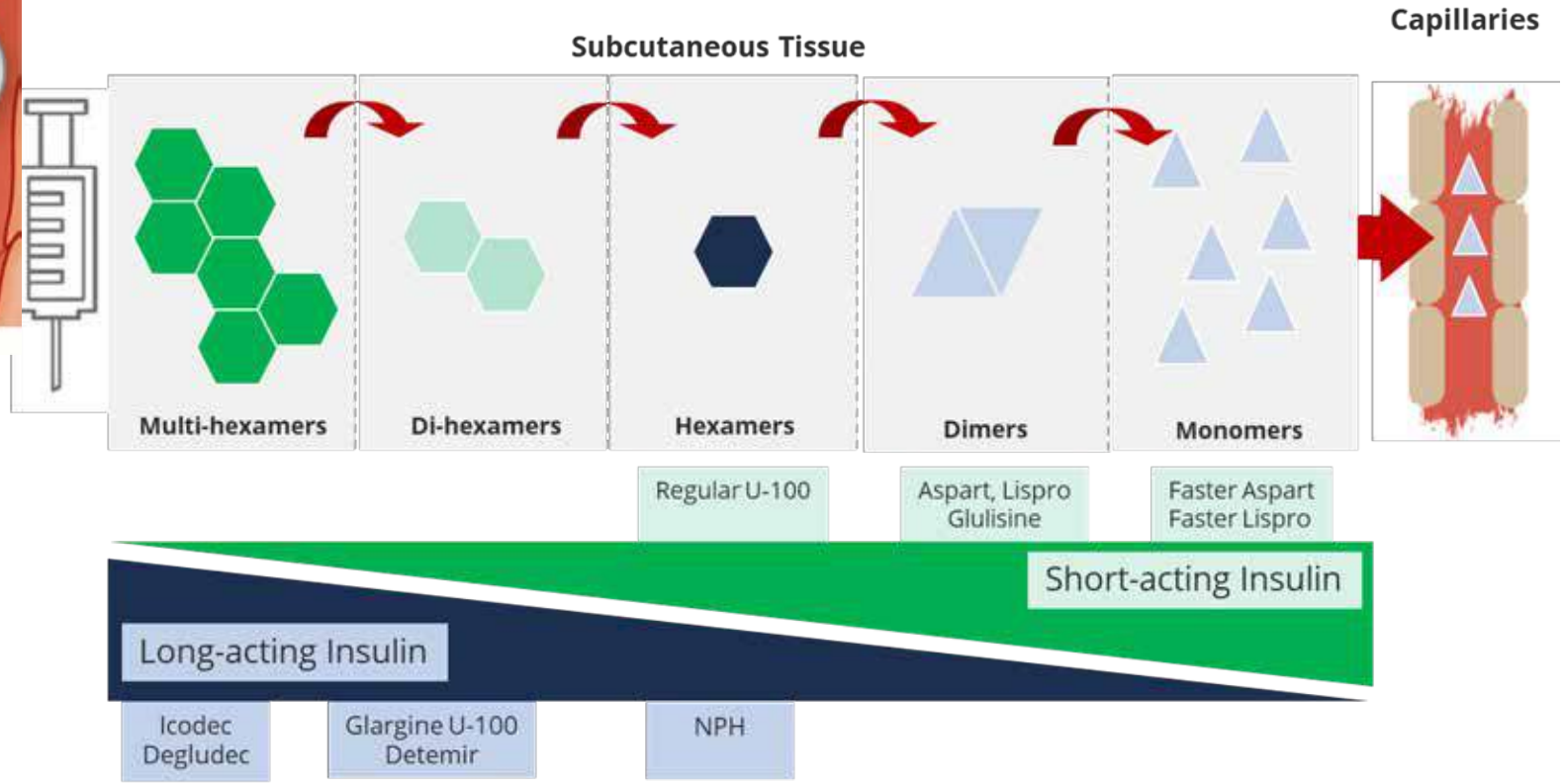


# Basal + Prandial (bolus) insulin

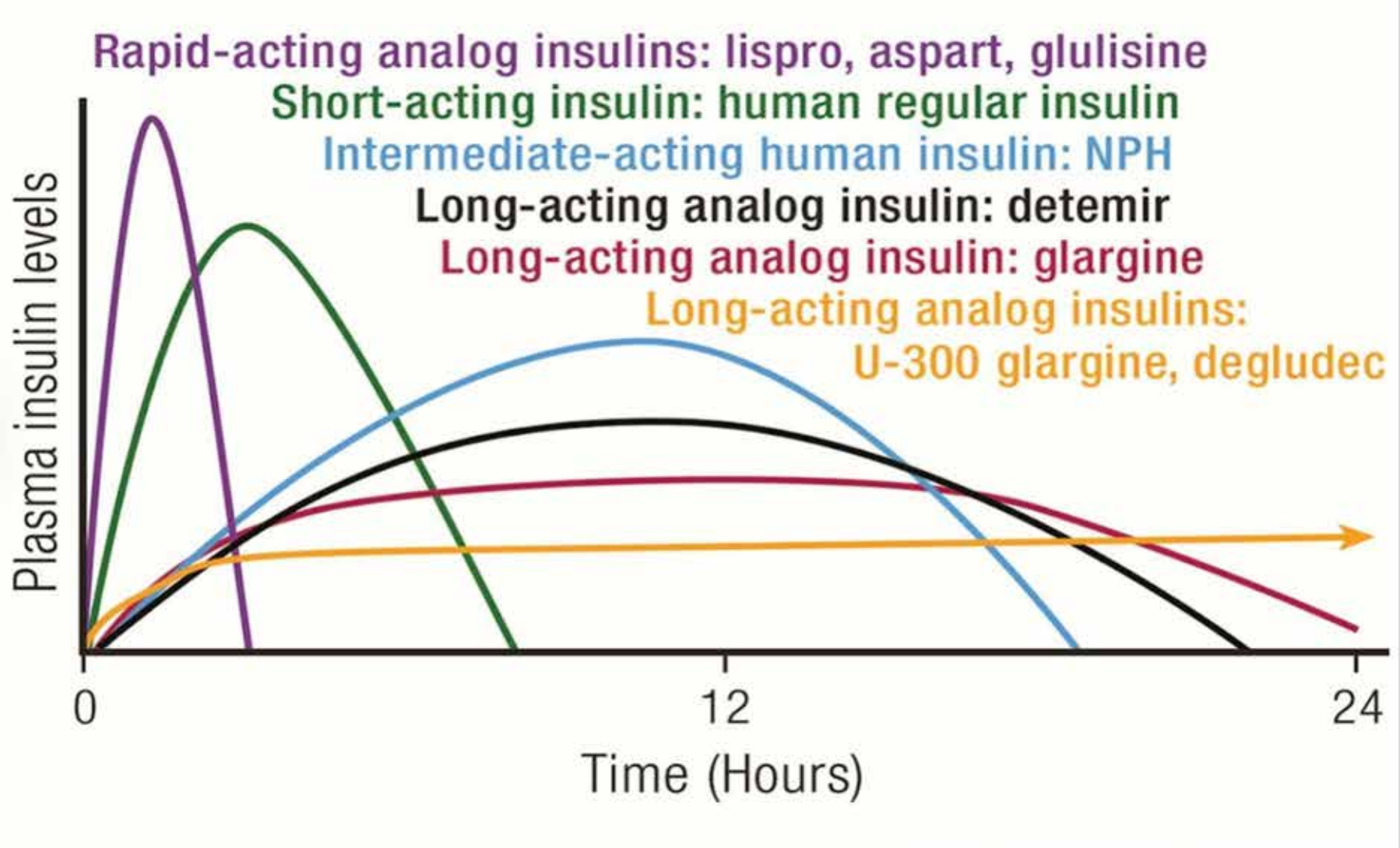


# Pharmacologic Modifications of Insulin



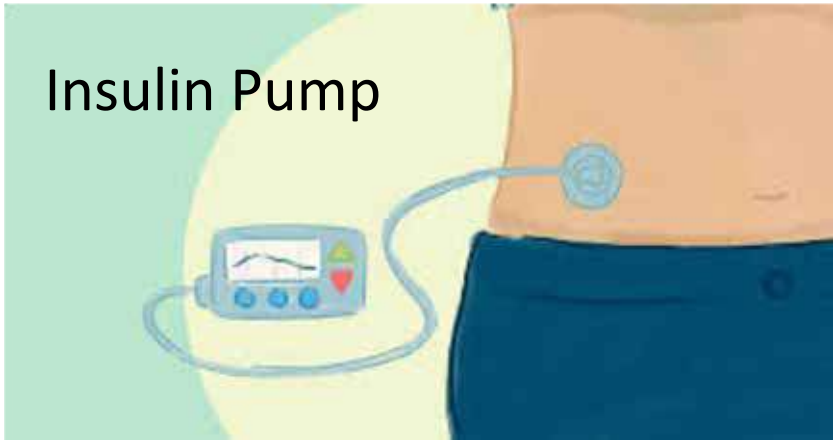
# Spectrum of Available Injectable Insulins



# Traditional Insulin Delivery Options

Syringes


Insulin Pens

# Spectrum of Basal Insulins

| | Branded Names | Onset | Peak | Duration | Notes |
|---|---|---|---|---|---|
| NPH | HumuLIN | 1-2 hours | 4-8 hours | 6-12 hours | Pens, Vials |
| | NovoLIN | | | | Pens, Vials |
| | ReliON | | | | Vials |
| Glargine (U100) | Lantus | 1-4 hours | No peak | 24 hours | Vials |
| | Basaglar | | | | Pens |
| | Semglee | | | | Pens Only |
| Detemir | Levemir | 1-4 hours | No peak | 20-23 hours | Vials |
| | | | | | Pens |
| Glargine U300 | Toujeo | 6 hours | No peak | 24 hours | Pens only |
| | Toujeo Max | | | | |
| Degludec U100, U200 | Tresiba | 1 hour | No peak | 42 hours | Pens only |

# Spectrum of Rapid and Regular insulin

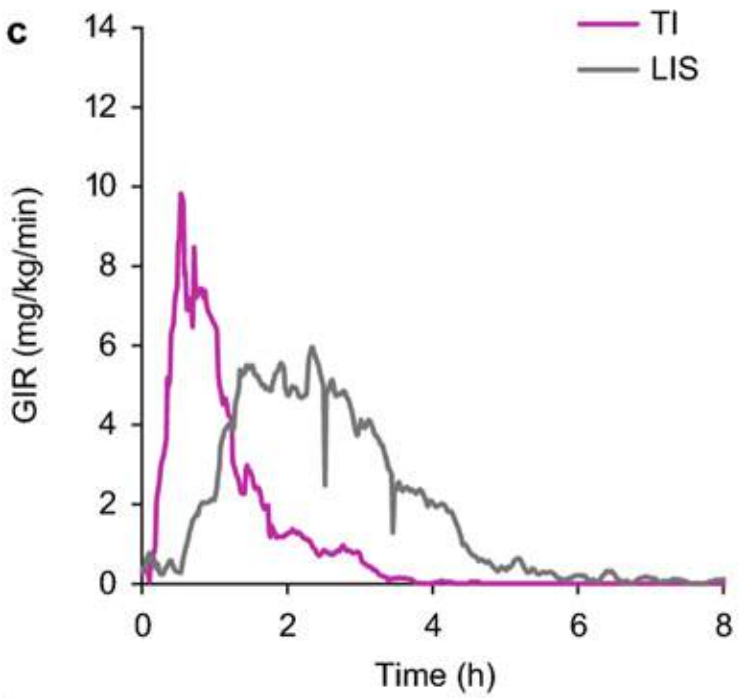
| | Branded Names | Onset | Peak | Duration | Notes |
|---|---|---|---|---|---|
| Regular (R) | HumuLIN | 30-45 minutes | 2-4 hours | 4-8 hours | Pens, Vials |
| | NovoLIN | | | | |
| | ReliON | | | | Vials Only |
| Aspart<br>Faster acting aspart | NovoLOG<br>FIASP | 15 minutes | 1-2 hours | 2-4 hours | Pens, Vials |
| Glulisine | Apidra | 15 minutes | 1-2 hours | 2-4 hours | Vials |
| Lispro | Humalog | 15 minutes | 1-2 hours | 2-4 hours | Pens, Vials |
| | Admelog | | | | |
| Lispro aabb | Lyumjev | | | | |

# Inhaled Insulin Technospheres

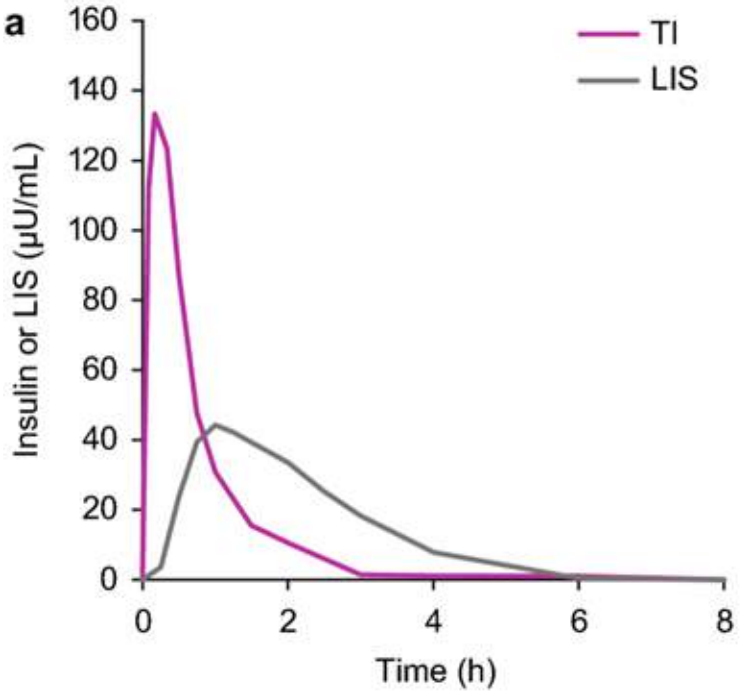

- Rapid acting inhaled human insulin indicated to improve glycemic control in adult patients with diabetes mellitus
- Not recommended to be used in patients who smoke or recently stopped smoking
- Contraindicated in chronic lung disease such as asthma or COPD
- Perform FEV1 spirometry before initiating, 6 months after therapy, and annually thereafter. Discontinue if greater than or equal to 20% decline in FEV1
- Administer at the beginning of the meal
  Doses available 4 units, 8 units, and 12 units

# PK/PD Compared to Insulin Lispro

## Pharmacodynamics




## Pharmacokinetics




Ref: https://link.springer.com/article/10.1007/s40262-021-01084-0/figures/5

# Ultra Rapid Acting Insulins

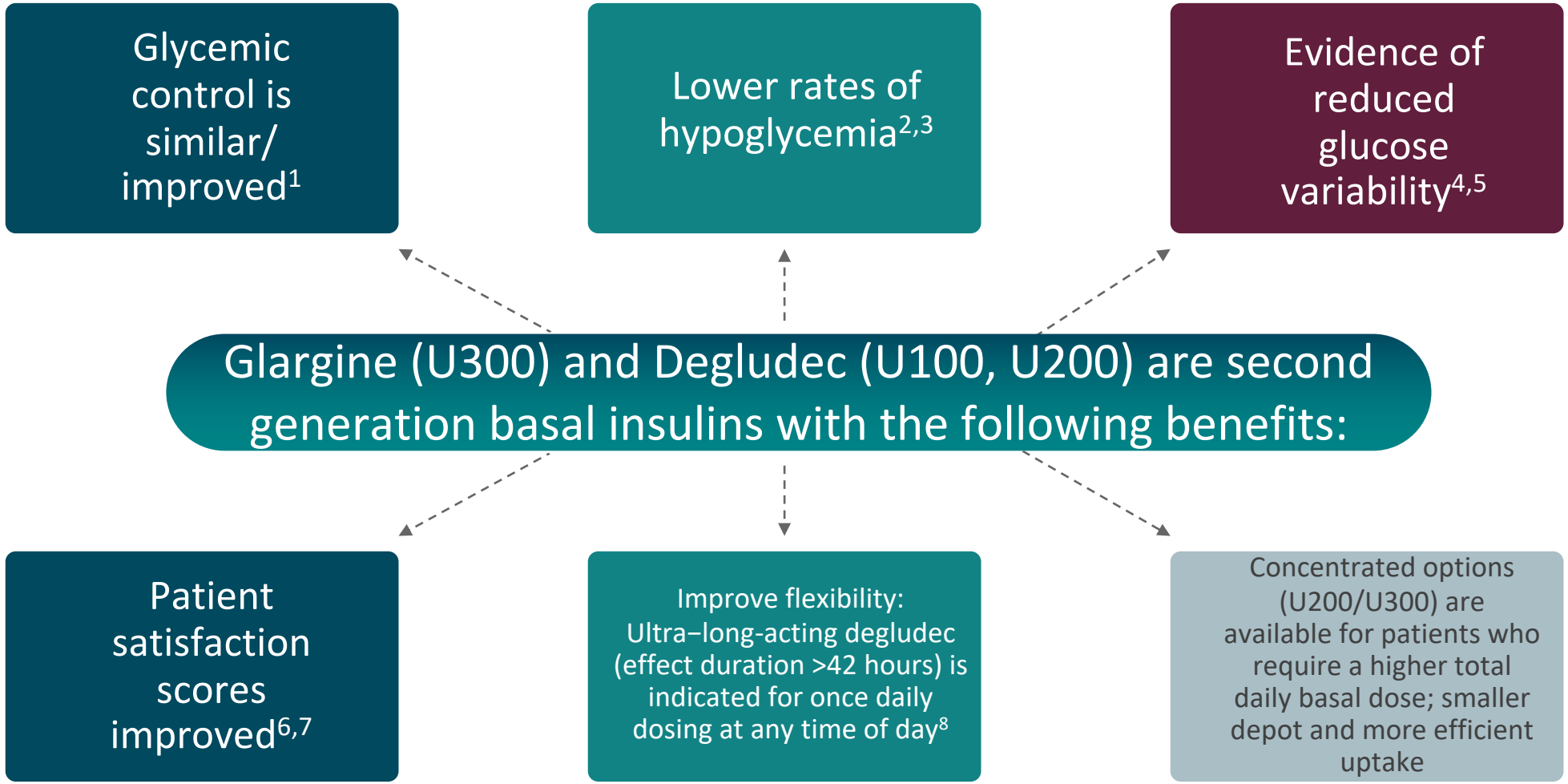
## Ultra-rapid insulins have been modified to:

- Better mimic physiologic insulin secretion
- Have a faster onset of action and shorter duration of effect
- Improve PPG control
- Reduce hypoglycemia

## Phase 3 clinical trials in both T1D and T2D showed that faster aspart and ultra-rapid lispro are associated with:

- A reduction of PPG excursions
- Similar or marginally superior A1c levels compared with those of first-generation rapid-acting insulin aspart and insulin lispro

# Ultra Long-acting Basal Insulins




Ref: 1. Aroda VR et al. Diabetes Obes Metab. 2016;18:663-670. 2. Wysham C et al. JAMA. 2017;318(1):45-56. 3. Sullivan SD, et al. Endocrinol Diab Metab. 2022;5:e00306. 4. Vora J, Heise T. Diabetes Obes Metab. 2013;15:701-712. 5. ADA. Diabetes Care. 2022;45(supp 1):S1-S264. 6. Zinman B et al. Diabetes Care. 2012;35:2464-2471. 7. Bolli GB, et al. Diabetes Obes Metab. 2017;43:351-358. 8. Meneghini L, et al. Diabetes Care. 2013;36:858-864

# Best Practices in Insulin Therapy

## Type 1 Diabetes

- Basal plus bolus regimens (MDI or CSII)
- Individualize treatment
  - -Carb ratio
  - -Individually calculated correction scale
  - -Meal time insulin BEFORE meals (default)

## Type 2 Diabetes

- Basal insulin first
- Basal plus 1 is as good as basal-bolus
- Keep basal insulin once daily
- Carb ratios often not needed

- Teach injections in person with first injection observed
- Always look and feel injection sites
- Regularly ask about hypoglycemia
- Technology helps insulin therapy
  - CGMs
  - Smart pens
  - Insulin pumps

# Basal Insulin: A Deeper Dive

Jay H. Shubrook, DO, FAAFP, FACOFP

# Pre-Test | Question 3

**Which of the following is a best practice in titrating basal insulin in type 2 diabetes?**

a. Make sure all insulin titrations occur at a face-to-face visit
b. Titrate daily 2-3 units daily
c. Stop titrating at 1.0 units per KG of body weight daily
d. Once you achieve the target glucose, you can start down-titrating

# Best Practices When Starting Insulin

- Do not use insulin as a weapon
- Utilize targeted glucose readings for insulin titration
- Insulin does not have to be a lifetime medication
- First injection in the office
- Start a weight-based dose of basal insulin
- If needed ask patients to demonstrate injections
- Provide patient with a titration plan
- Always look at injection sites

# What is Challenging Regarding Insulin Use

# Insulin Use Inertia

ADA recommends treatment intensification every 3-6 months if not at A1c goal

- Timely intensification and use of insulin if A1c is above 10%
- Most people would be on insulin between 1-2 years if not at goal
- Mean time to insulin was 4.3 years

Only 31% of eligible T2D patients had treatments intensified

(Khunti et al Diabetes, Obes, Metab)

Another study found that those who did not achieve target glucose at 3 months were less likely to achieve at 24 months.

(Maurico et al)

# Insulin: Action without Benefit

A systematic review of 218 randomized trials 39% of patients with type 2 diabetes treated with basal insulin achieved A1C <7.0%

(Esposito et al Diab, Obes, Metab)

A study of real-world data from a large United States electronic medical record database found that 38% of patients achieved A1C target <7% within 12 months of initiating basal insulin and only 8% more achieved target after 24 months

(Blonde et al, Diabetes Ther)

Disparities exist in access to insulin

- African-American (23%) & Latino American (34%) patients less likely to get insulin

(Pilla et al JGIM)

# Insulin in the Real World (What is the Barrier?)

Patient and Providers set individualized HbA1c target (DUNE study)

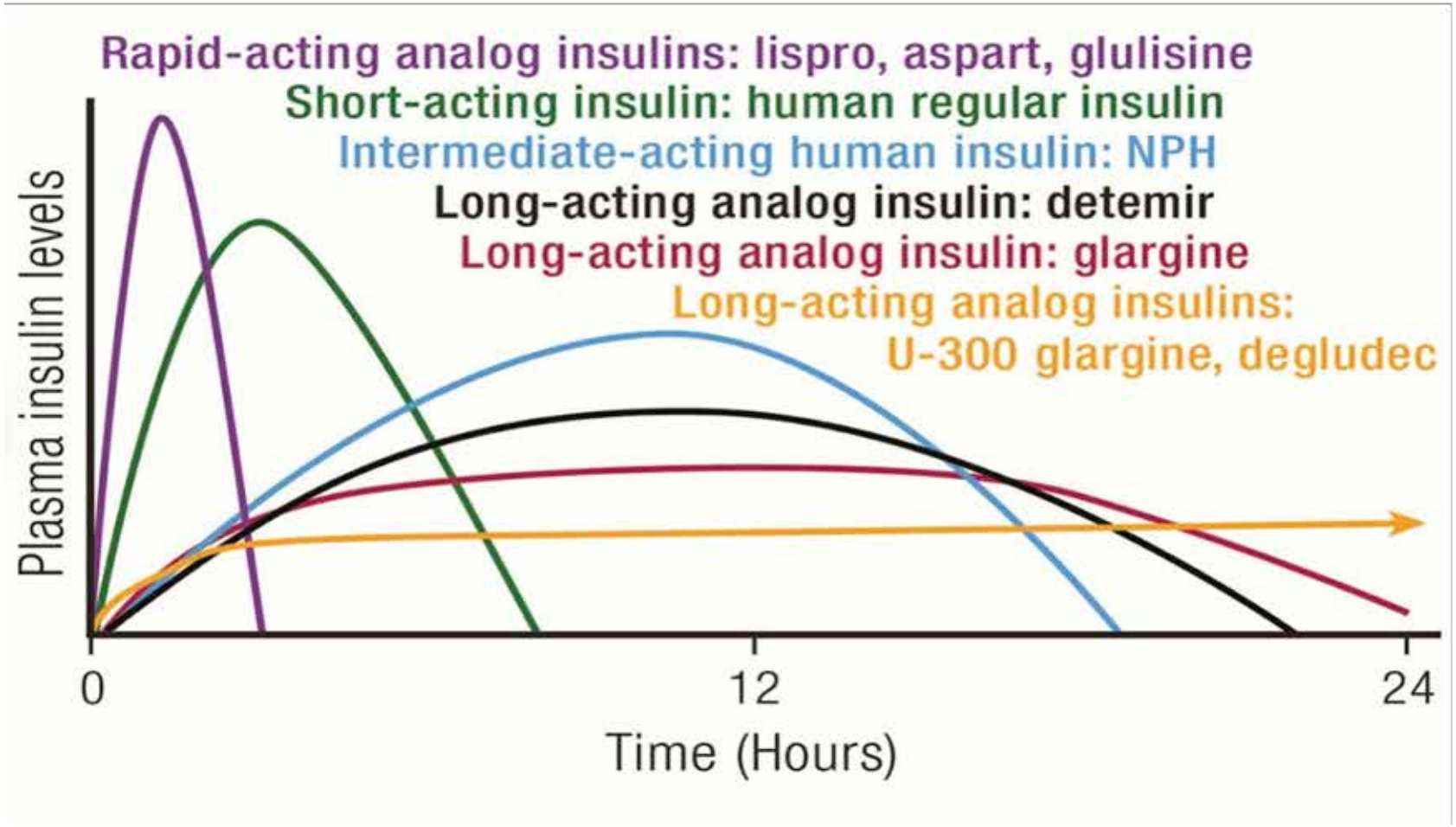
Patients started or titrated basal insulin
At week 12 only 27% achieved the agreed upon target

Insulin dose increased very little
-9 units in new users (from 14-23 units)
-5 units in continued users (23 -28 units)

Failure to titrate insulin results in patient not getting to goal and ultimately stopping the treatment

# When starting basal insulin, we have 3 months to achieve the goal!

# Basal Insulin



# Pre-Test | Question 4

**Which of the following is true regarding basal insulin dosing?**

a) A dose > 0.7 units/kg/day has diminishing returns and more hypoglycemia
b) Is titrated by looking at the post-prandial glucose data
c) Must be titrated by the healthcare clinician
d) Once started will be a lifetime medication

# Basal insulin Actions and Mechanisms

| | Branded Names | Onset | Peak | Duration | Notes |
|---|---|---|---|---|---|
| NPH | HumuLIN | 1-2 hours | 4-8 hours | 6-12 hours | Utilizes Zinc and protamination to extend duration |
| | NovoLIN | | | | |
| | ReliON | | | | |
| Glargine (U100) | Lantus | 1-4 hours | No peak | 24 hours | Acidic pH, AA substitution |
| | Basaglar | | | | |
| | Semglee | | | | |
| Detemir | Levemir | 1-4 hours | No peak | 20-23 hours | AA substitution<br>Binds to Albumin FFA |
| Glargine U300 | Toujeo | 6 hours | No peak | 24 hours | Acidic pH, AA substitution |
| | Toujeo Max | | | | |
| Degludec U100, U200 | Tresiba | 1 hour | No peak | 42 hours | AA substitution<br>Binds to Albumin FFA<br>Makes chains of hexamers |

# Best Practices When Starting Basal Insulin

## “Fix the fasting first”

- Shared decision-making A1c goal target
- Discuss the corresponding fasting glucose goal
- Focus on am glucose monitoring

## Use a weight-based dose

- 0.2-0.3 units/kg/day-starting dose (long-acting analog)
- 0.1 units/kg given before breakfast and dinner/bedtime if NPH
- Package insert states 10 units/day in type 2 diabetes

# Best Practices When Starting Basal Insulin

## Set the titration schedule with patient (any schedule will do)

- 1 unit/day increase
- 3 units increase twice weekly (ADA 2-4 units)
- 5-7 units increase weekly

## Set parameters when to stop titration

- Achieved am glucose goal
- Had a hypoglycemic episode
- Reached 0.5 units/kg/day (Ceiling dose)
- Always set the next appt to reassess

# Guidelines Regarding Insulin Basal Insulin Dosing/Titration

| Initiation Stage | ADA[1,2] | AACE[3] | |
|---|---|---|---|
| Initial Dose | 10 u/day<br>OR<br>0.1-0.2 u/kg/day | HbA1c <8%<br><br>0.1-0.2 u/kg/day | HbA1c >8%<br><br>0.2-0.3 u/kg/day |
| Titration | Set FPG goal | Goal: HbA1c <7%, FPG <110 mg/dL | |
| | Choose evidence-based algorithm to reach goal without hypoglycemia (eg, increase dose 2 units every 3 days; increase 1 unit per day; increase 5-7 units weekly) | Titration every 2-3 days | |
| | | Fixed regimen: increase dose by 2 units | |
| | | Adjustable regimen:<br>FPG >180 mg/dL: add 20% of TDD<br>FPG 140-180 mg/dL: add 10% of TDD<br>FPG 110-139 mg/dL: add 1 U | |
| | Hypoglycemia: reduce dose 10%-20% if no clear cause is evident | If hypoglycemia, reduce TDD by:<br>10%-20% if BG <70 mg/dL<br>20%-40% if BG <40 mg/dL | |

BG, blood glucose; FPG, fasting plasma glucose; TDD, total daily dose.

1. ADA. Diabetes Care. 2022;45(supp 1): S1-S264. 2. Shubrook JH, Pfotenhauer KM. Prim Care Clin Office Pract. 2022;49:301-313.
3. Garber AJ et al. Endocr Pract. 2020 Jan;26(1):107-139.

# Best Practices in Using Basal Insulin

## Be careful to not over-basalize

- 0.5 units/kg/day- good time to stop and “look up”
- Look at stability of the fasting glucose
- Look at bedtime to am change (BeAM)
- If stable move to meal-time glucose monitoring
- Basal insulin doses > 0.7 units/kg/day has diminishing returns and more hypoglycemia

(Meneghini et al, Reid et al)

**Once you achieve the fasting goal**

- Move glucose readings to pre and post meal (instead of fasting)
- Allows you to see about meal-time excursions

# Pre-Test | Question 5

**Which of the following is true regarding mealtime insulin in type 2 diabetes?**

a) Must be started at all three meals to be effective.
b) Start with one meal ( biggest/first), and 0.1 unit per kg of body weight
c) Should be taken 10-15 minutes after eating the meal
d) Must be injected in the abdomen

# What To Do After Basal Insulin

## If you are considering insulin

- Start with basal plus 1
- One mealtime insulin injection at a meal (first, biggest)
- Start with 0.1 unit/kg/dose

## Insulin disadvantages

- Costs
- Weight Gain
- Hypoglycemia

# What To Do After Basal Insulin

## If you are considering an injection, think GLP-1RA agonist first

- Better efficacy than mealtime insulin
- Less hypoglycemia
- Benefits of weight loss
- Non-glycemic benefits

## GLP-1 RA disadvantages

- COST
- Coverage
- Product warnings (pancreatitis, gastroparesis, MTC)

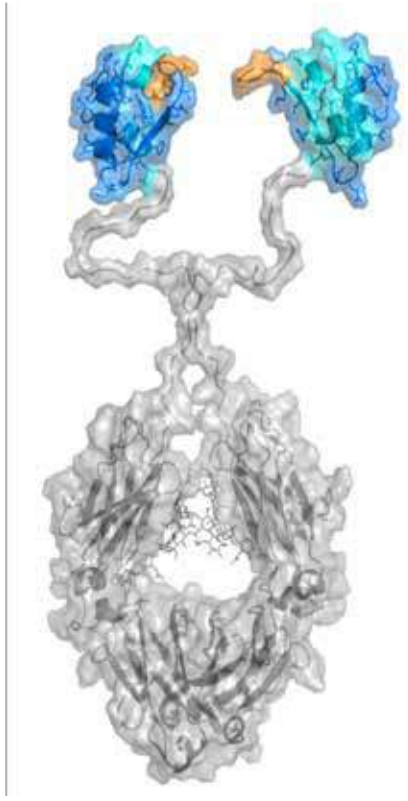
# The Future of Basal Insulin

# Pre-Test | Question 6

**Which of the following applies to the new once-weekly insulins in clinical trials?**

a) The once-weekly insulins have more hypoglycemia than the once-daily basal insulins
b) The once-weekly insulins have higher rates of hypoglycemia than once-daily basal insulins
c) The once-weekly insulins achieve lower A1c levels than once-daily basal insulins
d) The once-weekly insulins have similar A1c reductions, safety and hypoglycemia rates as the once-daily insulins

# Weekly Basal Insulin Candidate



Eli Lilly

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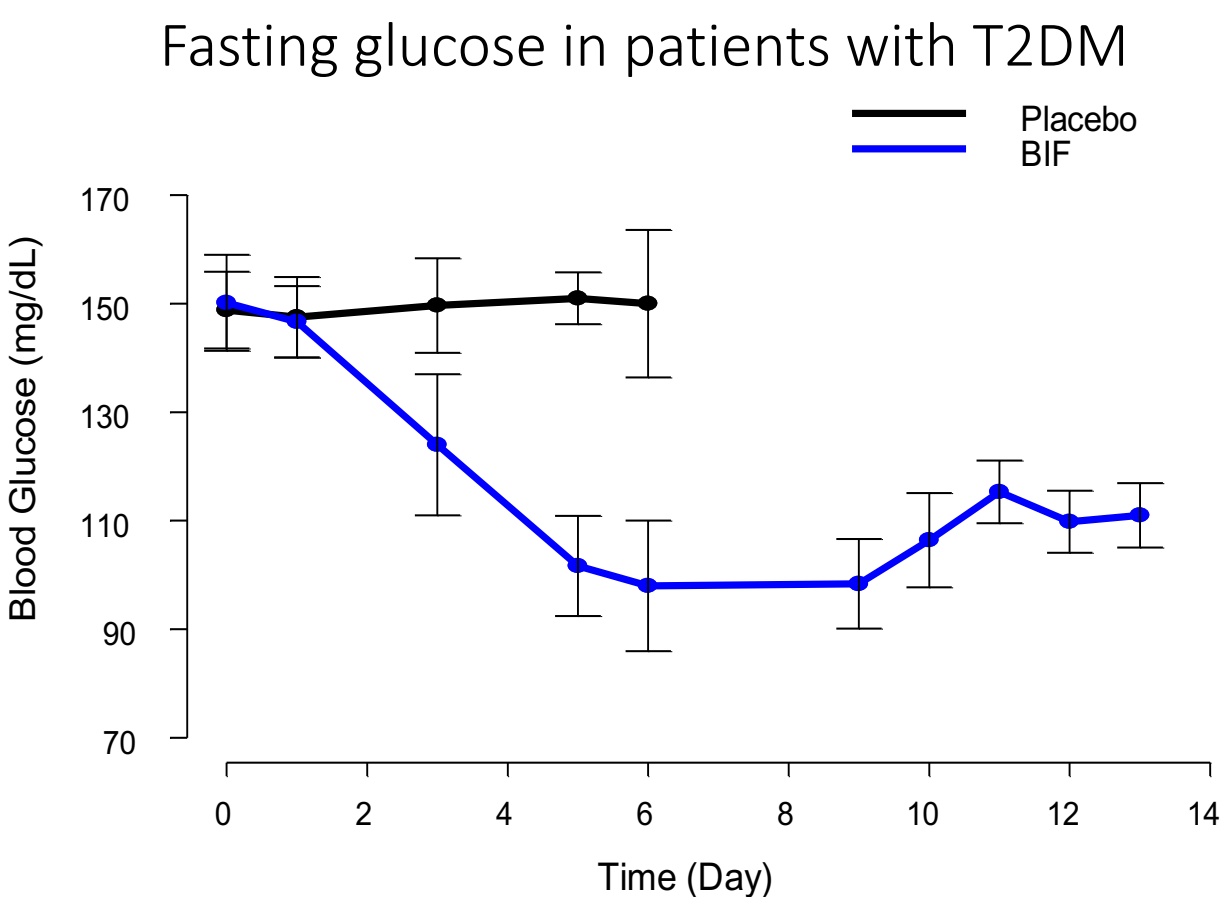
# Insulin BIF Glucose Efficacy




Prolonged glucose lowering for up to 10 days after a single dose of BIF

Glucose control comparable to conventional basal insulins

Low incidence of hypoglycemia with multiple doses

- No severe hypoglycemia
- All hypoglycemic episodes recovered spontaneously or with oral carbohydrate
- Profile similar to insulin glargine

No clinically significant injection site reactions

Very low rate of anti-drug antibodies

Abbreviations: BIF, weekly basal insulin Fc; T2DM, type 2 diabetes mellitus.

Courtesy of Stefano Del Prato, MD | University of Pisa, Pisa, Italy | ADA 2020 Scientific Sessions

# Summary – Insulin BIF

Novel once weekly insulin receptor agonist utilizing well-established Fc platform

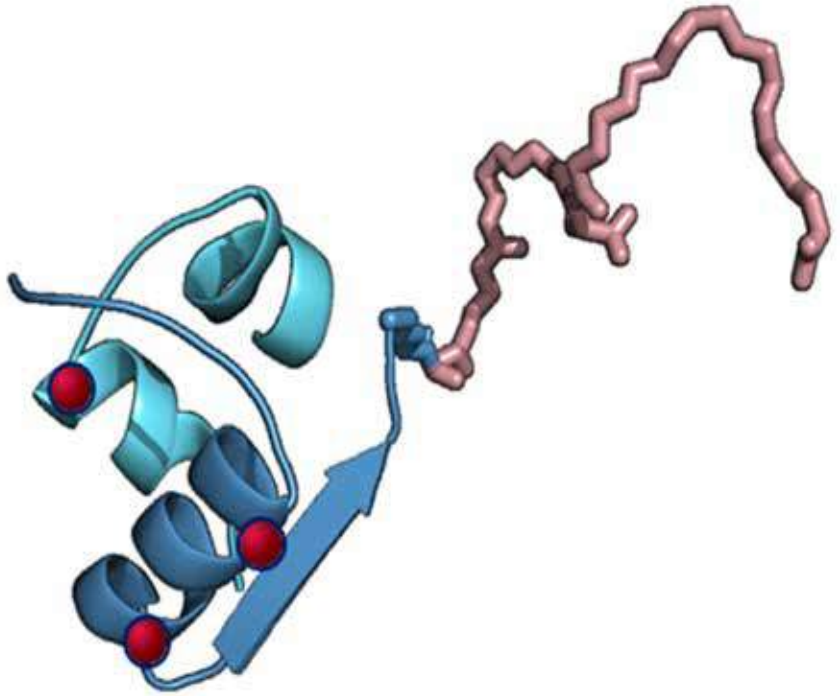
- Potent glucose lowering
- Safety profile comparable to conventional insulins
  - No safety or tolerability findings to preclude from moving to next stage of development
  - Low mitogenicity potential
  - Low immunogenicity potential, very low rate of anti-drug antibodies
  - Most hypoglycemic episodes recovered spontaneously or with oral carbohydrate
- Potential to decrease number of hypoglycemic events beyond conventional insulins due to low peak-to-trough ratio

A large phase 2 program exploring the efficacy and safety of BIF in a broad patient population, including T1DM, is being conducted.

Abbreviations: BIF, weekly basal insulin Fc; T2DM, type 2 diabetes mellitus.

Courtesy of Stefano Del Prato, MD | University of Pisa, Pisa, Italy | ADA 2020 Scientific Sessions

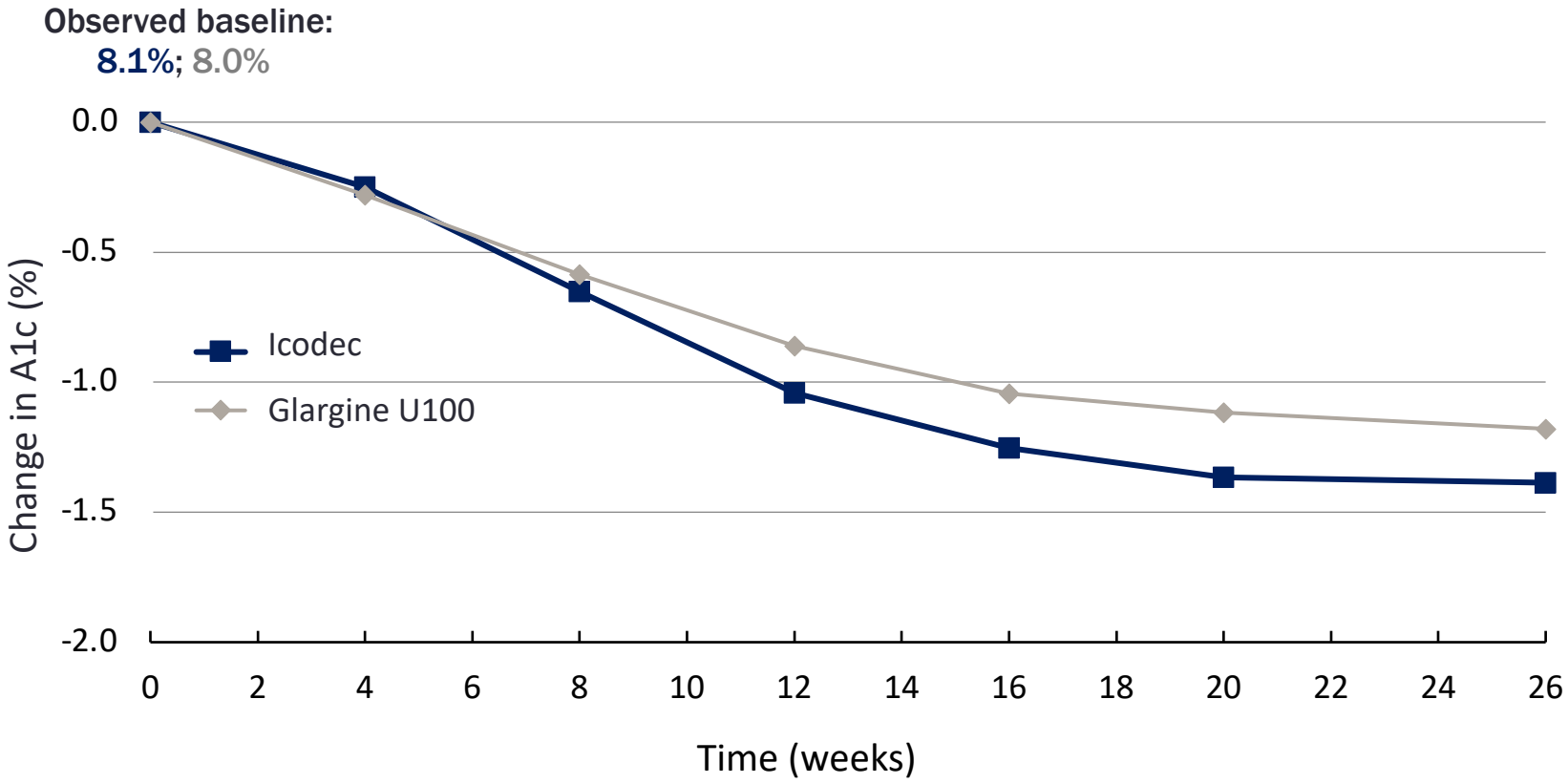
# Weekly Basal Insulin Candidate



Novo Nordisk

Courtesy of Stefano Del Prato, MD | University of Pisa, Pisa, Italy | ADA 2020 Scientific Sessions

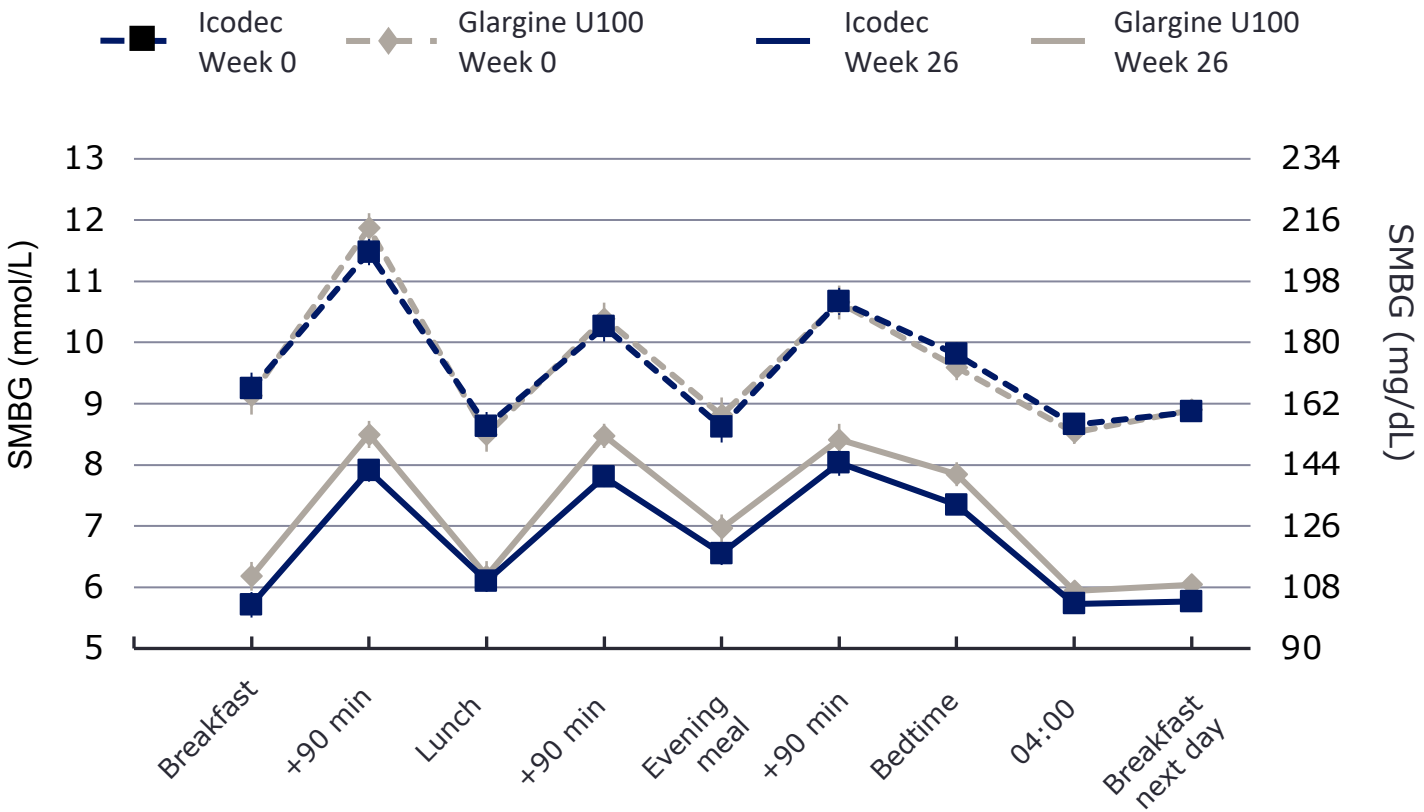
# Weekly Insulin Icodec: A1C Changes Over Time




| Supportive Statistical Analysis | |
|---|---|
| Estimated mean A1C at week 26 | |
| 6.9% | 6.7% |
| Estimated mean change from baseline to week 26 in A1C | |
| -1.15% | -1.33% |
| ETD (Icodec – Glargine U100): -0.18% [95%CI 0.38; 0.02] p= 0.08 | |

Full analysis set. Observed data are mean (symbol) ± SEM (error bars) on-treatment without ancillary treatment.
Estimated mean change values and ETD with 95% CI at week 26 derived based on MMRM (trial product estimand).
A1C, glycated hemoglobin; CI, confidence interval; ETD, estimated treatment difference; MMRM, mixed model for repeated measures; SEM, standard error of the mean.
Courtesy of Stefano Del Prato, MD | University of Pisa, Pisa, Italy | ADA 2020 Scientific Sessions | Rosenstock J et al ADA Scientific Sessions 2020

# Weekly Insulin Icodec: 9-point SMBG Profile




| Supportive Statistical Analysis |
| --- |
| Estimated mean change from baseline to week 26 in mean of 9-point SMBG profile |
| ETD (Icodec – Glargine U100): -7.9 mg/dL [95%CI-14.1; -1.6] p= 0.01 |

Full analysis set. Observed data are mean (symbol) ± SEM (error bars) on-treatment without ancillary treatment.
Estimated mean change values and ETD with 95% CI at week 26 derived based on MMRM (trial product estimand).
A1C, glycated hemoglobin; CI, confidence interval; ETD, estimated treatment difference; MMRM, mixed model for repeated measures; SEM, standard error of the mean.
Courtesy of Stefano Del Prato, MD | University of Pisa, Pisa, Italy | ADA 2020 Scientific Sessions | Rosenstock J et al ADA Scientific Sessions 2020

# Hypoglycemia During the On-Treatment Period Weekly Insulin Icodec

| Hypoglycemia Levels | Icodec (N = 125) | | Glargine U100 (N = 122) | |
|---|---|---|---|---|
| | N (%) | E (R) | N (%) | E (R) |
| Hypoglycemia Alert Value (Level 1) | 67 (53.6) | 368 (508.9) | 46 (37.7) | 148 (210.8) |
| Severe (Level 3) or Clinically Significant (Level 2) Hypoglycemia | 20 (16.0) | 38 (52.5) | 12 (9.8) | 32 (45.6) |
| Severe Hypoglycemia (Level 3) | 1 (0.8) | 1 (1.4) | 0 | |

The duration of hypoglycaemia was not longer with Icodec compared to Glargine U100

On-treatment: onset date on or after the first dose of trial product and no later than the first date of either the last follow-up visit (FU2), the last date on trial product + 5 weeks for once-daily insulin and + 6 weeks for once-weekly insulin or the end-date for the in-trial period.
%, percentage of patients with one or more events; E, number of events; N, number of patients with one or more events; R, rate (number of events divided by patient years of exposure multiplied by 100).
Courtesy of Stefano Del Prato, MD | University of Pisa, Pisa, Italy | ADA 2020 Scientific Sessions

# Weekly Insulin Icodec vs Daily Insulin Glargine U100 in Insulin Naïve Patients with T2DM: Summary

Once-weekly insulin Icodec displayed similar glucose-lowering effect and safety profile to once-daily insulin Glargine U100

- No significant differences between treatments in change from baseline in A1C, FPG, or body weight
- Improved mean of the 9-point SMBG profile with insulin Icodec compared with insulin Glargine U100
- Rates of severe (level 3) or clinically significant (level 2) hypoglycemia were low for both insulin treatments
  - No statistically significant differences during the on-treatment period
- No new safety issues were identified in relation to insulin Icodec in this trial

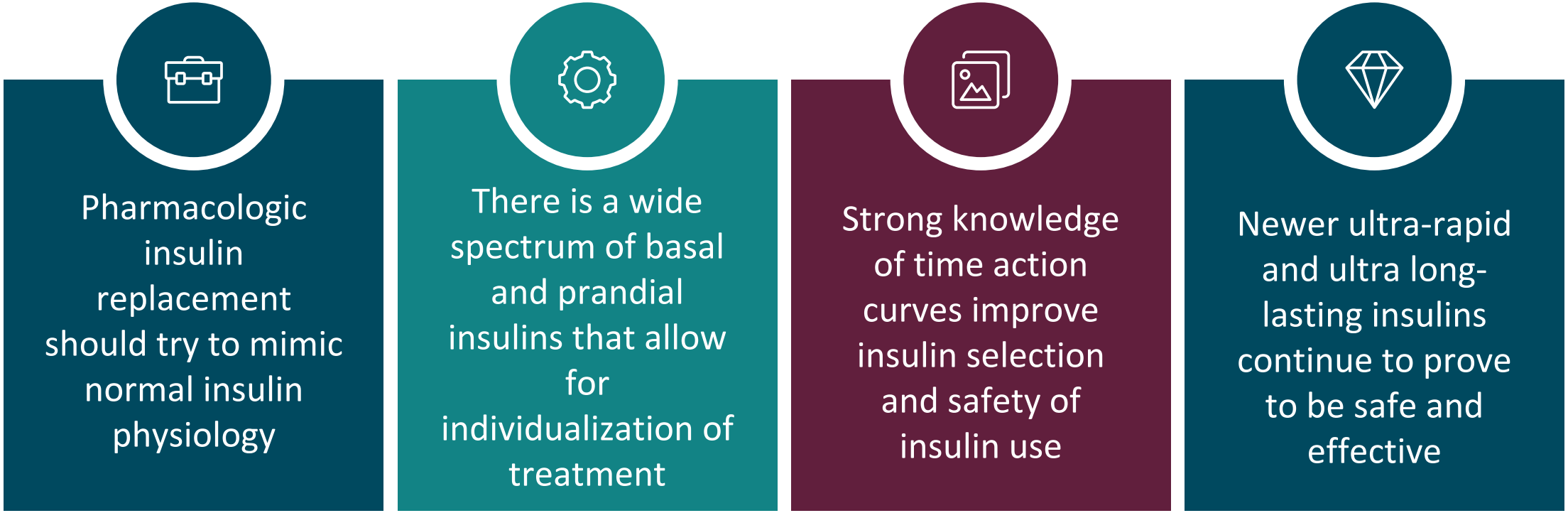
A1C, glycated hemoglobin; FPG, fasting plasma glucose; SMBG, self-measured blood glucose

Courtesy of Stefano Del Prato, MD | University of Pisa, Pisa, Italy | ADA 2020 Scientific Sessions

# Once Weekly Insulins

1. Once-weekly insulins will facilitate insulin replacement therapy
2. Once-weekly dosing has the potential to reduce therapeutic inertia, and improve persistence, as has been seen with GLP-1 RAs
3. New implementation strategies (eg, initiation, titration, switching, intensification) will be needed
4. Understanding the risk and management of hypoglycemic events will be important
5. Clinician and patient education will be crucial
6. Offer the potential of a once-weekly insulin/GLP-1RA combination

# Summary


Pharmacologic insulin replacement should try to mimic normal insulin physiology
There is a wide spectrum of basal and prandial insulins that allow for individualization of treatment
Strong knowledge of time action curves improve insulin selection and safety of insulin use
Newer ultra-rapid and ultra long-lasting insulins continue to prove to be safe and effective

# Role of CGM in Insulin Therapy & Minimizing Hypoglycemia with Insulins

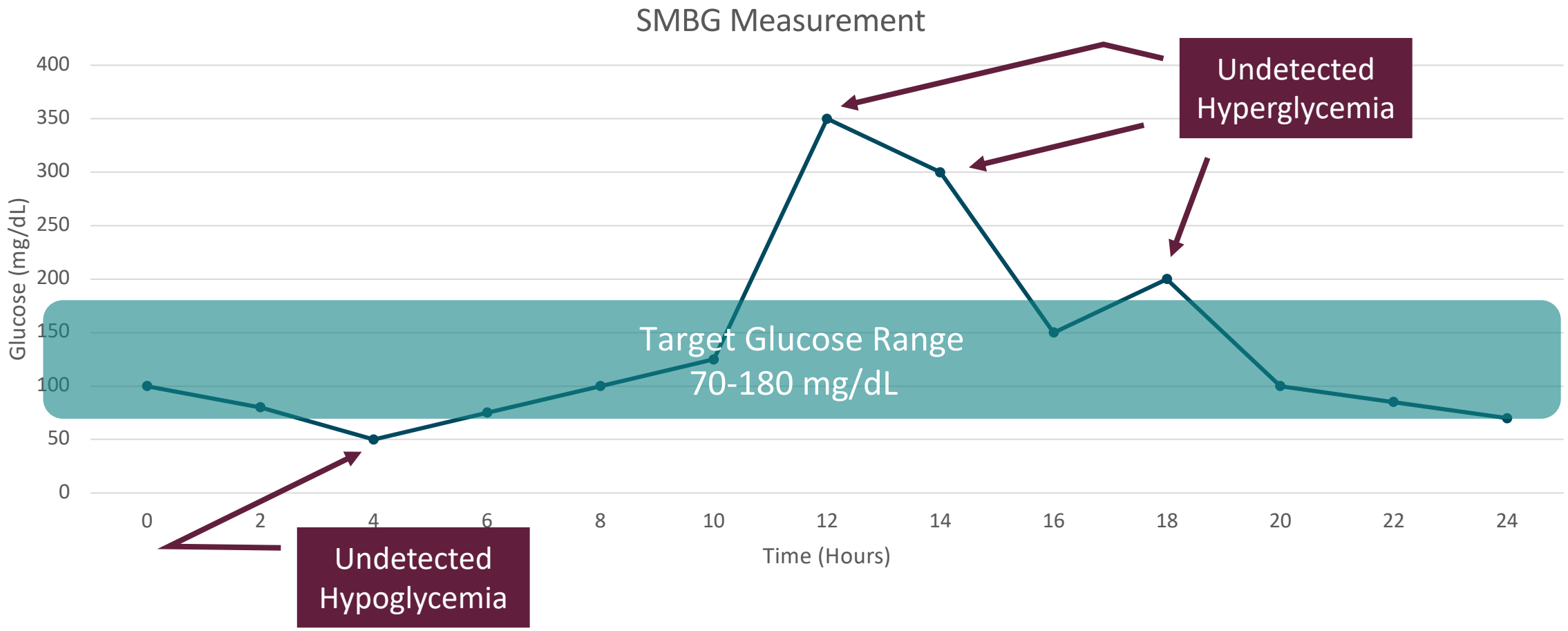
DAVIDA F. KRUGER, MSN, APN-BC, BC-ADM

# Pre-Test | Question 7

**Which of the following statements below is TRUE regarding Continuous Glucose Monitoring?**

a) It is not covered by Medicare for people on insulin
b) It is not able to accurately identify hypoglycemia
c) It identifies glycemic patterns that are often missed by finger-stick data
d) It is widely accepted by all insurance for all people with diabetes

# Glycemic Patterns Are Often Missed by SMBG but Detected With CGM



# Real-Time CGM & Intermittently Scanned CGM

## Real-Time CGM (rtCGM)

CGM systems that measure and display blood glucose continuously every 1 to 5 minutes

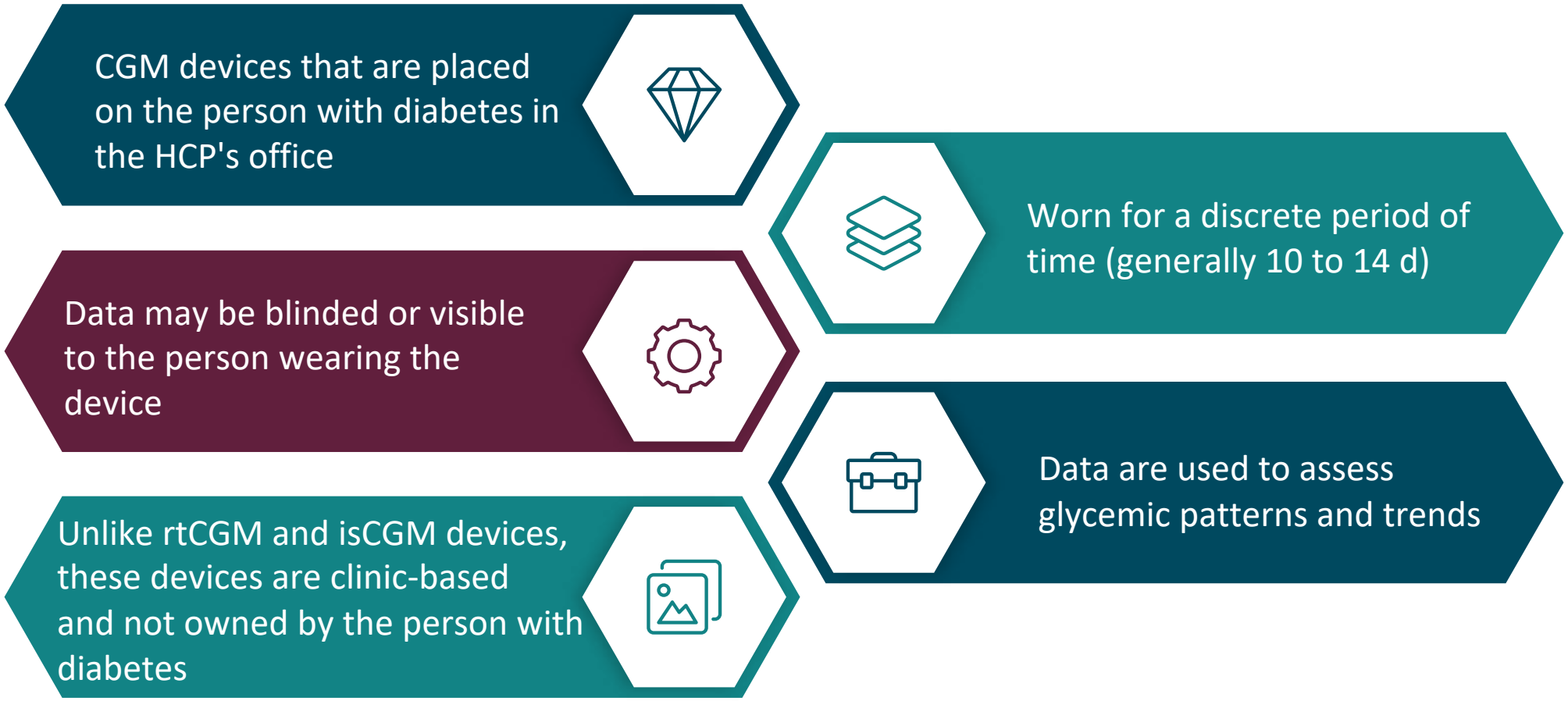
rtCGM, real-time continuous glucose monitoring.
ElSayed NA, et al. Diabetes Care. 2023;46(suppl):S111-S127.

## Intermittently Scanned CGM (isCGM) with and without alarms

CGM systems that measure glucose levels continuously but require scanning for visualization and storage of glucose values

isCGM, intermittently scanned continuous glucose monitoring.
ElSayed NA, et al. Diabetes Care. 2023;46(suppl):S111-S127.

# Professional CGM




HCP, healthcare provider.

ElSayed NA, et al. Diabetes Care. 2023;46(suppl):S111-S127.

# Professional CGM Devices

| | FreeStyle Libre Pro | G6 Pro |
|---|---|---|
| Data type | Blinded | Blinded or unblinded |
| Frequency of glucose readings | Records glucose every 15 min | Glucose readings sent to patient's smart device every 5 min in unblinded mode; data also sent to HCP<br>Sensor/transmitter returned after 10 days and CGM data uploaded for HCP and patient |
| Approved ages | ≥ 18 y | ≥ 2 y |
| Location for placement | Back of upper arm | Abdomen<br>(also buttocks for patients 2 to 17 y) |
| Sensor life | 14 d | 10 d |
| Calibration | No | No |
| Warm-up time | 1 h | 2 h |
| Potential interfering agents | Ascorbic acid<br>Salicylic acid | Hydroxyurea<br>High-dose acetaminophen<br>(> 1 g every 6 h in adults) |
| Alerts or alarms | No | Yes (unblinded) |

# Personal CGM Devices

| | FreeStyle Libre<br>14-Day isCGM/ 2 isCGM/ 3 rtCGM | G6 / G7 rtCGM | Guardian Sensor 3 & 4 (pump integrated) and Guardian Connect (stand-alone) rtCGM | Eversense<br>90-Day/ E3 rtCGM |
|---|---|---|---|---|
| Approved labeling | Replaces fingersticks for treatment decisions; no fingerstick calibration required | Replaces fingersticks for treatment decisions; no fingerstick calibration required | 4: Replaces fingersticks for treatment decisions; no fingerstick calibration required<br>3: Requires ≥ 2 fingerstick calibrations/d | Replaces fingersticks for treatment decisions; requires ≥ 2 fingerstick calibrations/d |
| Age | ≥ 18 y / ≥ 4 y / ≥ 4 y<br>2 / 3: Use during pregnancy by women with T1D, T2D, or GDM | ≥ 2 y<br>G 7: Use during pregnancy by women with T1D, T2D, or GDM | Guardian 4: ≥ 7 y<br>Guardian 3: ≥ 14 y<br>Connect: ≥ 14 y | ≥ 18 y |
| Medicare coverage | Yes / Yes / yes | Yes / Yes | Sensor 3: Yes / 780 G: Yes / Connect: No | Yes |
| Wear length | 14 d / up to 15 d / up to 15 d | 10 d / 10 d + 12 h | 7 d | 90 d / 180 d |
| Warm-up | 1 h | 2 h / up to 30 min | 2 h | 24 h after implementation |
| Alarms | No / Yes / Yes | Yes | Yes | Yes |
| Data display/integration | 14 / 2/3: Reader; Android and iOS Apps<br>2 / 3: CGM for integration with AID systems | Receiver; Android and iOS Apps; smartwatches<br>t:slim X2 pump, Omnipod 5 | Connect: Android and iOS Apps<br>Guardian 3: 630G, 670G, 770G<br>Guardian 4: 780G | Android and iOS Apps, smartwatches |
| Form | Disposable transmitter integrated with sensor patch | G6: Transmitter (3-mo use) separate from sensor/G7 integrated | Transmitter (rechargeable every 6 days) separate from sensor | Transmitter (lasts 1 year, charge daily) separate from sensor |
| Accuracy* | 11.4% / 9.3% / 7.9% | 9.0% / 8.2% | 9.6% / 9.0% to 11% | 8.5% to 9.5% |

*Accuracy measured by MARD (mean absolute relative difference) relative to venous glucose. Lower numbers are more accurate. Accuracy figures and specifications for each device provided by manufacturers. AID, automated insulin delivery; FDA, US Food and Drug Administration; GDM, gestational diabetes mellitus; T1D, type 1 diabetes; T2D, type 2 diabetes.

# FreeStyle Libre Phone App and Desktop

## FreeStyle Libre 14-day sensor, LibreLink for loved ones, and LibreView for download reports

## Libre 10-day and 14-day Libre 2/3 sensor, LibreView for download reports

# G6/G7 Phone App and Desktop

## G6/G7 10-day sensor

## Share for loved ones and Clarity for download reports



# Guardian Phone App and Desktop

## Guardian System with Connect for loved ones and CareLink™ software for downloading reports


# Eversense Phone App


## Mobile App for iOS and Android

# Educating Your Patients About Technology

**Educate Patient**

- Blood glucose values are changing constantly
- A fingerstick is only a snapshot of a 24-hour period
- CGM provides continuous information to help us with decisions (eg, show them an example of the AGP and discuss TIR)

**Explain** how the CGM download or AGP helps us recognize hyper- and hypoglycemia patterns

- Allows us to discuss medication and lifestyle choices and develop a treatment plan using a shared decision-making approach
- "Opens up the conversation"

**Explain** that CGMs are beneficial if patients are having a difficult time reaching or maintaining their glycemic target or HbA1c

Helps them understand how certain foods or activities affect their personal glucose journey

**Show** patients the CGM options available on the market, and explain how they differ. Give them choice, and empower them to make the right decision for themselves personally

**Discuss** hypoglycemia anxiety, and how it affects them and their family members personally. Discuss how it can prevent us from improving HbA1c levels and glycemic control

AGP, ambulatory glucose profile; TIR, time in range.

# Clinical Practice Guidelines on CGM Use in Adults

## AACE Clinical Practice Guidelines 2022[a]

CGM is recommended for persons with T2D who are treated with insulin therapy, or who have high risk of hypoglycemia and/or with hypoglycemia unawareness **(Grade A*)**

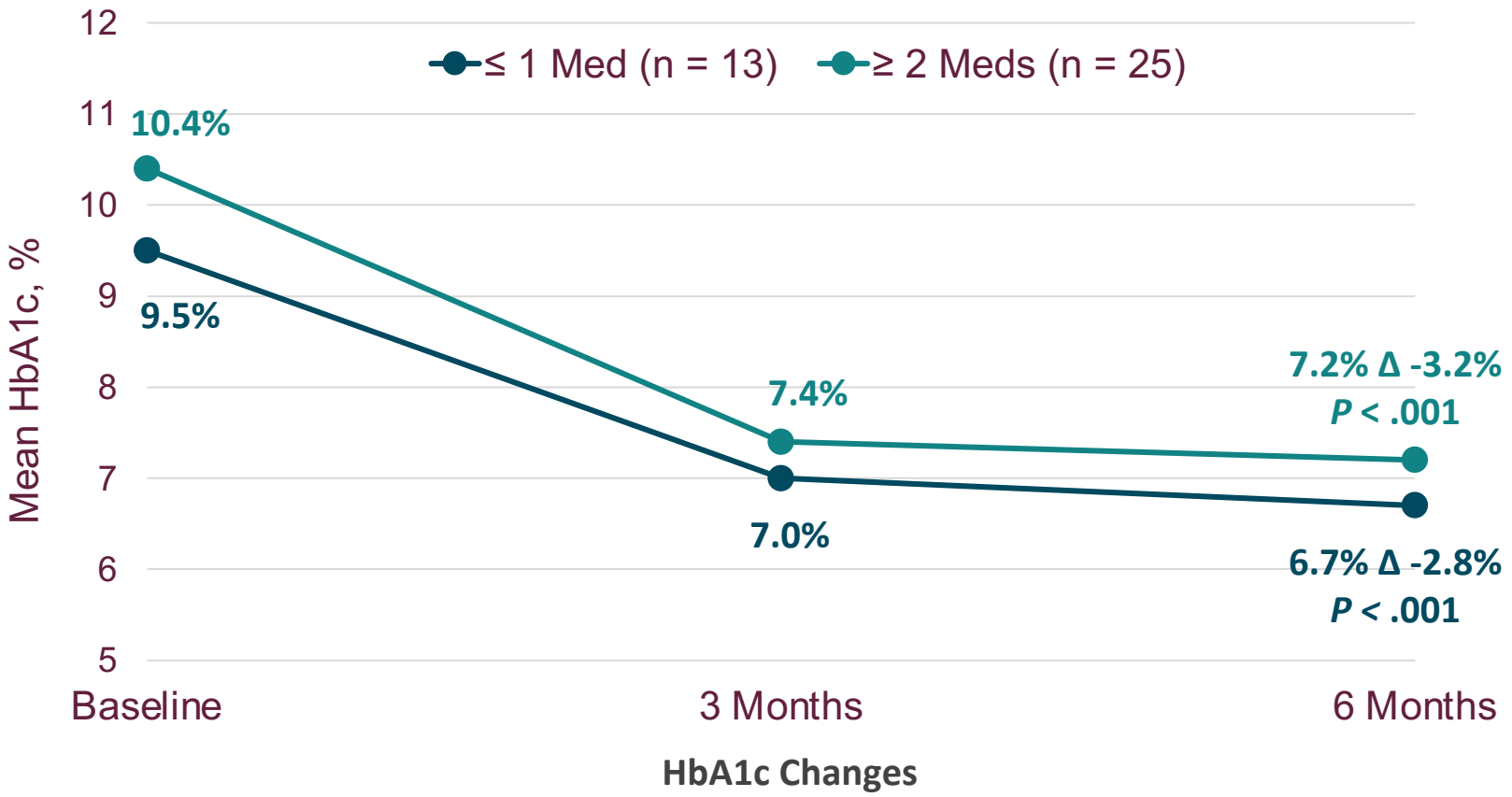
## ADA Standards of Care 2023[b]

rtCGM (**Grade A†**) or isCGM (**Grade B‡**) should be offered for diabetes management in adults with diabetes on MDI insulin regimen or CSII, and should be used for diabetes management in adults with diabetes on basal insulin

Initiation of CGM, CSII, or AID early in the treatment of diabetes can be beneficial (**Grade C§**)

*Very strong recommendation; †Clear evidence from well-conducted, generalizable randomized controlled trials that are adequately powered; ‡Supportive evidence from well-conducted cohort studies; §Supportive evidence from poorly controlled or uncontrolled studies. AACE, American Association of Clinical Endocrinology; ADA, American Diabetes Association; BEL, best evidence level; CSII, continuous subcutaneous insulin infusion; MDI, multiple daily injections. a. Blonde L, et al. Endocr Pract. 2022;28:923-1049; b. ElSayed NA, et al. Diabetes Care. 2023;46(suppl)S111-S127.

# Real-World Study




| rtCGM (G6) in T2D With/Without Insulin |
|---|
| N = 38 T2D, prospective, interventional, single-arm study 26 weeks |
| Primary outcomes: changes in HbA1c, BG, %TIR, %TBR, %TAR |

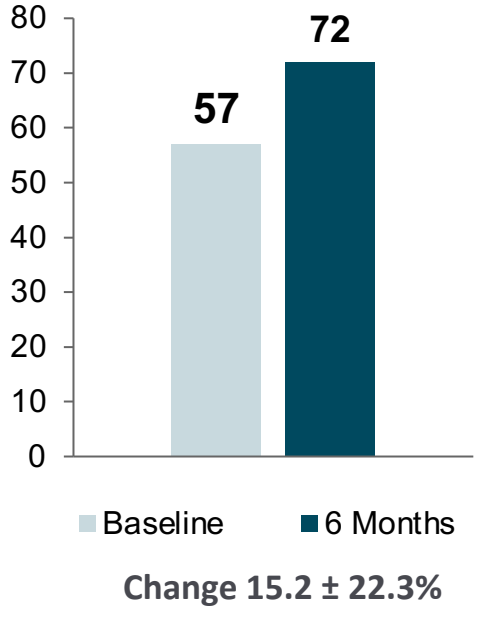
BG, blood glucose; TAR, time above range; TBR, time below range.

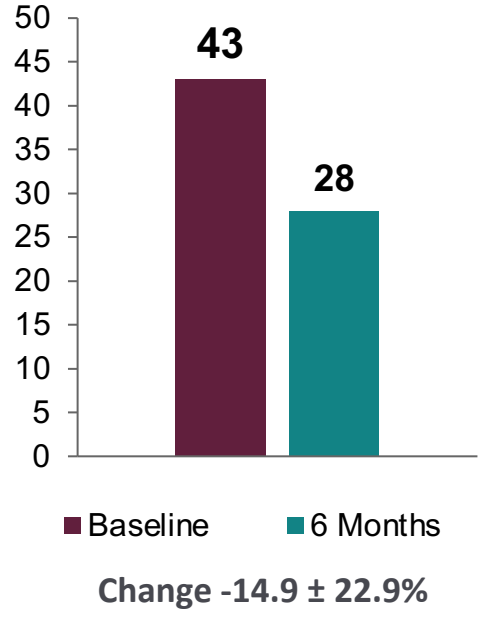
Grace T, et al. Diabetes Technol Ther. 2022;24:26-31.

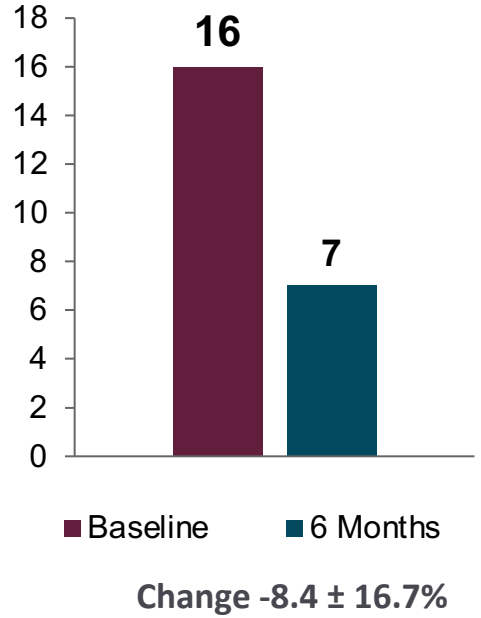
# Percent Time in Range Changes

Time in Range

Time Above Range




| Study Limitations |
| --- |
| Findings do not accurately assess the actual changes that occurred relative to glycemic status before rtCGM initiation |
| Diverse study population |
| Findings cannot be generalized to the broader T2D population |
| 6-month study duration |

Grace T, et al. Diabetes Technol Ther. 2022;24:26-31.

# Glycemic Management and Treatment Plan Should Not Be Defined by HbA1c Alone

| HbA1c, % | Glucose, mg/dL | 95% CI |
|---|---|---|
| 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) |

- May underestimate or overestimate average glucose **(eg, HbA1c 7% could represent a range between 123 mg/dL and 185 mg/dL)**
- Does not indicate extent or timing of hypoglycemia or hyperglycemia
- Does not reveal glycemic variability
- Limited utility for insulin dosing decisions
- Unreliable in patients with hemolytic anemia, hemoglobinopathies, or iron deficiency
- Underestimates in end-stage kidney disease or during pregnancy
- Correlation with mean glucose can vary among races

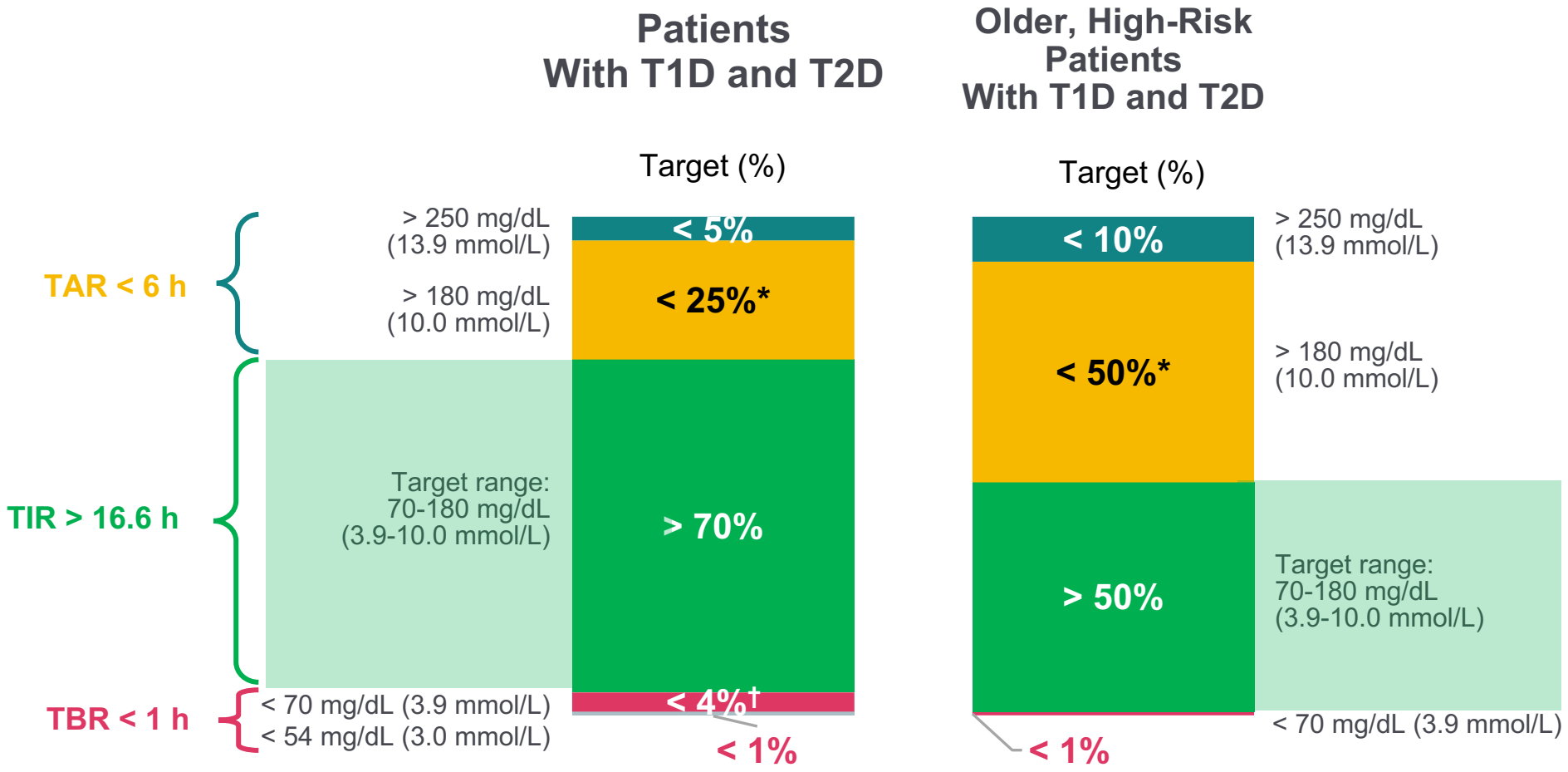
American Diabetes Association. Diabetes Care. 2020;43(Suppl 1):S66-S76; Nathan DM, et al. Diabetes Care. 2008;31:1473-1478.

# Pre-Test | Question 8

**Which of the following is a treatment recommendation for adults with type 2 diabetes who have an A1c goal of < 7.0%**

a) Time above range should be less than 50%
b) Time in range should be > 50%
c) Time in range should be > 70%
d) Time below range should be < 10%

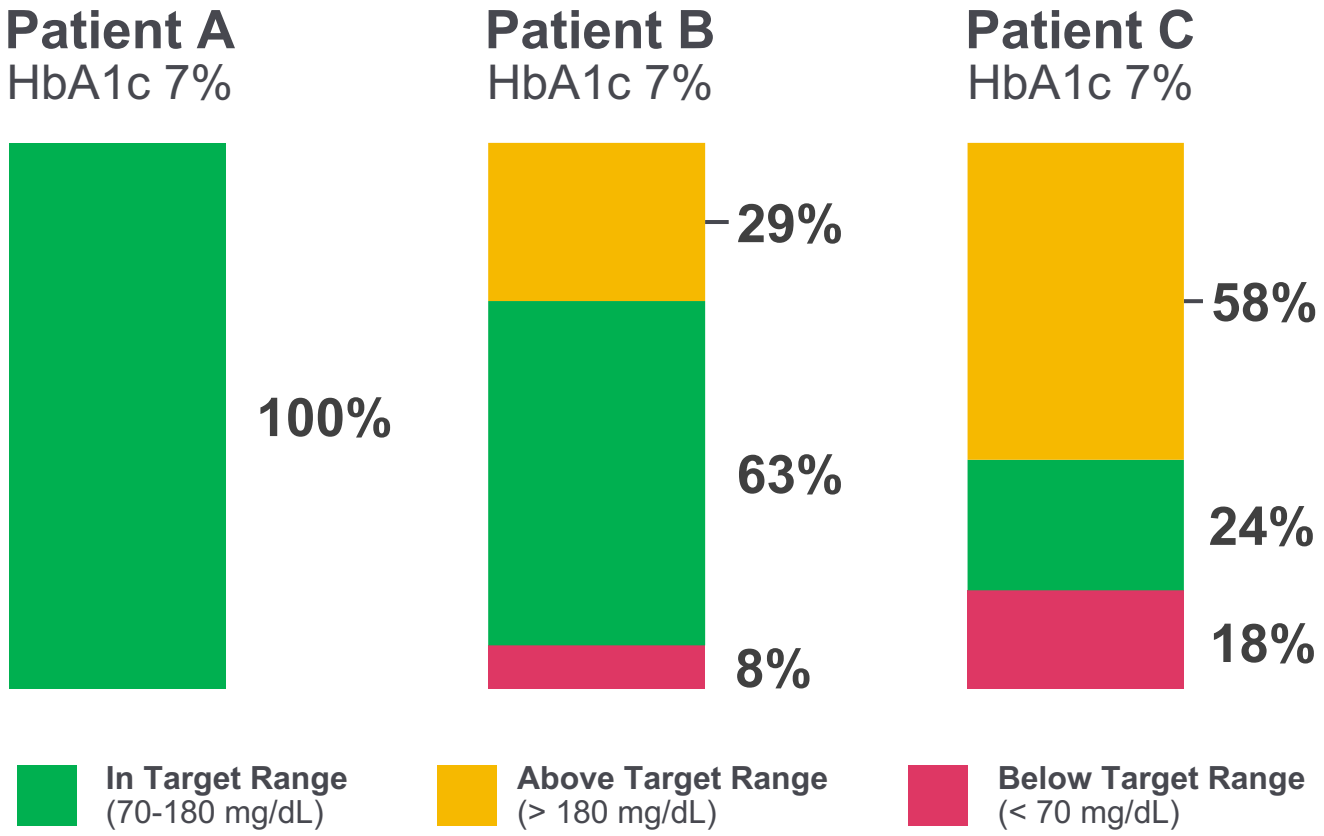
# Time in Range (TIR) Targets for CGM Data Interpretation




*Includes percentage of values > 250 mg/dL. †Includes percentage of values < 54 mg/dL.

Battelino T, et al. Diabetes Care. 2019;42:1593-1603.

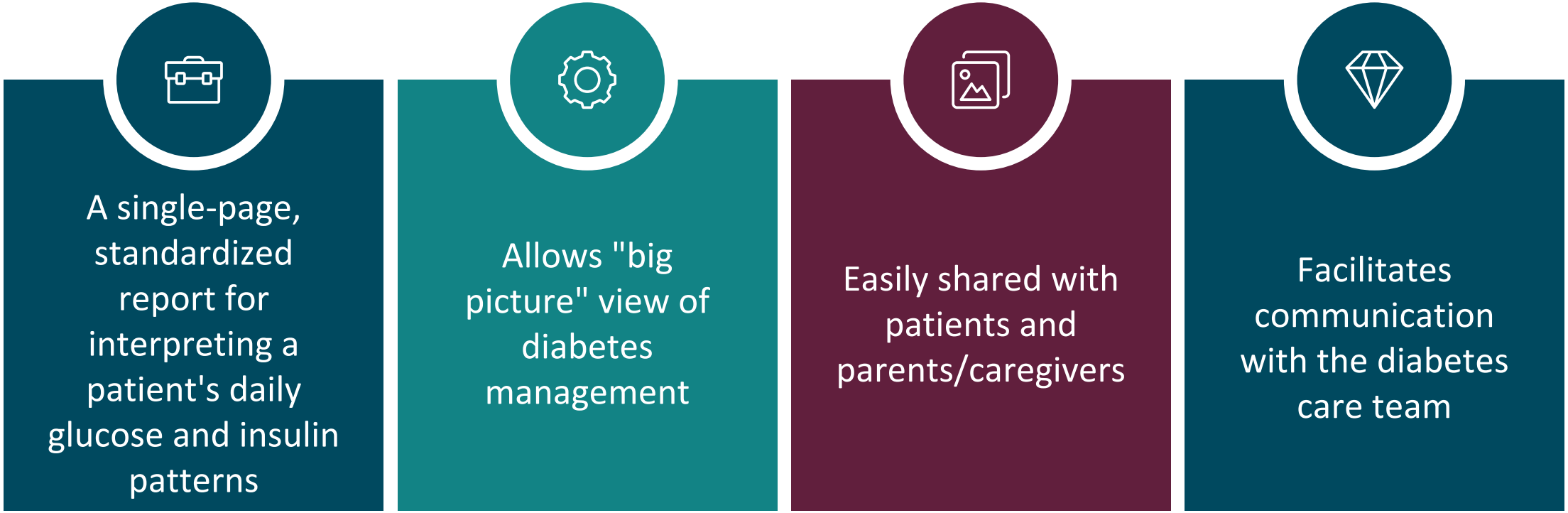
# Equal HbA1c Values Do Not Equal TIR




- HbA1c provides only an average of a patient's glucose history
- TIR provides more actionable information than HbA1c alone and should complement HbA1c
- Each 5% increase in TIR is clinically beneficial

Battelino T, et al. Diabetes Care. 2019;42:1593-1603.

# The Ambulatory Glucose (AGP) Report Summarizes CGM Data




AGP, ambulatory glucose profile.

Johnson ML, et al. Diabetes Technol Ther. 2019;21(suppl):S2-17–S2-25.

# 3 Sections of the AGP Report

## Metrics, Values, Goals

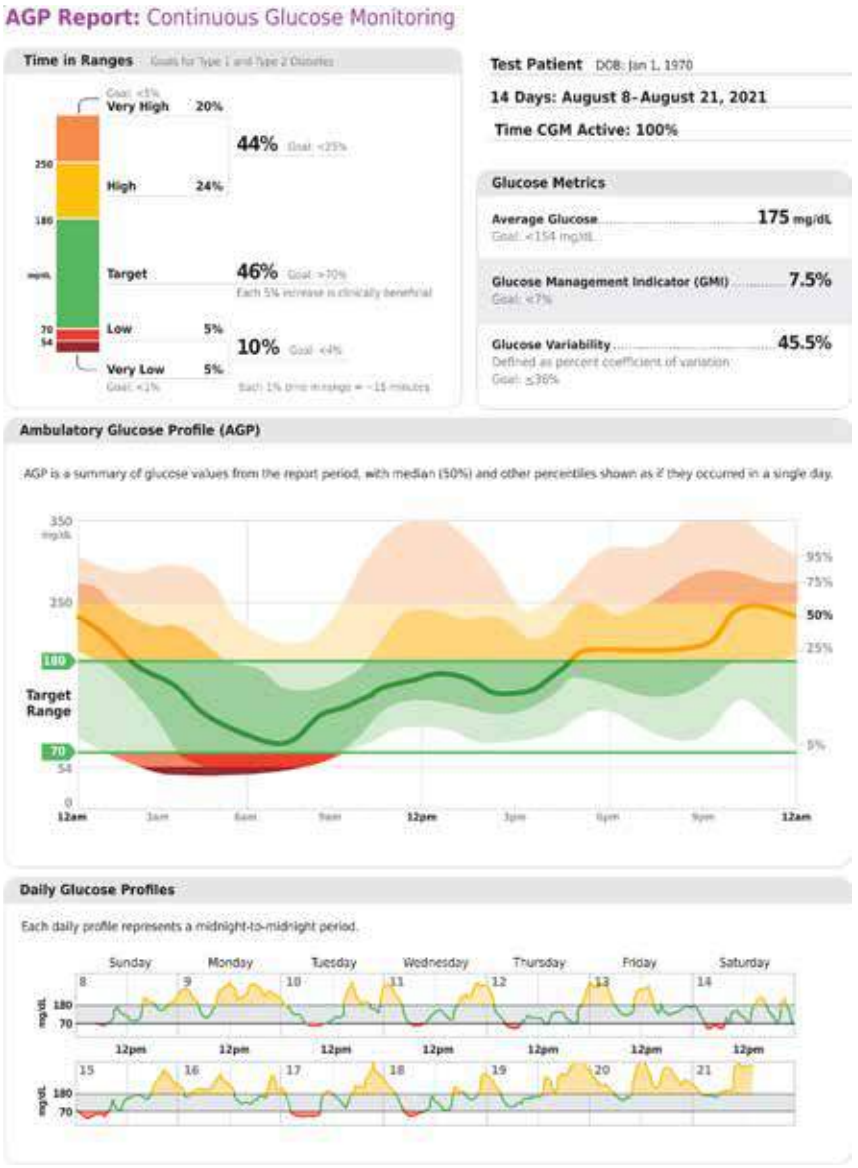
Summary of values to help assess the overall quality of glucose management

## AGP Profile

Shows all values as if collected over a single 24-h period. Shows variability in the mean glucose and patterned areas of highs and lows

## Daily Views

Shows daily values -- helpful in determining causes of patterns or exceptions to usual patterns



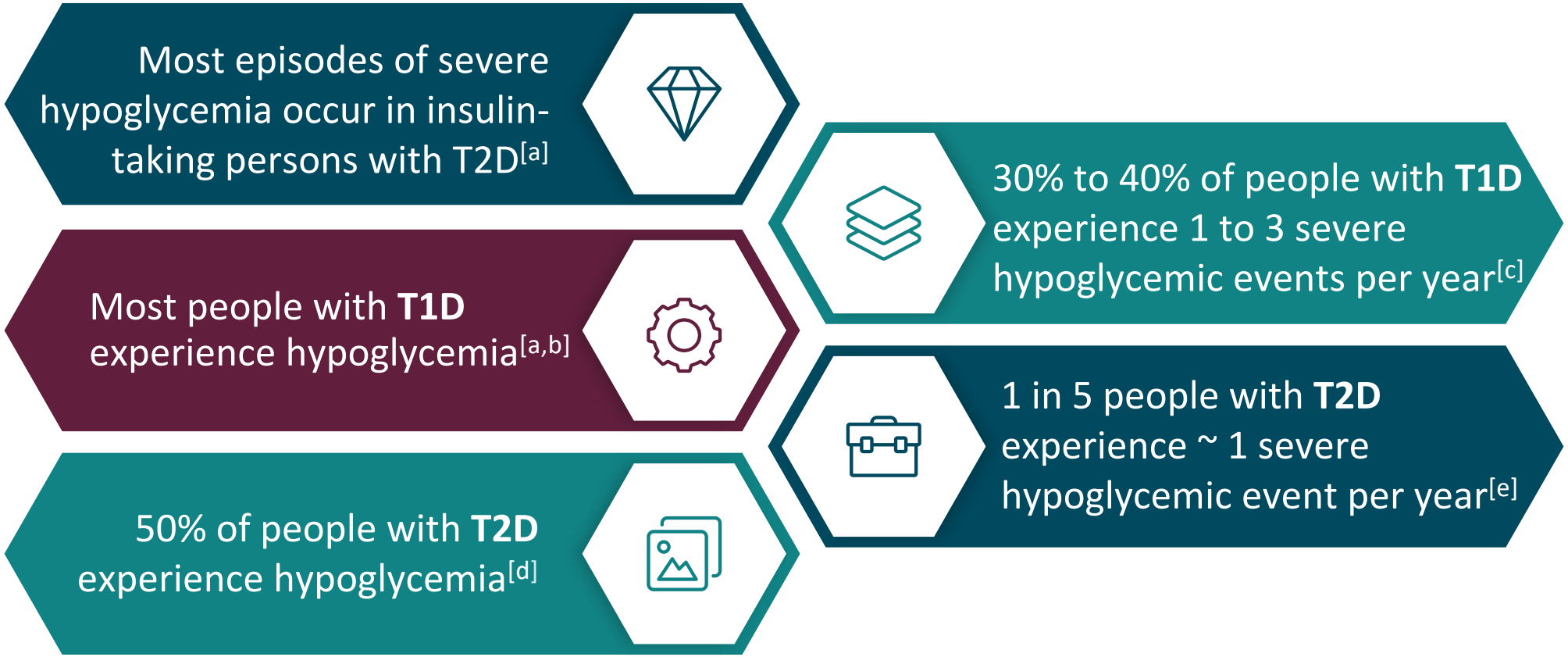

ElSayed NA, et al. Diabetes Care. 2023;46(suppl):S97-S110.

# Pre-Test | Question 9

**Which of the following statements is true regarding hypoglycemia in people with diabetes?**

a) Hypoglycemia is only seen when the HbA1c is <8%
b) Is rare in type 2 diabetes
c) Is equally common in people with an HbA1c levels of <7% and >9%
d) It is not necessary to provide Glucagon prescriptions for type 2 diabetes on Insulin

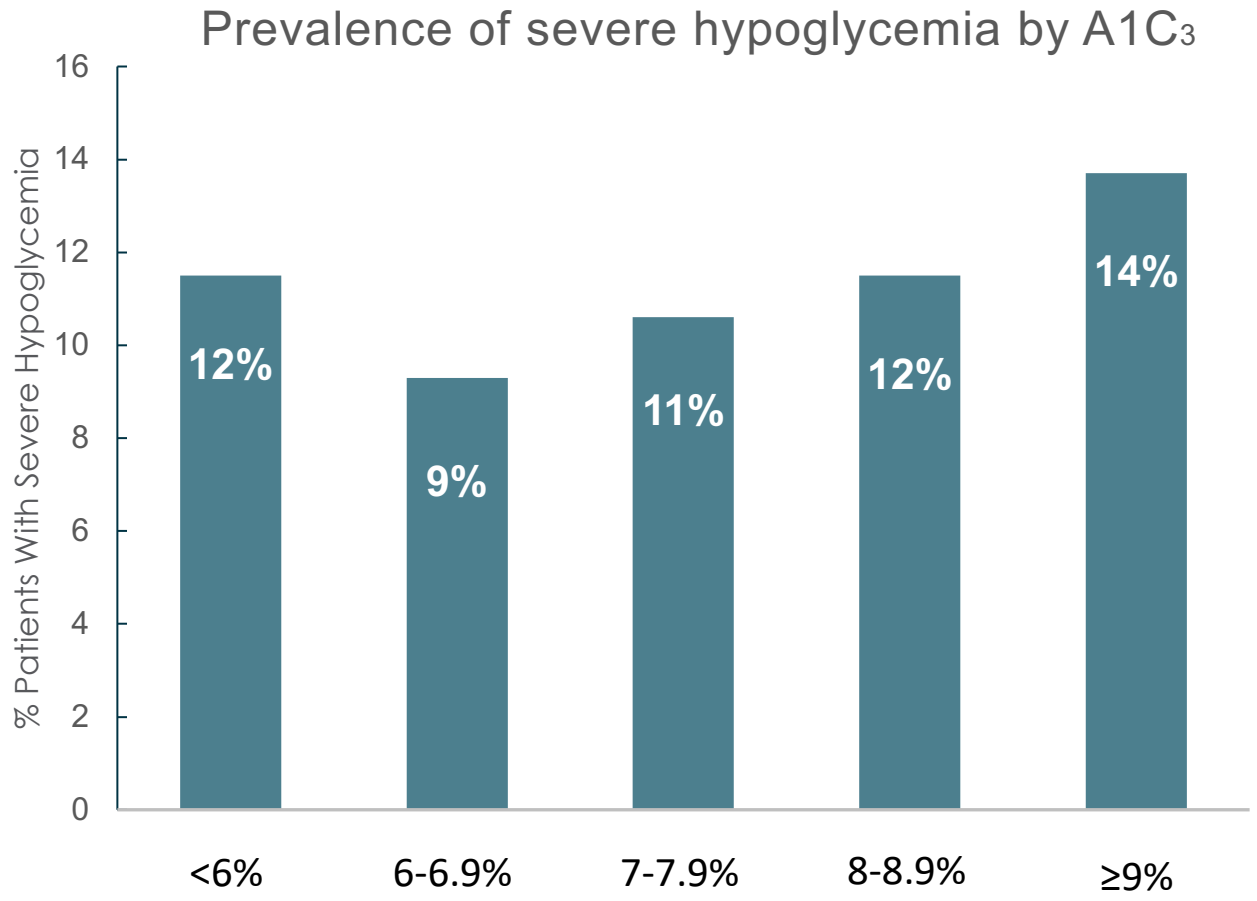
# Severe Hypoglycemia Is Common in People With Diabetes




a. Cryer PE. Diabetes. 2008;57:3169-3176; b. Spanakis EK, et al. Endotext. 2018; c. International Hypoglycaemia Study Group. Diabetes Care. 2015;38:1583-1591; d. Gehlaut RR, et al. J Diabetes Sci Technol. 2015;9:999-1005; e. Edridge CL, et al. PLoS One. 2015;10:e1026427.

# HbA1C Does Not Reveal Glycemic Variability or Extent or Timing of Hypoglycemia


9094 persons with Type 2 diabetes (ages 30-77 years) in Kaiser Diabetes Registry on glycemic lowering medication surveyed




1. Nathan DM et al. Diabetes Care. 2008;31(8):1473-1478. 2. Lipska KJ et al. Diabetes Care. 2013:36(11):3535-3542 3. Hirsch, I.F. et al. Diabetic Medicine. 2019;36(12;1637-1642

# Burden of Hypoglycemia is Prevalent in T2D Not on Insulin

Retrospective analysis of 2,708,762 Medicare Advantage Beneficiaries

**19.4%**

Hypoglycemic Related Encounters (HREs)

**Prior to the 1st HRE**

- 26% were using sulfonylurea
- 35.9% had evidence of CKD
- 11.5% had CKD + sulfonylurea

**>80%**

Occurrence in Ambulatory Care Setting

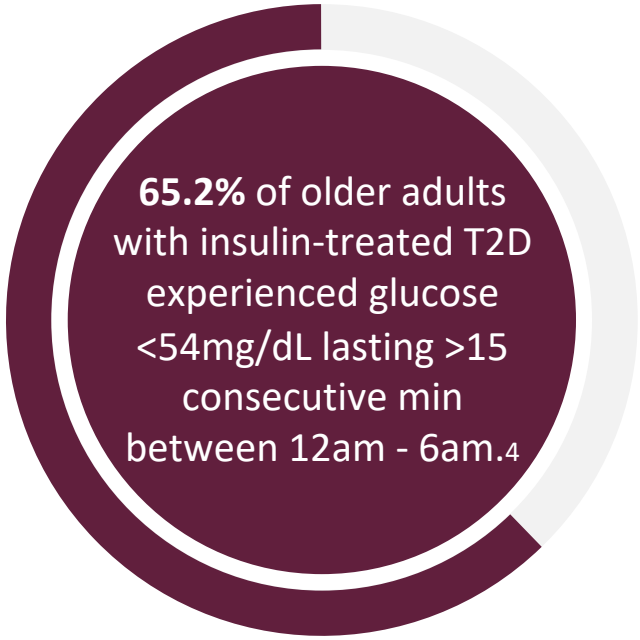
Primary care clinicians should be aware of the latest eligibility criteria for Medicare's coverage of CGM*

*Medicare covers Dexcom CGM for non-insulin-requiring patients with hypoglycemia who meet the Medicare coverage criteria. For a list of Medicare coverage criteria, visit the Centers for Medicare and Medicaid Services website

Hannah K. et. Al. Burden of Hypoglycemia in Medicare Advantage Beneficiaries with Type 2 Diabetes Not on Insulin. Presented at ADA Scientific Sessions; June 23-26, 2023; San Diego, CA 06/2023.

# Older Adults have Greater Risk of Hypoglycemia

The percentage of adults with diabetes increases with age, reaching **29.2%** among those aged 65 years or older.[1]




Level 2 Hypoglycemia

**Hypoglycemia** in this age group is associated with significant morbidities leading to both physical and cognitive dysfunction leading to frailty and disability.2

**Severe hypoglycemia** is increased in older adults with diabetes, regardless of diabetes management.3

**Recurrent hypoglycemia** is common in older people with diabetes and is likely to be less recognized and under reported by patients and health care professionals.2

**Nocturnal Hypoglycemia** is very common and largely undiagnosed in older adults with insulin-treated T2 diabetes.4

1. Centers for Disease Control. National Diabetes Statistics Report 2022: Estimates of Diabetes and Its Burden in the United States. https://www.cdc.gov/diabetes/data/statistics-report/index.html. (Accessed April 22, 2022).
2. Abdelhafiz AH, et al. Hypoglycemia in older people - a less well recognized risk factor for frailty. Aging Dis. 2015 Mar 10;6(2):156-67. doi: 10.14336/AD.2014.0330.
3. Weinstock RS et al. J Clin Endocrinol Metab. 2013;98(8):3411-9. doi: 10.1210/jc.2013-1589.
4. Boureau AS, et al. Nocturnal hypoglycemia is underdiagnosed in older people with insulin-treated type 2 diabetes: The HYPOAGE observational study. J Am Geriatr Soc. 2023;1–13. doi: 10.1111/jgs.18341.

# CMS Expanded CGM Coverage in 2023

**Effective April 16, 2023 | CMS 2023 Changes**

Meet ***at least*** 1 of the following criteria:

- Treated with **insulin**; or
- Documented **history of problematic hypoglycemia**
- Recurrent level 2 hypoglycemic events (glucose < 54 mg/dL) despite 2 or more attempts to adjust medication or modify treatment plan; **or**
- A history of **one level 3 hypoglycemic event** (glucose <54 mg/dL) requiring third-party assistance

As long as the beneficiary uses any insulin, the beneficiary is eligible for CGM coverage

CMS, Centers for Medicare & Medicaid Services.
Centers for Medicare & Medicaid Services. Accessed May 3, 2023. https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?lcdid=33822

# Basics of Billing for CGM

**Who owns the equipment?**

- Patient or provider: unique codes for each
- Service occurs over > 1 day
- Minimum of 72 hours of wear
- Download of receiver occurs in office, cloud-based printout, or electronic transfer
- Service can be charged at the day of download or time of analysis

**Interpretation of data**

- Minimum of 72 hours of wear time
- Face to face is not required, CPT standalone or with E&M Code
- Limitations of who can bill: physician, NP, PA (those who can prescribe)

# Codes and Descriptions

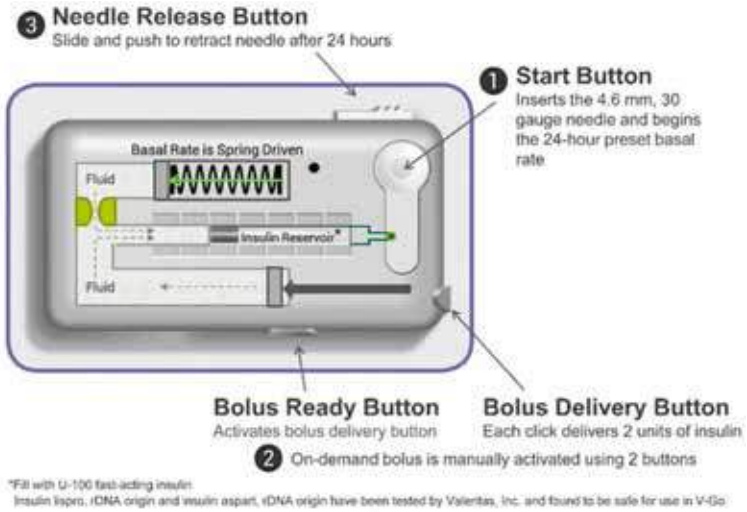
| | |
|---|---|
| 95249 | Personal CGM - Startup/Training: Ambulatory continuous glucose monitoring of interstitial tissue fluid via a subcutaneous sensor for a minimum of 72 h; patient-provided equipment, sensor placement, hook-up, calibration of monitor, patient training and printout of recording. (Do not report more than once while patient owns device) |
| 95250 | Professional CGM - Ambulatory continuous glucose monitoring of interstitial fluid via a subcutaneous sensor for a minimum of 72 h; clinician-provided equipment, sensor placement, hook-up, calibration of monitor, patient training removal of sensor, and printout of recording. (Do not report more than once per mo) |
| 95251 | Ambulatory CGM of interstitial tissue fluid via a subcutaneous sensor for a minimum of 72h; interpretation and report. (Do not report more than once per mo) |
| Evaluation and Management (E/M) Codes 99212-99215 | Established patient visit or G0463. (Medicare outpatient clinic visits) |
| Eversense Only Codes | 0446T (creation of subcutaneous pocket with insertion of implantable sensor, including system activation and patient education), 0447T (removal of implantable sensor from subcutaneous pocket via incision), 0448T (removal of sensor with creation of new pocket for new sensor at a different location, including system activation) |

Miller EM. Clin Diabetes. 2020;38:429-438.

# Disposable Insulin Patch Pumps

## Vgo

- Basal/bolus delivery using rapid-acting analog
- Basal available in 20, 30, or 40 units
- Bolus in 2-unit increments for a maximum bolus of 36 units for the day
- 1-day wear




## CeQur Simplicity

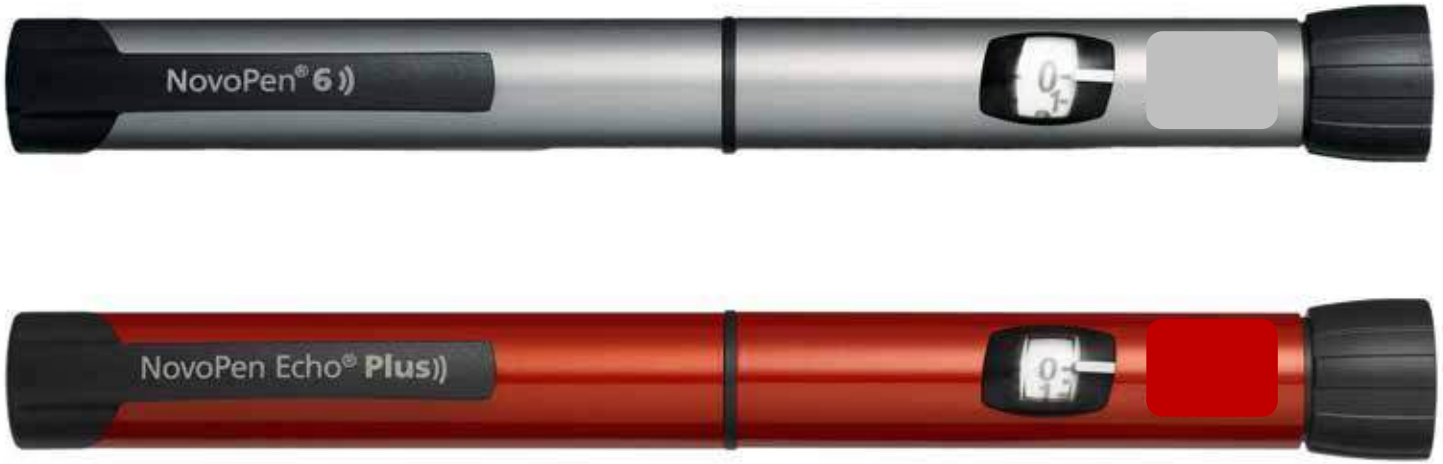
- Delivers mealtime, snack, or correction insulin for hyperglycemia
- Uses rapid-acting analog
- Bolus in 2-unit increments
- Holds 200 units of insulin
- Up to 3 days wear

# Tempo Smart Pen/Button & Platform


This cap is placed on a corresponding pen and can record the dose and time of an insulin injection.

It interfaces with tempo platform.

# NovoPen 6 and NovoPen Echo Plus




Smart pens can record dose and time of injections.

They can connect with apps to assist in management.

# Pre-Test | Question 10

Betty is a 58-year-old woman with a history of hypertension and dyslipidemia. She also has had Type 2 diabetes for 8 years. She is on medications such as **Atorvastatin 40mg, Lisinopril 20MGZX, semaglutide 2mg** (started 8 months ago (A1c was 9.2% before this and BMI 34)), and **Metformin 1500mg daily.** Her BMI is 32, and her HbA1c is 8.0%. She finds difficulties in reducing her fasting glucose to goal (132-166mg/dl, no lows). She also got a professional CGM, which indicated that in 15 days, 53% of the time, she was in high or very high time in range.

**What is the next best step for Betty to manage her glucose levels?**

a) Stop semaglutide and start a basal-bolus insulin program.
b) Stop metformin and semaglutide, start a basal insulin.
c) Continue metformin and semaglutide, and add a basal Insulin
d) No changes at this time, work with Diabetes Education to include Medical Nutritional Therapy to get to treatment goal.

# Bringing it All Together: Patient Cases

# Case 1: Betty

- Betty is a 58 y/o female
- She has had type 2 diabetes for 8 years
- History of Hypertension, dyslipidemia
- Medications:
  - Atorvastatin 40 mg
  - Lisinopril 20 MGZX
  - Semaglutide  2mg, started 8 months ago (A1c was 9.2% before this and BMI 34)
  - Metformin 1500 mg daily
- She is happy with her response but cannot seem to get her fasting glucose to goal (132-166 mg/dl, no lows)
- Thought glucose should be easier than BP and lipids– she has these well-managed
- BMI 32, A1c 8.0%
- Professional CGM obtained
  - Treatment Goal :  A1c <7% and when available TIR >70% with <5% low BG

# Case 1: Betty

## AGP Report

November 29, 2022 - December 13, 2022 (15 Days)

LibreView

### GLUCOSE STATISTICS AND TARGETS

| | |
|---|---|
| November 29, 2022 - December 13, 2022 | 15 Days |
| Time CGM Active: | 100% |

| Ranges And Targets For | Type 1 or Type 2 Diabetes |
|---|---|
| Glucose Ranges<br>Target Range 70-180 mg/dL | Targets % of Readings (Time/Day)<br>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 | 191 mg/dL |
| Glucose Management Indicator (GMI) | 7.9% |
| Glucose Variability | 31.8% |

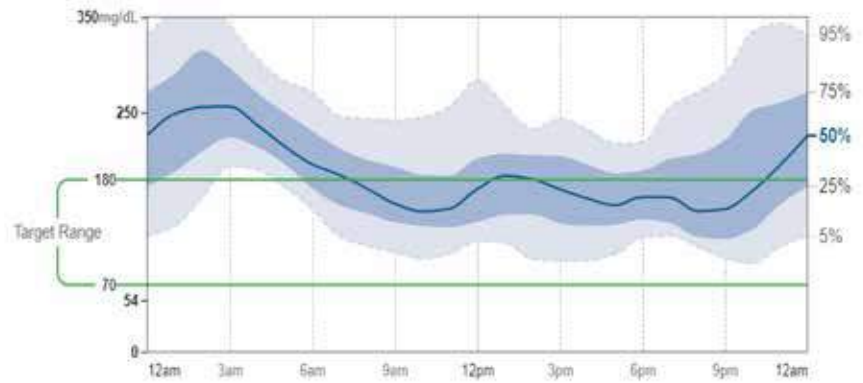
Defined as percent coefficient of variation (%CV)

### TIME IN RANGES


| | | | |
|---|---|---|---|
| Very High | >250 mg/dL | 17% | (4h 5min) |
| High | 181 - 250 mg/dL | 36% | (8h 38min) |
| Target Range | 70 - 180 mg/dL | 47% | (11h 17min) |
| Low | 54 - 69 mg/dL | 0% | (0min) |
| Very Low | <54 mg/dL | 0% | (0min) |

### AMBULATORY GLUCOSE PROFILE (AGP)

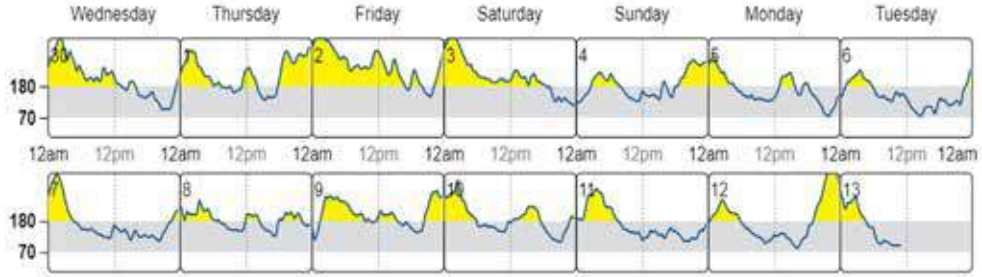
*AGP is a summary of glucose values from the report period, with median (50%) and other percentiles shown as if occurring in a single day.*




### DAILY GLUCOSE PROFILES

Most recent 14 days. See Weekly Summary report for more days.

*Each daily profile represents a midnight to midnight period with the date displayed in the upper left corner.*




Source: Battelino, Tadej, et al. "Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range." Diabetes Care, American Diabetes Association, 7 June 2019, https://doi.org/10.2337/dci19-0028.

# Case 1: Betty – Case Question

**What would your next steps be for Betty?**

1. Stop semaglutide and start  a basal-bolus insulin program.
2. Stop metformin and semaglutide, start a basal insulin.
3. Continue metformin and semaglutide, and add a basal Insulin
4. No changes at this time, work with Diabetes Education to include Medical Nutritional Therapy to get to treatment goal.

# Case 1: Betty - Plan

**Betty's Plan:**

- Continue Metformin and Semaglutide
- Refer for Diabetes Education to Include Medical Nutritional Therapy
- Start Basal insulin 20 Units at 9 pm daily
- Titrate Basal Insulin to appropriate Fasting Blood Glucose
- Prescribe Personal CGM
- Discuss prevention and treatment of hypoglycemia
- Prescribe Glucagon therapy

# Case 1: Betty

Betty is feeling back in control.

A1c is now 6.8%

Fasting glucose 80-110 mg/dl, random 80-152 mg/dl

No lows

Meds:
Metformin 2000 mg daily, semaglutide 2 mg weekly, basal insulin 24 units daily

Weight is stable

BMI 32

# Case 2: Javier

- Javier is a  67 years old male who was diagnosed with type 2 diabetes 8 months ago
- He was drinking and urinating more often. He thought it was a prostate problem. Did not want to take injections
- A1c at diagnosis was 12.1%
- Metformin 2000 mg daily (at diagnosis)
- Glimepiride 4 mg daily (at diagnosis)
- Sitagliptin 100 mg daily (1 month ago)
- Empagliflozin 25 mg daily (1 month ago)
- Has started walking 20-30 minutes daily
- Current A1c is 10.1%

# Case 2: Javier

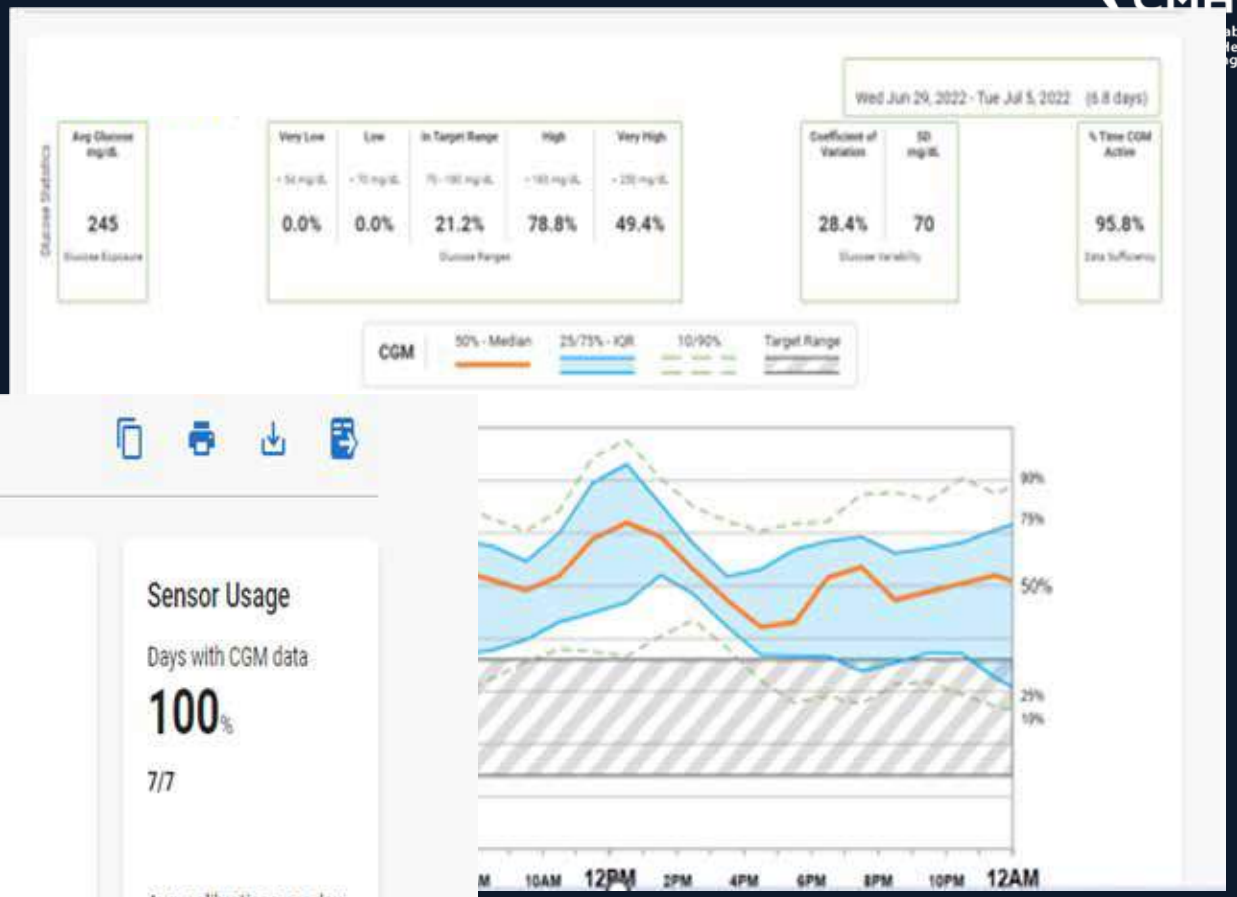
- He is very concerned about controlling his diabetes
  - His dad and uncle had complications from diabetes
  - He is monitoring several times daily
  - Understands need to lower BG and looking for options –not sure these medications are working
- Has met with a Diabetes Educator and received Medical Nutritional Therapy
- Wants to understand why his glucose jumps
- He is trying to “behave”

# Case 2: Javier – Case Question

**What do you recommend for Javier to help him understand his glucose patterns?**

a) 7-point glucose monitoring (fasting, before and after meals and bedtime)
b) No checking needed– he is not on insulin
c) Check only in the morning- once the fasting is at goal we can worry about the rest
d) Offer CGM pro version to wear

# Case 2: Javier – CGM Pro




7 Days Wed Jun 29, 2022 - Tue Jul 5, 2022

**Average Glucose**

245 mg/dL

Standard Deviation
70 mg/dL

GMI
N/A

**Time in Range**

50% Very High
29% High
21% In Range
0% Low
0% Very Low

Target Range:
70-180 mg/dL

**Sensor Usage**

Days with CGM data
100%
7/7

Avg. calibrations per day
0.0

# Case 2: Javier – Case Question

**What is your next treatment recommendation based upon his CGM?**

a) Do not change present medications, add basal Insulin
b) Stop Sitagliptin, keep Metformin and Empagliflozin add basal and bolus Insulin
c) Do not change present medications, add basal insulin and GLP-1 RA
d) Stop all medications except Metformin and add basal and bolus insulin

# Case 2: Javier - Plan

**Javier's Plan:**

- Metformin 2000 mg daily
- empagliflozin 25 Mg daily
- Glimepiride 4 mg daily
- Stop sitagliptin

- Add a Basal insulin, and titrate to fasting treatment goal
- Prescribe personal CGM
- Prescribe Glucagon

# Case 2: Javier

## 2 months later | Javier is feeling much better.

Basal insulin 42 units daily (0.4 units/kg)

Metformin, empagliflozin, glimepiride (only sometimes makes him feel shaky and hungry)

Fasting glucose readings are 100-130 mg/dl

Post-meal glucose readings are 100-220 mg/dl

A1c is now 8.0%, and he has some hypoglycemia if he walks rather than eating lunch

No severe hypoglycemic episodes

# Case 2: Javier – Case Question

**What do you recommend for Javier now?**

a) Stop basal insulin
b) Stop glimepiride
c) Stop glimepiride and start mealtime insulin
d) Stop glimepiride and start a GLP-1RA

# Case 3: Trevor

- 43-year-old man with type 2 diabetes for 10 years
- Co-morbidities: HTN, dyslipidemia, MASLD, no microvascular or macrovascular complications
- Meds: Glargine 40 units, Aspart  20 units before meal (may miss lunch dose), Metformin ER 1500 mg daily
- Has not had any diabetes education or medical nutritional therapy since diagnosis
- Wears CGM but does not look at it unless it alarms (and sometimes turns them off)
- A1c 8.6 %

# Case 3: Trevor

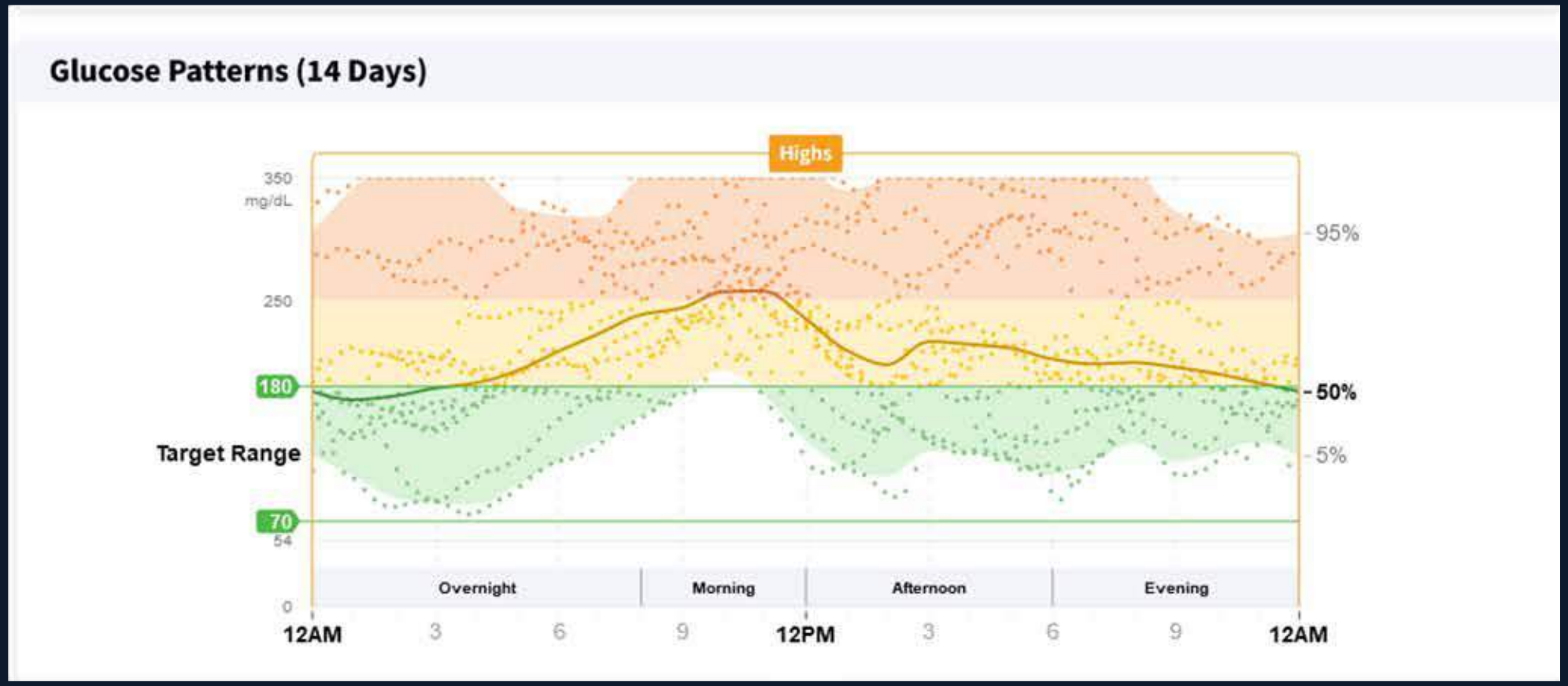



Image courtesy of Davida F. Kruger, MSN, APN-BC, BC-ADM.

# Case 3: Trevor - TM

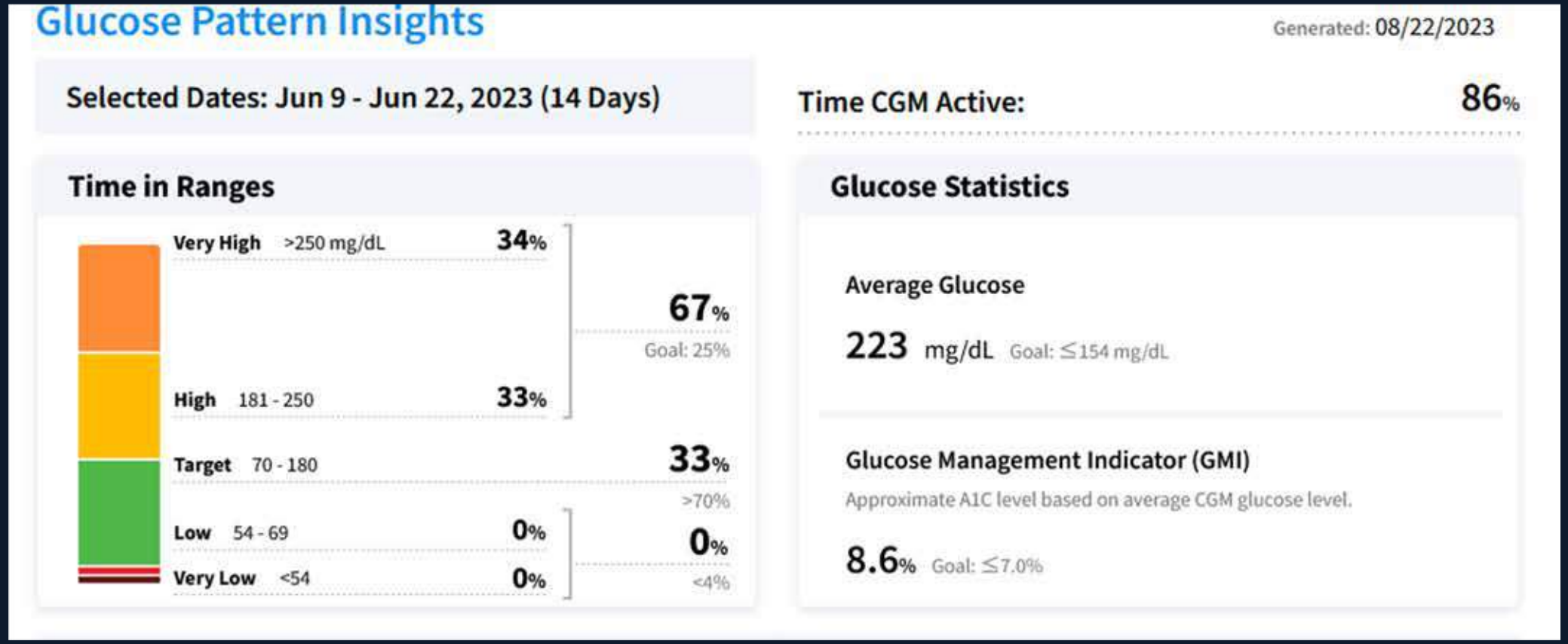



Image courtesy of Davida F. Kruger, MSN, APN-BC, BC-ADM.

# Case 3: Trevor – Case Question

**What do you notice on the CGM tracing?**

a) Persistent first am hypoglycemia
b) Global hyperglycemia
c) Morning meals are adequately covered
d) Lunch time dosing leads to hypoglycemia

# Case 3: Trevor – Case Question

**After reviewing this patients CGM data what changes would you make to his therapy?**

a) No changes at this time, A1c is 8.2%, refer to diabetes education
b) Increase both basal and rapid-acting insulin, add SGLT2 inhibitor, refer to diabetes education
c) Increase basal insulin only, refer to diabetes education
d) Increase basal insulin, continue rapid-acting insulin at the present dose add a weekly GLP1 RA, and refer to diabetes education.

# Case 3: Trevor - Plan

**Trevor's Plan**

- Increased Glargine to 46 units
- Continued Aspart to 20 units before each meal
- Added a weekly  GLP-1 RA
- Referred For Diabetes Education and Medical Nutritional Therapy
- Agreed on a A1c Goal <7% (with TIR >70% and <5% low Blood Glucose)
- Prescribed Glucagon pen
- Asked patient to use CGM more actively to help with insulin dosing

# Case 3: Trevor – Follow Up Data


Image courtesy of Davida F. Kruger, MSN, APN-BC, BC-ADM.

# Case 3: Trevor – Patient Comments