The Foundational Role of CGM for Outcome-Optimizing Behavioral and Lifestyle-Based Interventions

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Objectives

- Review potential barriers and opportunities to achieving glycemic and extra-glycemic success
- Describe the role of CGM in improving outcomes and patient engagement
- Discuss practical pearls to utilizing CGM into clinical practice

Disclosures

- Nothing to disclose

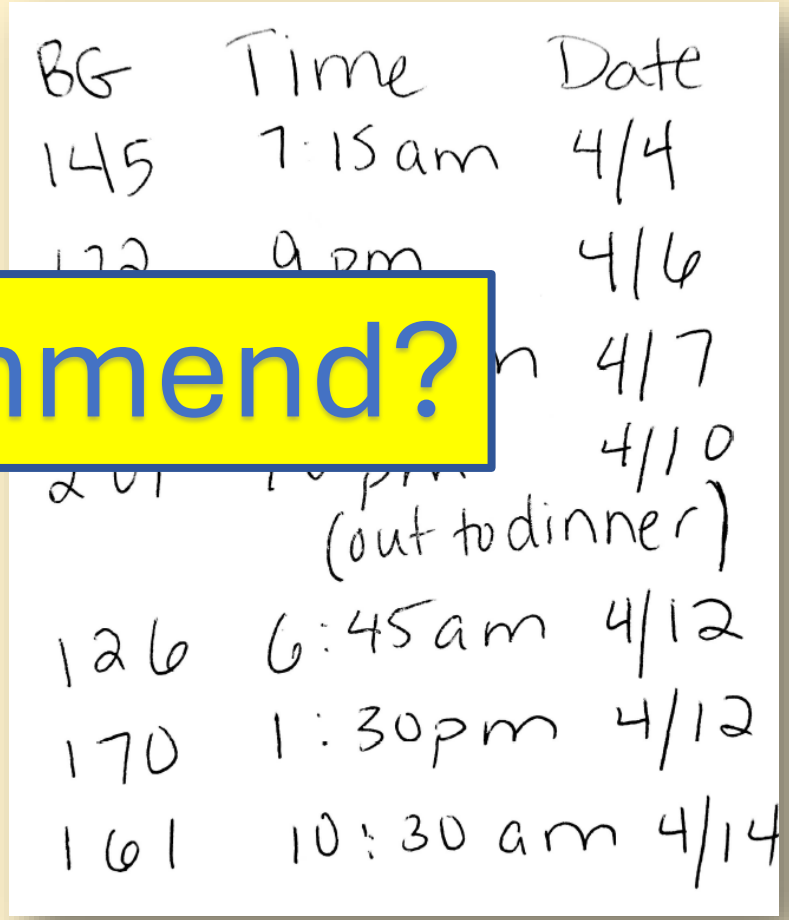
It is Wednesday and You Have One More Patient Before Lunch:

Max is 52 years old

Past me	**Hx of HTN, HLD, T2DM with microalbuminuria and**
Medications	-Sitagliptin -Glipizide -Lisinopril -Duloxetine

What would you recommend?

- ✓ Evaluation: BP 132/74, A1c 8.3% (down from 8.5% 3 months ago), Fasting glucose 105, LDL 65



Common Clinical Struggles

Provider Factors

- Knowledge barriers
- Availability of glucose data/trajectory
- Rapidly evolving area
  - Complexity of regimens
  - Evolving landscape of DM tx options/ indications
- Fear of hypoglycemia
- Perception bias
- Patient empowerment

Patient Factors

- Knowledge barriers
- Injection barrier
- DM distress
- Fear of hypoglycemia
- Misperceptions
- Language barriers
- Managing complications/ comorbidities
- Engagement
- Complexity of regimens

System Factors

- Time limitations
- Cost
- Uninsured/underinsured
- Social determinants of health
- Level of ancillary support
- Cultural and social biases
- Availability of healthy food sources
  - Food insecurity
  - Food deserts

And many more…

Clinicians and Persons With Diabetes Are in Need of Tools to Overcome Barriers and Improve Outcomes

Common Clinical Struggles

Not all A1c's are created equal

- Pair with glucose data
- Availability of self-monitoring of blood glucose (SMBG) varies
- SMBG = snapshot in time
- Glucose trajectory is unknown

Fundamental Barriers to Treatment Success

Glucose variability

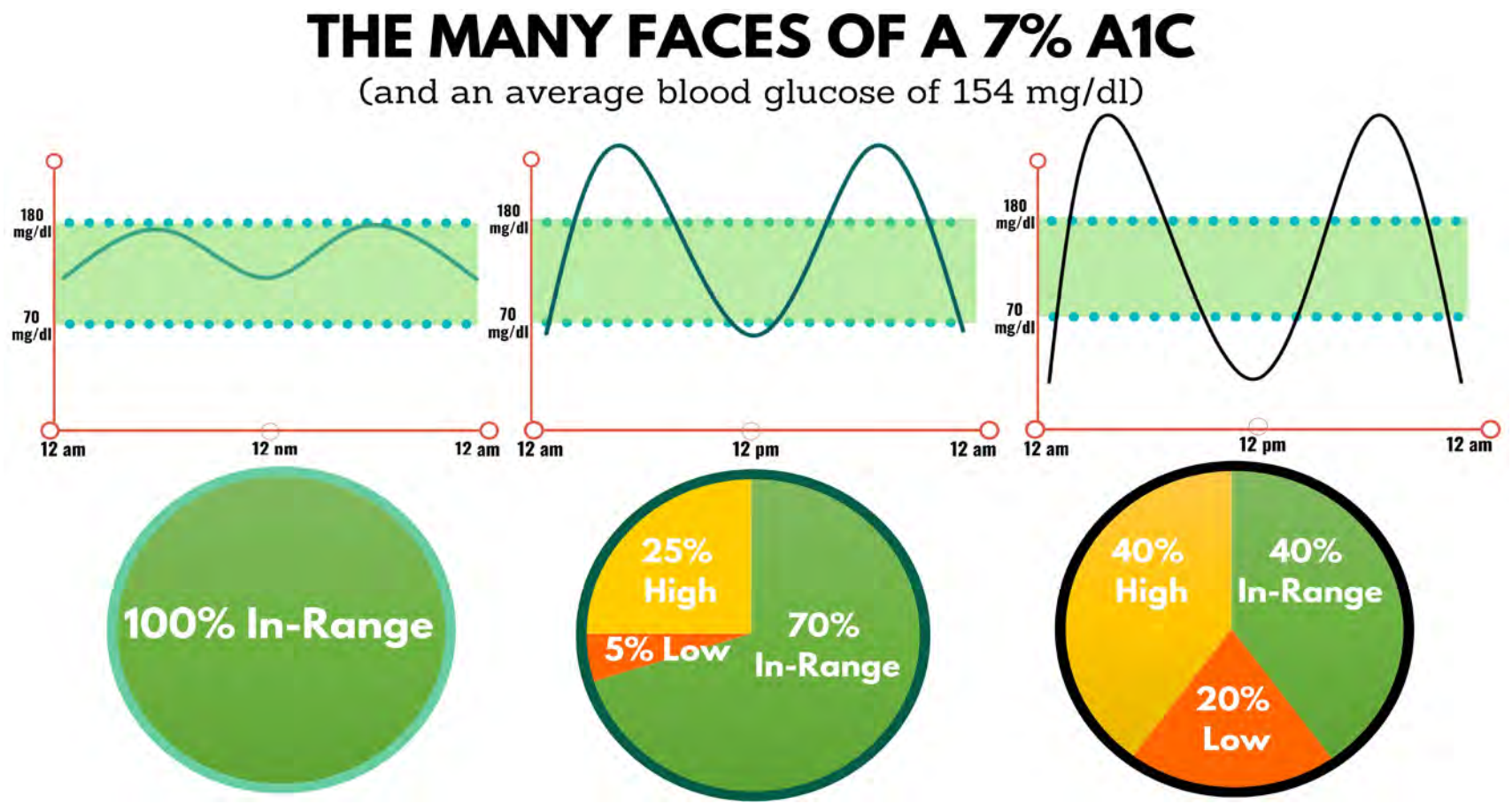
- "Coefficient of variation (CV)"
- Drives complications
- Increases hypoglycemia risk
- Contributes to non-adherence
- Prolongs clinical inertia
- Impacts disease burden

Higher CV[1]:

- Unfavorable metabolic profile
- Increased risk of developing micro- and macrovascular complications and mortality
- Association of CV of glucose was more consistent than A1c in predicting metabolic outcomes and complications

Slieker, Roderick C; et al. "Visit-to-visit variability of glycemia and vascular complications: the Hoorn Diabetes Care System cohort." Cardiovasc Diabetol. 2019 Dec 12;18(1):170. doi: 10.1186/s12933-019-0975-1.

Diabetes Technology: An Opportunity to Solve Persistent Problems



Reduce Residual Risk--Beyond A1c

Decrease glycemic variability: A1c + Time in Range

CGM Considerations

PROS

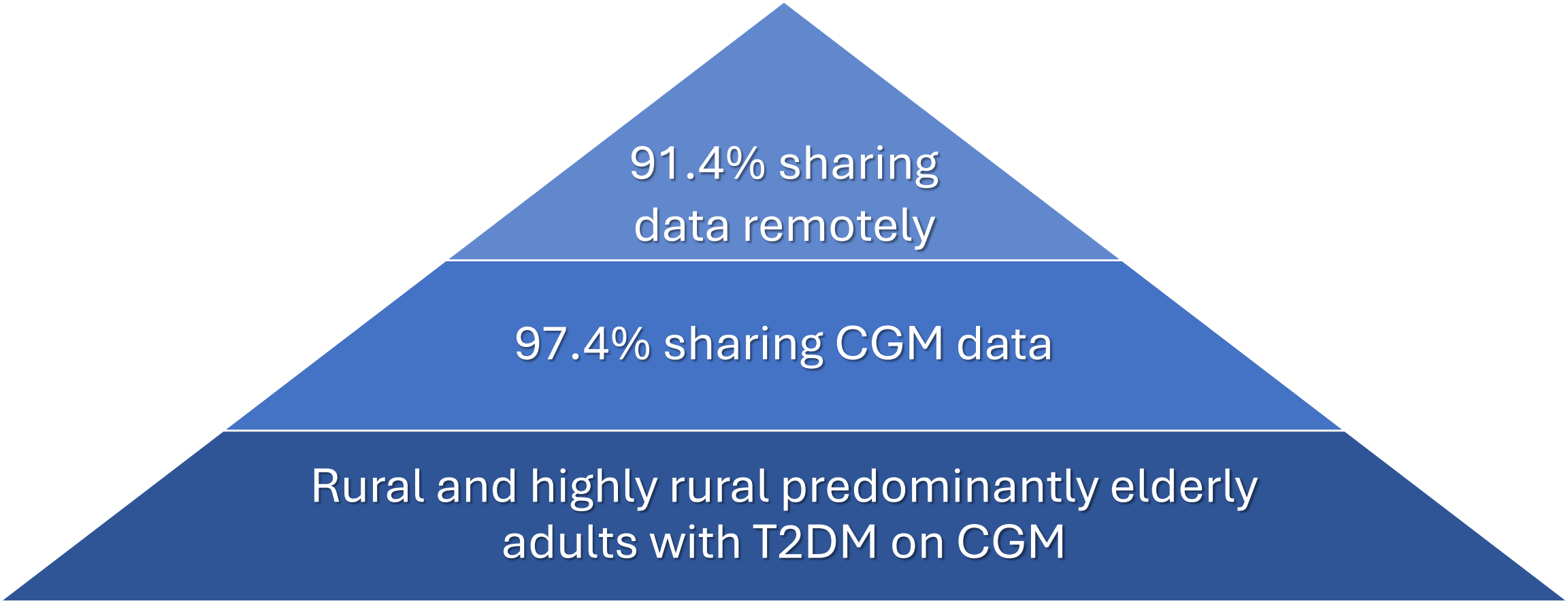
- Increased glycemic data
- Glucose trajectory
- Identification of glycemic triggers
- Unveil periods of unrecognized hyper- and hypoglycemia
- Facilitates patient engagement
- More easily enables treatment intervention

CONS

- Ancillary support
- Potential barriers
  - Technology
  - Connectivity
  - Knowledge
- Cost
- Time?

Lists are not exhaustive

Connectivity Statistics*



*Tele-Endocrinology Program Manager's Perspective

Guideline-Directed Therapy

American Diabetes Association: Standards of Medical Care in Diabetes—2025

Real-time CGM (rtCGM) or intermittently scanned CGM (isCGM)

- Recommend for diabetes management to youth and adults with diabetes on any type of insulin therapy.
- Consider in adults with type 2 diabetes treated with glucose-lowering medications other than insulin to achieve and maintain individualized glycemic goals
- The choice of CGM device should be made based on the individual's circumstances, preferences, and needs

Diabetes Care December 2024, Vol.48, S337-S343. doi:https://doi.org/10.2337/dc25-SDIS

Guideline-Directed Therapy

American Diabetes Association:
Standards of Medical Care in Diabetes—2025

- In circumstances when consistent use of CGM is not feasible, consider periodic use of personal or professional CGM to adjust medication and/or lifestyle. C)

Diabetes Care December 2024, Vol.48, S337-S343. doi:https://doi.org/10.2337/dc25-SDIS

Guideline-Directed Therapy

American Association of Clinical Endocrinology Consensus Statement: Comprehensive Type 2 Diabetes Management Algorithm 2023 Update

Real-time continuous glucose monitoring (rtCGM) or intermittently scanned continuous glucose monitoring (isCGM) is recommended for persons with T2D who:

- Are treated with insulin therapy or
- Have frequent or severe hypoglycemia, nocturnal hypoglycemia, or hypoglycemia unawareness
- isCGM: newly diagnosed with T2D and/or at low risk for hypoglycemia

Endocrine Practice 29 (2023) 305e340

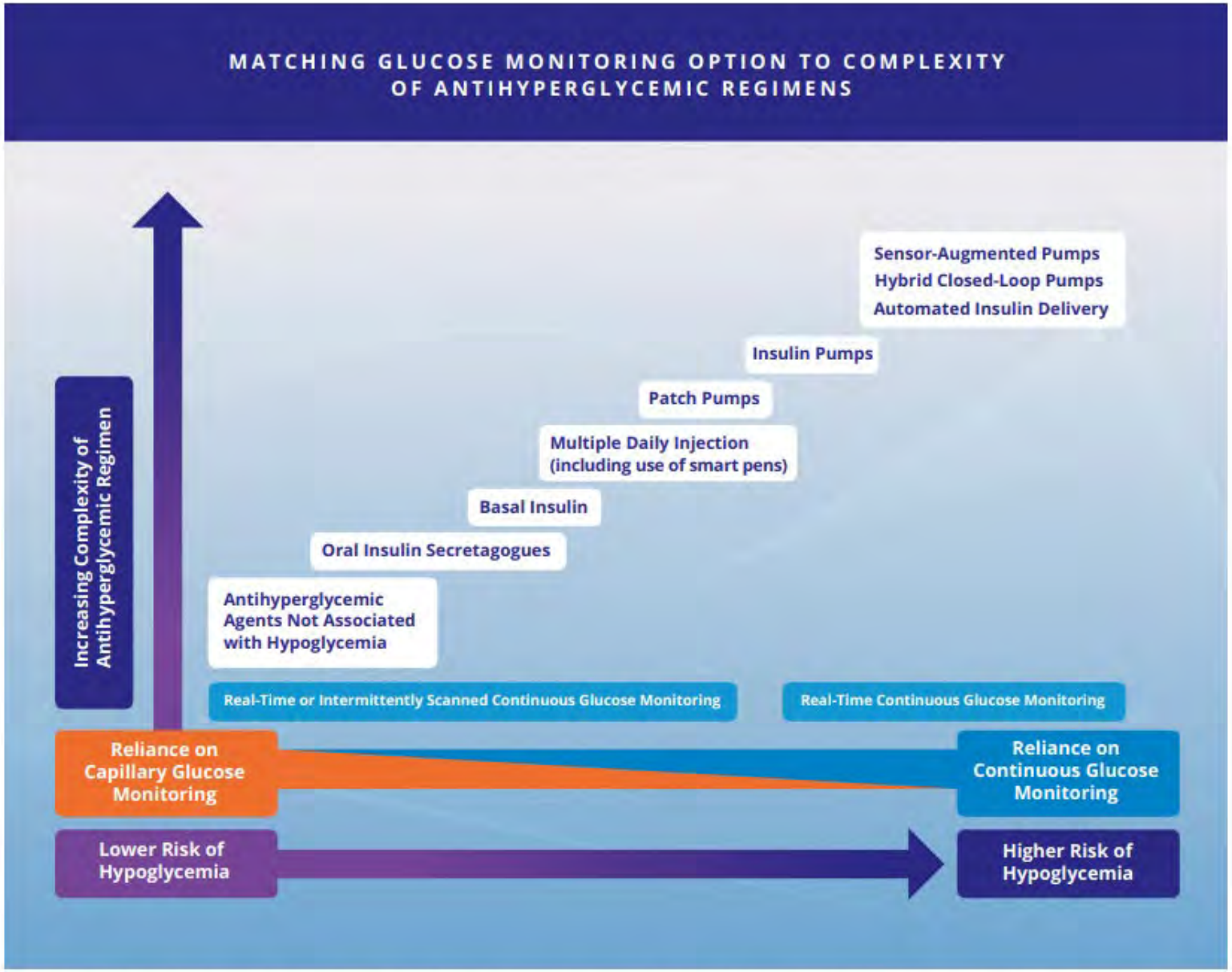


Figure 6. Matching Glucose Monitoring Option to Complexity of Antihyperglycemic Regimens.

RCT Information in T2DM

Glycemic benefits

- ↓ A1c; ↑ TIR
  - -MDI, mixed regimen, basal insulin
  - -Largely without change in insulin or other med doses
- ↓ A1c, TBR, TAR; ↑ TIR
  - -Not on insulin, also with intermittent use of CGM
- ↓ A1c, TAR; ↑ TIR
  - -Adults with and without insulin
- ↓ hypoglycemia on insulin
- ↓ A1c in adults on insulin
- ↓ A1c, mean glucose, GMI, TAR; ↑ TIR
  - In Adults not on insulin without difference in DM meds

Extra-Glycemic benefits

- Improved glucose monitoring, insulin administration, DM management, QoL in youth
- Improved user satisfaction not on insulin, with intermittent use of CGM
- Improved DM Tx Satisfaction Questionnaire in adults on insulin

RWD Information in T2DM

Glycemic benefits

- ↓ A1c and hypoglycemia in adults on MDI or basal insulin
- ↓ A1c in adults on basal insulin or non-insulin therapy
- ↓ Reduced A1c, ER visits/hospitalizations for hypoglycemia in adults on insulin
- ↓ mean glucose, GMI, TAR; ↑TIR and time in tight range for adults not on insulin

Extra-Glycemic benefits

- ↓ DKA, severe hypoglycemia, DM-related coma, hospitalizations for hypo/hyperglycemia in adults
- ↓ acute DM events, all-cause hospitalizations in adults with basal insulin or non-insulin therapy
- ↑ user satisfaction in adults on MDI or basal insulin

Available CGM/Biosensor Technology

Name		rtCGM or isCGM	Indications	Wear Time	Calibrations	Connectivity	Rx or OTC
Abbott	Freestyle Libre 2*	isCGM	T1DM, T2DM, GDM ≥4yo	14 days	None	App	Rx
	Freestyle Libre 2 Plus	isCGM	T1DM, T2DM, GDM ≥2yo	15 days	None	App, Omnipod 5, t:slim x2	Rx
	Freestyle Libre 3*	rtCGM	T1DM, T2DM, GDM ≥4yo	14 days	None	App	Rx
	Freestyle Libre 3 Plus	rtCGM	T1DM, T2DM, GDM ≥2yo	15 days	None	App, iLet Bionic Pancreas	Rx
	Lingo	Real-time biosensor	≥18yo without DM and without insulin	14 days	None	App	OTC
Eversense	E3	rtCGM	T1DM, T2DM ≥18yo	180 days	1-2/day	App	Rx
	Eversense 365	rtCGM	T1DM, T2DM ≥18yo	365 days	1/day-1/week	App	Rx

*Being phased out

Available CGM/Biosensor Technology

Name		rtCGM or isCGM	Indications	Wear Time	Calibrations	Connectivity	Rx or OTC
Dexcom	G6*	rtCGM	T1DM, T2DM, GDM ≥2yo	10 days	None	App, t:slim x2, Tandem Mobi, Omnipod 5	Rx
	G7	rtCGM	T1DM, T2DM, GDM ≥2yo	10 days	None	App, t:slim x2, Tandem Mobi, Omnipod 5	Rx
	G7 15 Day**	rtCGM	T1DM, T2DM, GDM ≥18yo	15.5 days	None	TBD	Rx
	Stelo	Real-time biosensor	T2DM and preDM not at risk for hypoglycemia ≥18yo	15.5 days	None	App	OTC
Medtronic	Guardian Sensor 3*	rtCGM	Varies depending on integrated device	7 days	2-4/day	App, MiniMed 630G/670G/770G/780G	Rx
	Guardian 4	rtCGM	T1DM ≥7yo	7 days	None	MiniMed 780G	Rx
	Simplera	rtCGM	T1DM, T2DM, GDM ≥18yo	7 days	None	App, InPen**	Rx

*Being phased out

**FDA Cleared

Newest CGM Technology

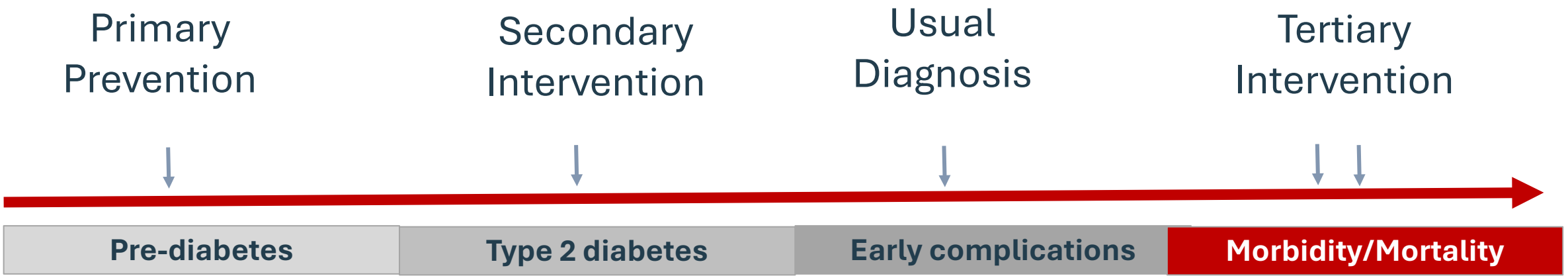
Name		rtCGM or isCGM	Indications	Wear Time	Calibrations	Connectivity	Rx or OTC
Abbott	Freestyle Libre 2 Plus	isCGM	T1DM, T2DM, GDM ≥2yo	15 days	None	App, Omnipod 5, t:slim x2	Rx
	Freestyle Libre 3 Plus	rtCGM	T1DM, T2DM, GDM ≥2yo	15 days	None	App, iLet Bionic Pancreas	Rx
	Lingo	Real-time biosensor	≥18yo without DM and without insulin	14 days	None	App	OTC
Eversense	Eversense 365	rtCGM	T1DM, T2DM ≥18yo	365 days	1/day-1/week	App	Rx
Dexcom	G7	rtCGM	T1DM, T2DM, GDM ≥2yo	10 days	None	App, t:slim x2, Tandem Mobi, Omnipod 5	Rx
	G7 15 Day*	rtCGM	T1DM, T2DM, GDM ≥18yo	15.5 days	None	TBD	Rx
	Stelo	Real-time biosensor	T2DM and preDM not at risk for hypoglycemia ≥18yo	15.5 days	None	App	OTC
Medtronic	Guardian 4	rtCGM	T1DM ≥7yo	7 days	None	MiniMed 780G	Rx
	Simplera	rtCGM	T1DM, T2DM, GDM ≥18yo	7 days	None	App, InPen*	Rx

*FDA Cleared

CGM-Mediated Improvements in HbA1c and Regimen Adherence in the Setting of GLP-1 RAs

James R. Gavin III, MD, PhD
Chief Medical Officer
Healing Our Village, Inc.
Clinical Professor of Medicine
Emory University School of Medicine

Development of Diabetes is a Journey with Potential for intervention en Route



Goals of prevention

- Preventing or delaying the onset of DM
- Preserving beta cell function
- Preventing or delaying complications/death
- Reducing costs of care

The Major Problem—We Haven't Made Progress: Risk Profile Trends in US Adults With CVD, 1999-2018[1,a]

A1C

- Overall worsening trend
- 52% with ideal profile (A1C <7% if diabetes or 5.7% if not) in 2015-2018
- Worst profile in Asian adults

Non–HDL-C

- Overall improving trend
- 30% with ideal profile (non–HDL-C <100 mg/dL) in 2015-2018
- Worsening trend in Hispanic adults

Smoking

- Overall unchanged
- 78% with ideal profile (never smoked or quit smoking >1 year) in 2015-2018
- Worsening trend in Black adults

Blood Pressure

- Overall worsening trend after 2010
- 49% with ideal profile (BP <130/80 mm Hg) in 2015-2018
- Worst profile in Black adults

Body Mass Index

- Overall worsening trend
- 18% with ideal profile (BMI <25 kg/m^2) in 2015-2018
- No interaction of trends with race/ethnicity

Moderate or Vigorous Physical Activity

- Overall worsening trend
- 22% with ideal profile meeting guideline-recommended levels in 2015-2018
- Improving trend in Hispanic adults

Diet

- Overall unchanged
- 1% with ideal profile (HEI score ≥80) in 2015-2018
- No interaction of trends with race/ethnicity

[a] N = 6,335 US adults with self-reported history of CVD.

1. Gao Y et al. *JACC*. 2022;80:126-137.

Percent Risk Reduction of Diabetes-Related Complications in Patients with T2DM for Each 1% Decrease in A1C

UKPDS 10-year follow-up showed a "legacy" effect: continued risk reduction for microvascular complications and emergent risk reduction for myocardial infarction and death from any cause[2]

Study design: Prospective observational study of 4585 UKPDS patients with T2DM from 23 hospital-based clinics in the United Kingdom. Total of 3642 patients were included in relative-risk analyses. Data adjusted for age, blood pressure, gender, ethnic background, smoking, albuminuria, HDL, LDL, and triglycerides.

Stratton IM et al. *BMJ*. 2000;321(7258):405-412. Holman RR et al. *N Engl J Med*. 2008;359(15):1577-1589.

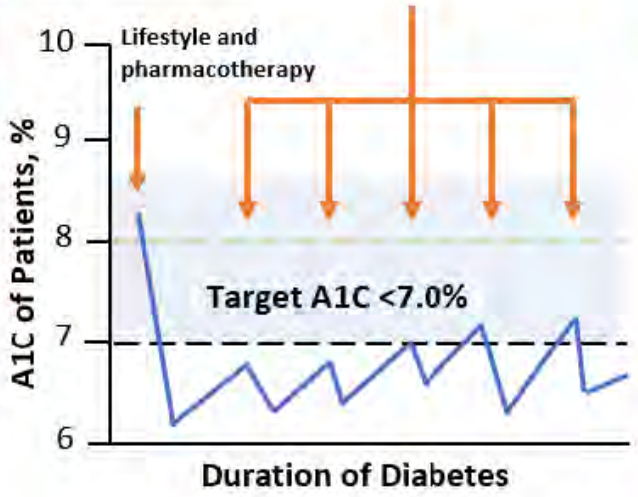
Coming Full Circle: Prioritizing Early Glycemic Management to Reduce Microvascular and Macrovascular Complications[1]

Focus on multimorbidity: glycemic and weight management and risk factors related to T2DM comorbidities

Individual with T2DM

Lifestyle

Early management of multifactorial risk factors



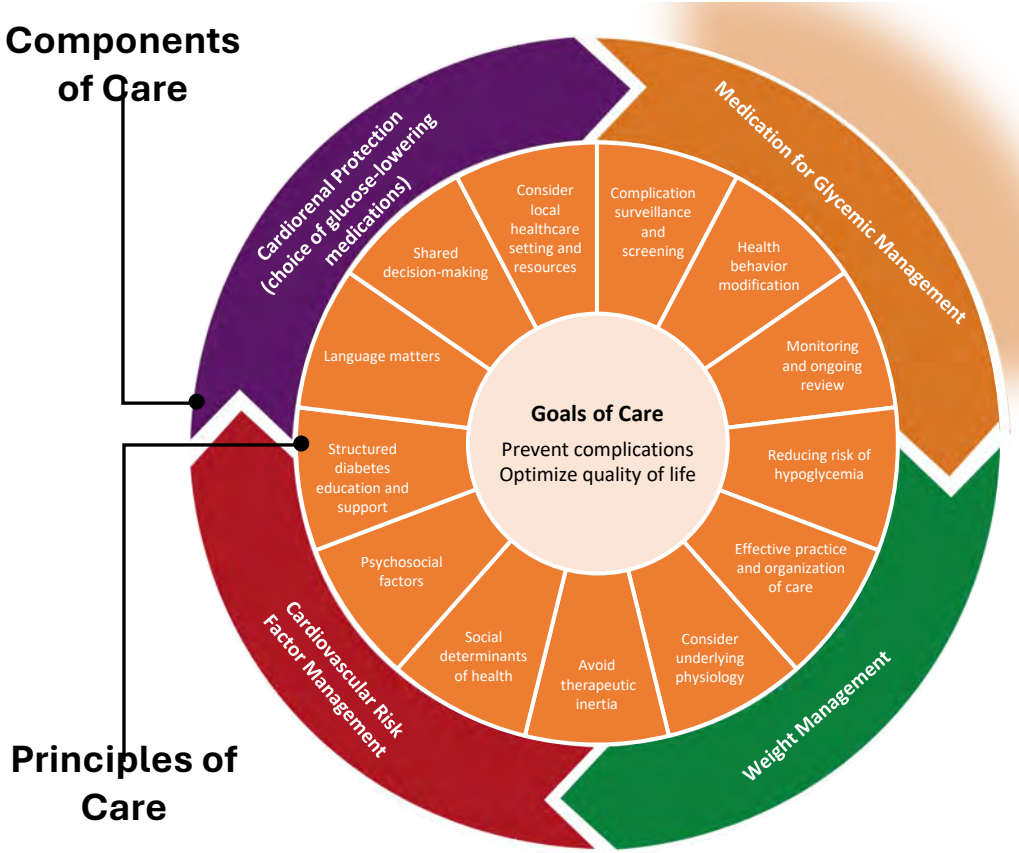
Early glucose-lowering therapy, regular assessment, and treatment intensification to achieve and maintain goals

Incorporation of SGLT2i and/or GLP-1 RA (oral vs injectable) in those with established/high risk of ASCVD

Goal of reducing microvascular and macrovascular complications

1. Khunti K, Aroda VR. *Diabetes Care*. 2022;45:766-768.

ADA Standards: Holistic Person-Centered Approach to T2DM Management[1,2]



Glycemic Management

Choose approaches that provide the efficacy to achieve and maintain goals

- Metformin OR agent(s) including COMBINATION therapy that provide adequate EFFICACY to achieve and maintain treatment goals
- Prioritize avoidance of hypoglycemia in high-risk individuals

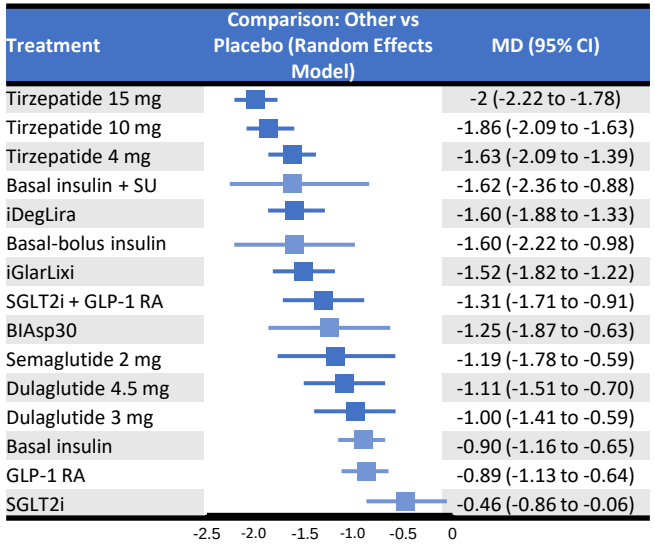
- In general, higher efficacy approaches have greater likelihood of achieving glycemic goals

Efficacy for Glucose Lowering	
Very High	**Dulaglutide (high dose), semaglutide, tirzepatide**, insulin, combination oral, combination injectable **(GLP-1 RA/insulin)**
High	**GLP-1 RA (not listed above)**, metformin, pioglitazone, SGLT2i, sulfonylurea
Intermediate	DPP-4i

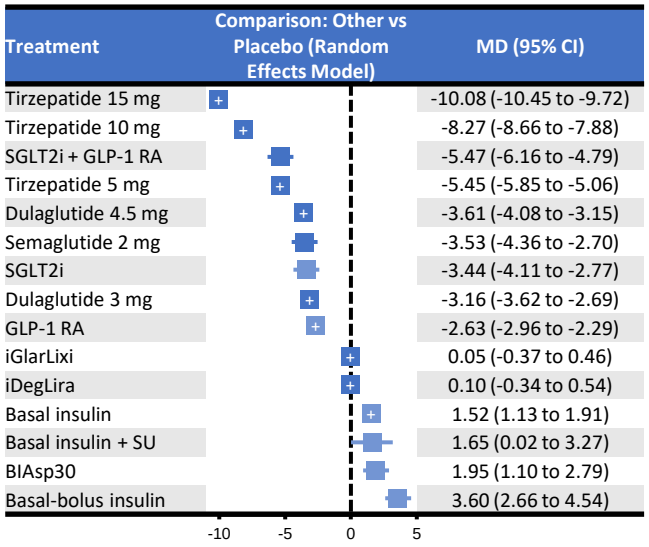
1. Davies MJ et al. *Diabetes Care.* 2022;45:2753-2786.
2. American Diabetes Association Professional Practice Committee. *Diabetes Care*. 2025;48(suppl 1):S181-S206.

Comparative Efficacy: Differential Effects of Various Glucose-Lowering Agents for T2DM[1]

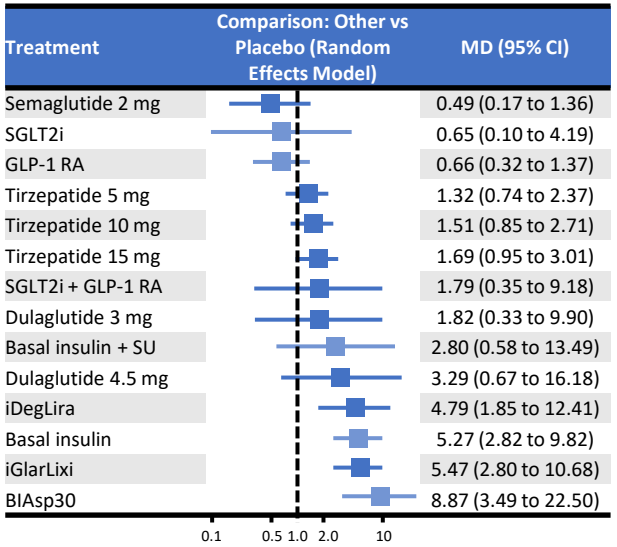
Change in A1C, %



Change in Body Weight, kg



Hypoglycemia <70 mg/dL



This meta-analysis of 40 trials concludes with the following hierarchy of treatment options:
tirzepatide, then **GLP-1 RA + basal insulin FRC,** then **GLP-1 RA + SGLT2i**

***NOTE**: The GLP-1 RAs have emerged as the <u>most effective</u> noninsulin glucose-lowering oagents in T2DM*

1. Caruso I et al. *eClinicalMedicine*. 2024;64:102181.

Established Clinical Benefits of GLP-1 Therapy in Diabetes: Helpful Tools for Optimal Benefit

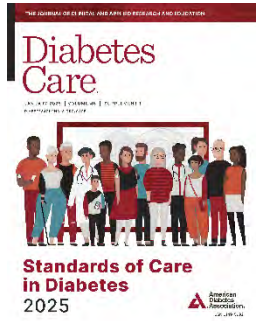
Documented Clinical Benefits

- Robust lowering of A1C
- Consistent weight reduction
- Effects on eating behaviors
- Lowering of BP
- Simplicity of dosing
- Protective CV effects
- Protective renovascular effects
- Reduction of liver fat
- Reduction of liver fibrosis

Helpful Tools to Facilitate Benefits

- **Effective, reliable monitoring of effects utilizing newer technology**
- Appropriate education on expectations
- Effective evaluation of any adverse events
- Careful attention to need for escalation and dose monitoring
- Plan & strategy for access

Place of Diabetes Technology in T2D: ADA and EASD Recommendations



- Technology can be useful in people with type 2 diabetes, but needs to be part of an holistic plan of care and supported by DSMES.

- Recommend real-time CGM (rtCGM) or intermittently scanned CGM (isCGM) for diabetes management to youth and adults with diabetes on any type of insulin therapy.

- Consider using rtCGM and isCGM in adults with type 2 diabetes treated with glucose-lowering medications other than insulin to achieve and maintain individualized glycemic goals.

- In circumstances when consistent use of CGM is not feasible, consider periodic use of personal or professional CGM to adjust medication and/or lifestyle.

Davies MJ, Aroda VR, Collins BS, Gabbay RA, Green J, Maruthur NM, Rosas SE, Del Prato S, Mathieu C, Mingrone G, Rossing P, Tankova T, Tsapas A, Buse JB Diabetes Care 2022; https://doi.org/10.2337/dci22-0034. Diabetologia 2022; https://doi.org/10.1007/s00125-022-05787- Joint Consensus Report ADA/EASD 2022—Management of Hyperglycemia in Type 2 Diabetes

Professional Practice Recommendations, Diabetes Care Volume 48, Supplement 1, January 2025

How CGM has Changed Management of Diabetes

DexCom G5

dexcom + verily

G6

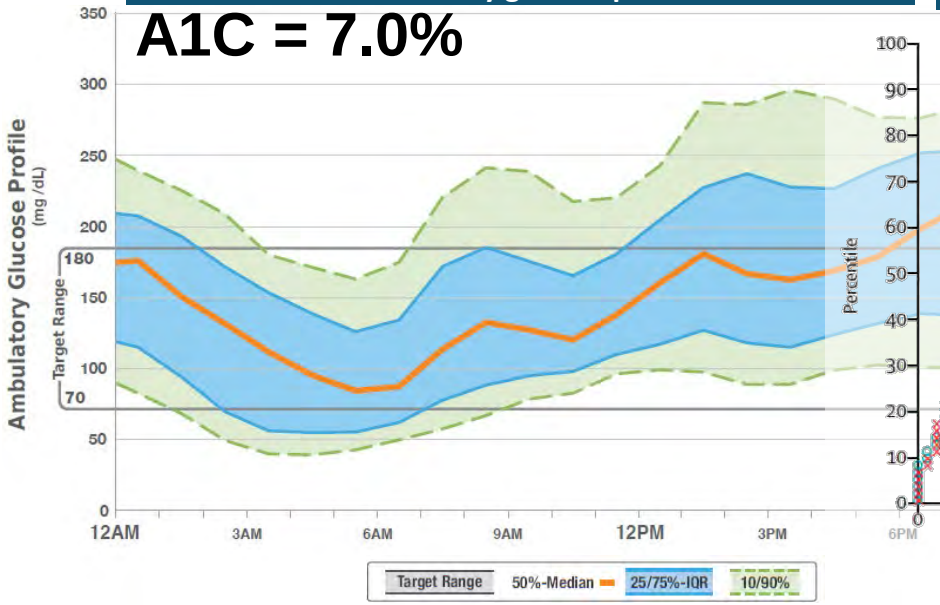
April, 2018

Abbott FreeStyle Libre

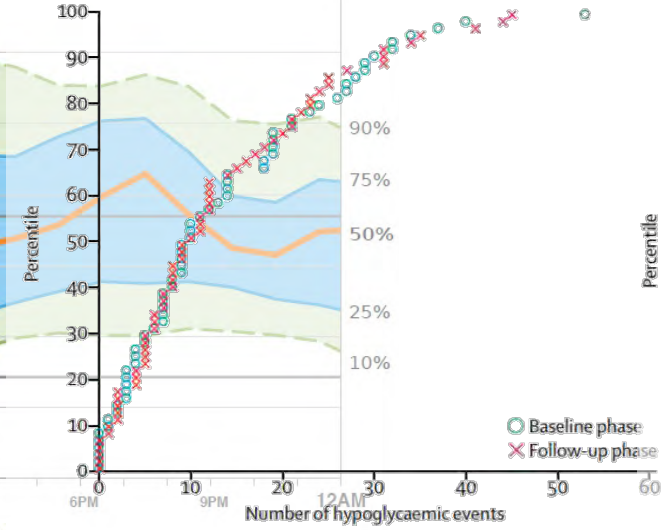
Eversense XL CGM Senseonics 2018

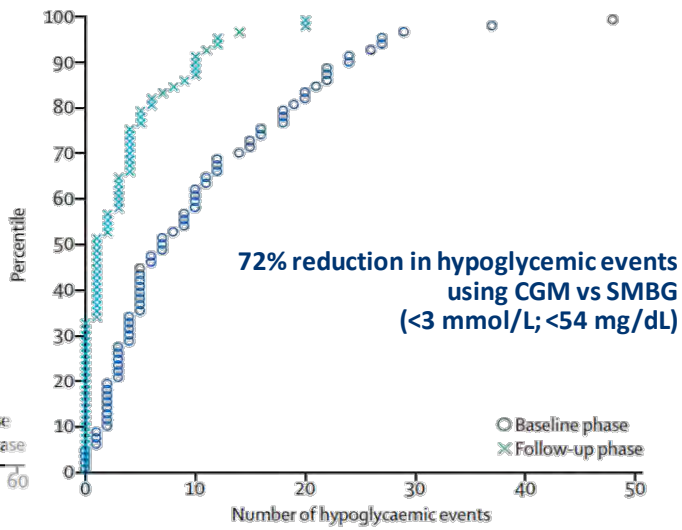
Medtronic Guardian Connect CGM (March, 2018)

Ambulatory glucose profile



The HypoDE study (baseline vs intervention)





72% reduction in hypoglycemic events using CGM vs SMBG (<3 mmol/L; <54 mg/dL)

Heinemann L, et al. Lancet 2018;391:1367–77.

AGP Report

Name

MRN

GLUCOSE STATISTICS AND TARGETS

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

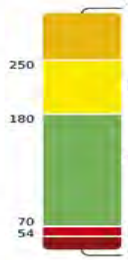
Glucose Ranges	**Targets** [% of Readings (Time/Day)]
Target Range 70–180 mg/dL	Greater than 70% (16h 48min)
Below 70 mg/dL	Less than 4% (58min)
Below 54 mg/dL	Less than 1% (14min)
Above 180 mg/dL	Less than 25% (6h)
Above 250 mg/dL	Less than 5% (1h 12min)

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%

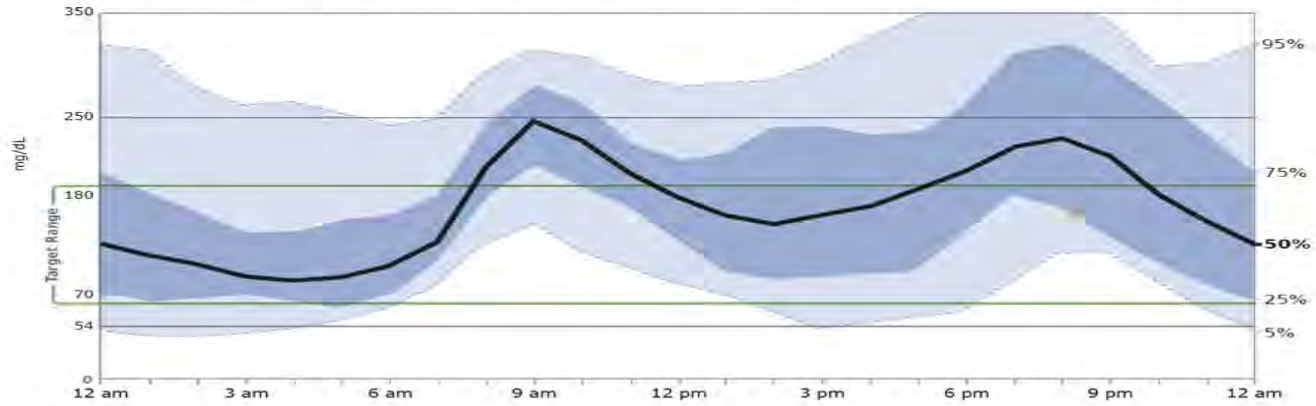
TIME IN RANGES



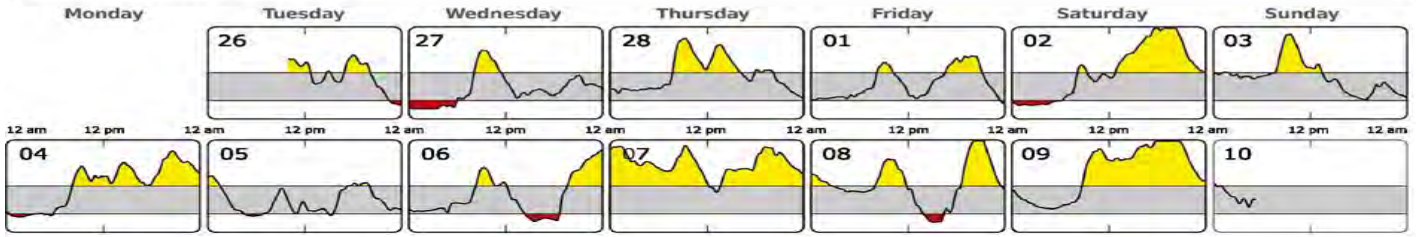
- **Very High** (>250 mg/dL) **20%** (4h 48min)
- **High** (181–250 mg/dL) **23%** (5h 31min)
- **Target Range** (70–180 mg/dL) **47%** (11h 17min)
- **Low** (54–69 mg/dL) **4%** (58min)
- **Very Low** (<54 mg/dL) **6%** (1h 26min)

AMBULATORY GLUCOSE 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



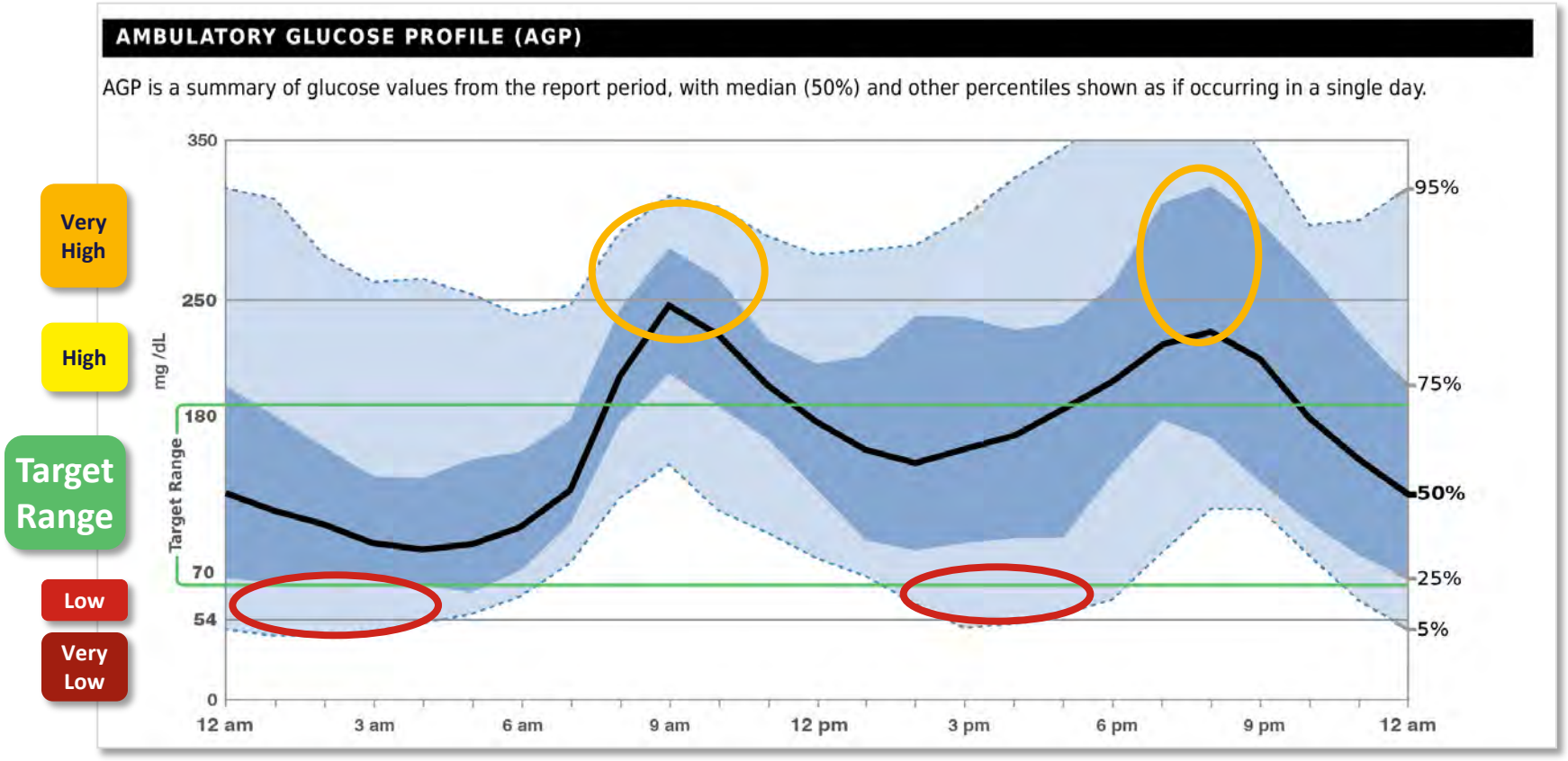
Each daily profile represents a midnight-to-midnight period.

Tadej Battelino et al. Dia Care 2019;42:1593-1603

American Diabetes Association.

AGP Report

New Tool to detect where is the problem? Also, to assess impact of intervention(s)!



http://www.agpreport.org/agp/agpreports

With Emergence of CGM, It's Time to Move On…

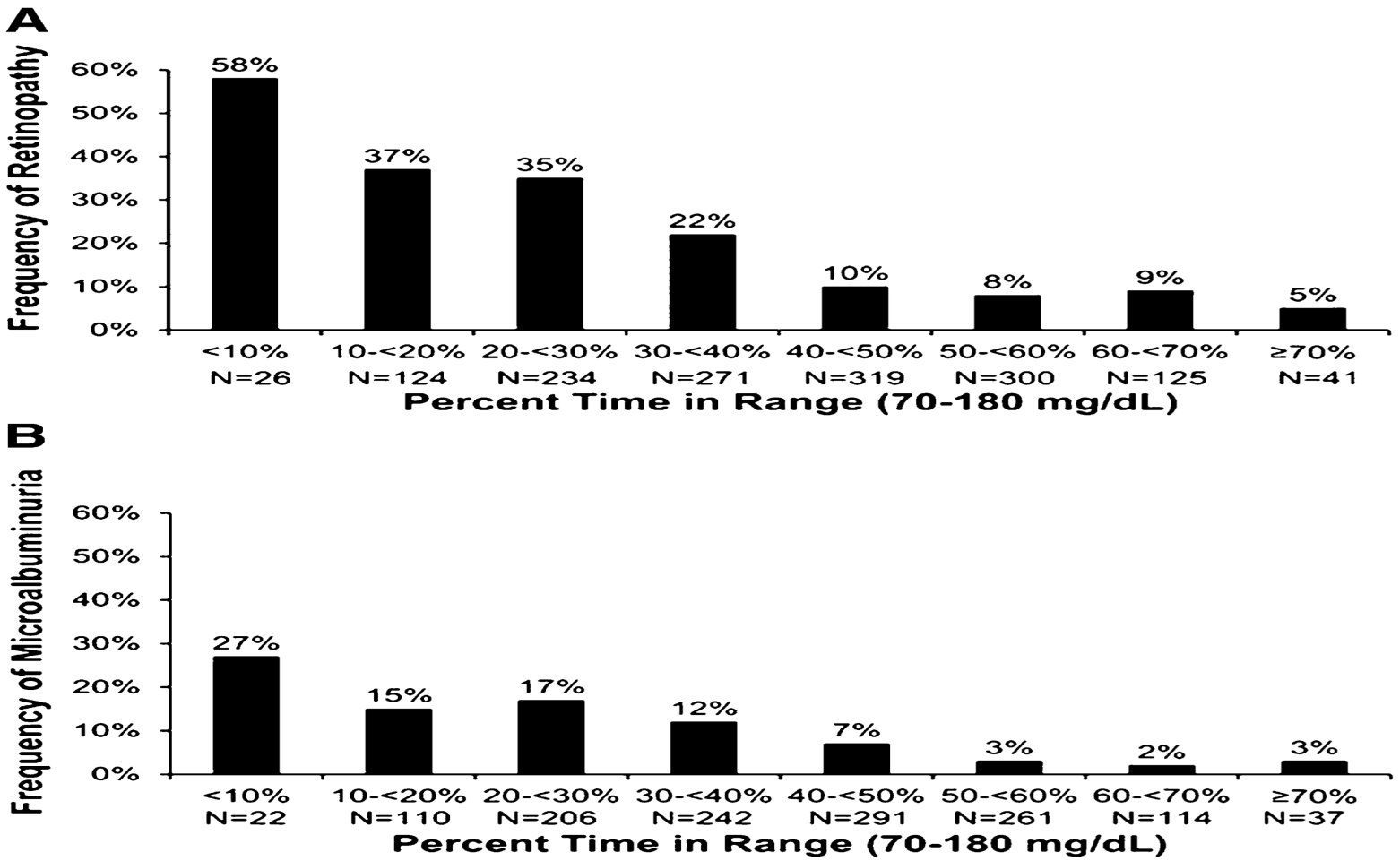
A1C

TIR

"TIR goes beyond A1C in representing blood glucose levels because it captures variation – the highs, lows, and in-range values that characterize life with diabetes"

TIR, time in range; diatribe https://diatribe.org/about-diatribe

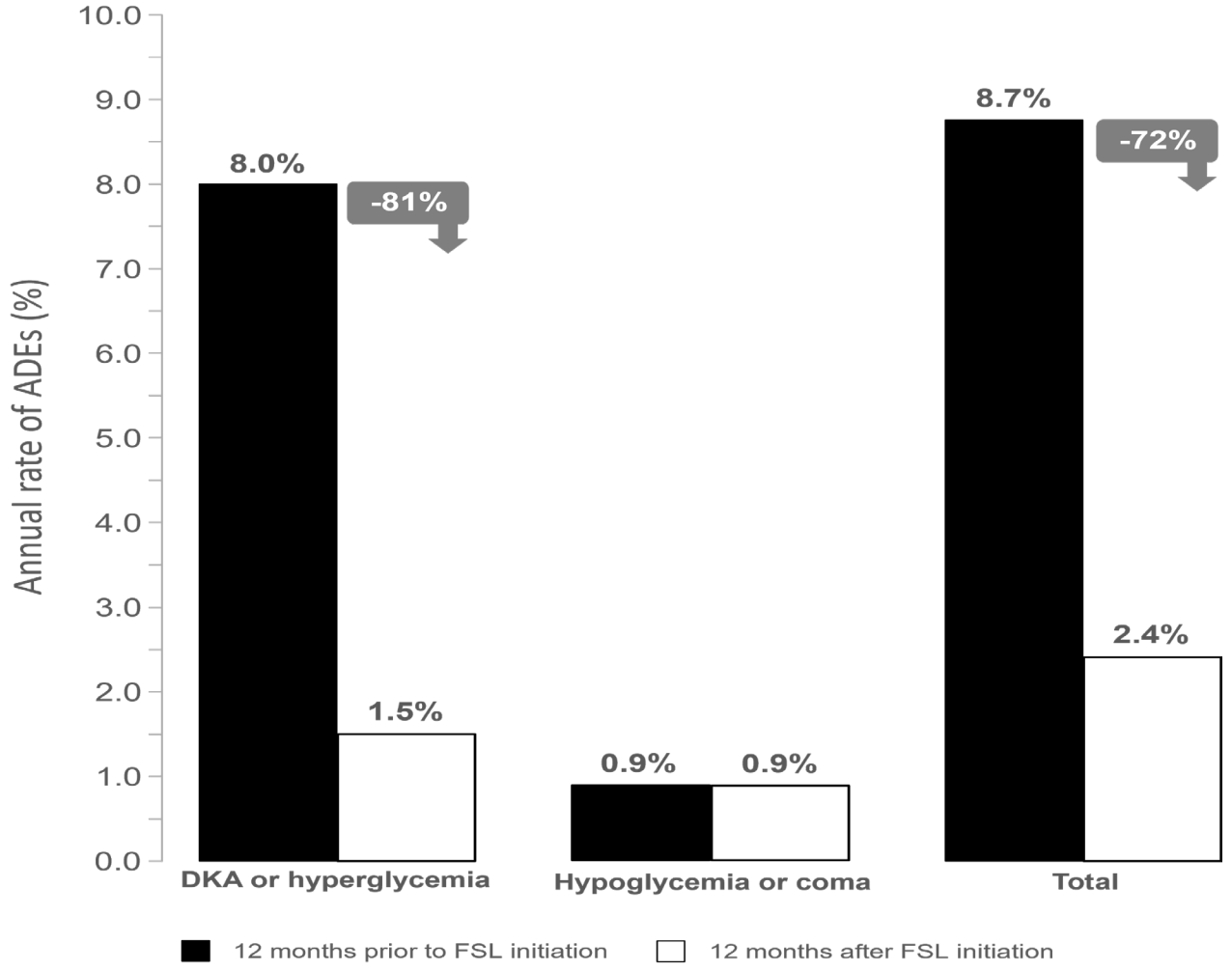
Validation of Time in Range as an Outcome Measure for Diabetes Clinical Trials



W. Beck, Richard M. Bergenstal, Tonya D. Riddlesworth, Craig Kollman, Zhaomian Li, Adam S. Brown, and Kelly L. Close Diabetes Care 2019;42:400–405 | https://doi.org/10.2337/dc18-1444

Reduced Rate of Hospitalizations for Acute Diabetes Events Before and After CGM Initiation in People with T2D on Insulin-Secretagogue Oral Drug Therapy in France

Hospital admission rates for acute diabetes events in people with T2D treated with oral insulin-secretagogue drugs in the 12 months before and after initiation of CGM



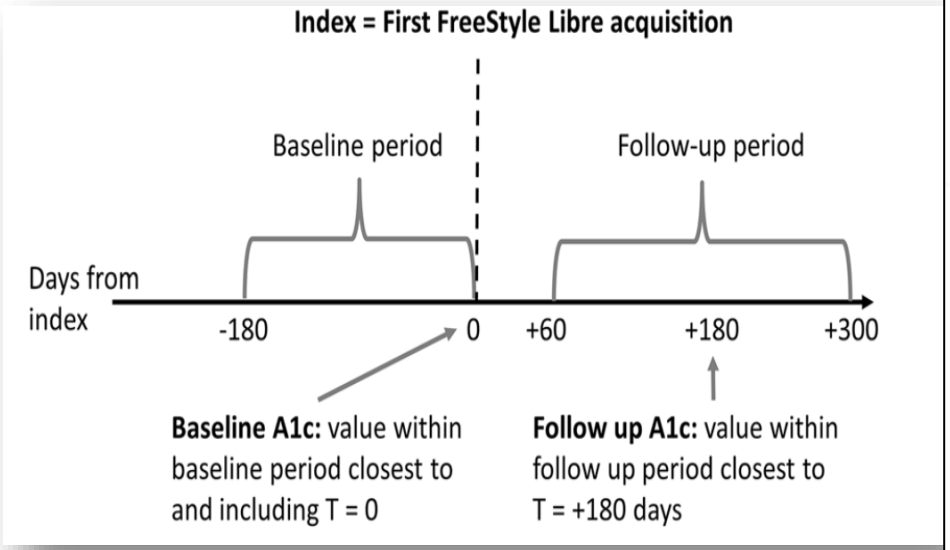
Guerci B, et al. ADA 2024

While CGM Use Supports Better Outcomes Even With the Use of *Less-effective Drugs* in T2DM—What is the Effect of CGM on a Background of GLP-1R Agonists?

Initiating CGM In People

Population n = 1,454 T2D sub-optimal controlled (HbA1c ≧ 8%, prior GLP-1 RA

Retrospective, RWE, observational study
Data source: Optum's de-identified Market Clarity



ORIGINAL RESEARCH

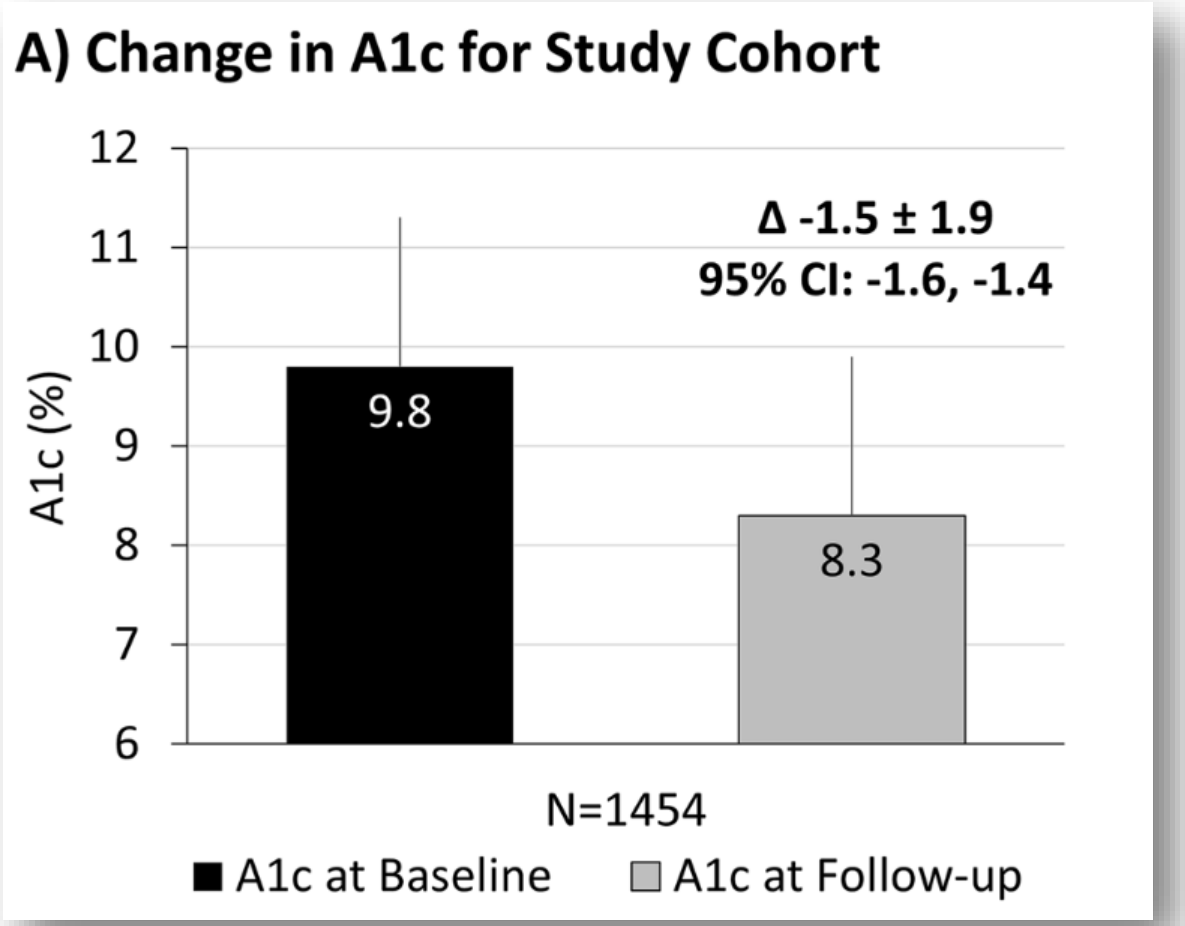
Association of Changes in A1C Following Continuous Glucose Monitoring Acquisition in People with Sub-Optimally Treated Type 2 Diabetes Taking GLP-1 RA Therapy

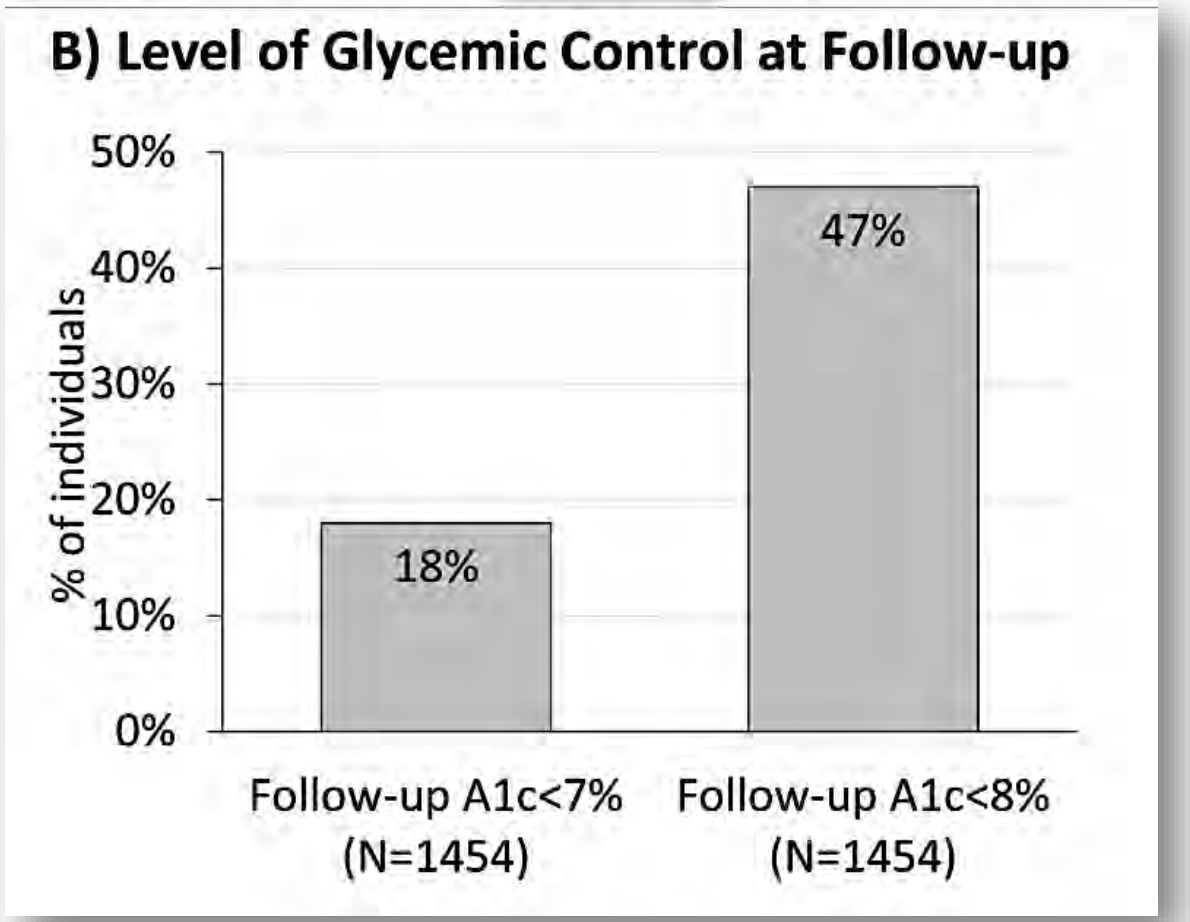
ABSTRACT

Miller et al., Diabetes Ther (2024) 15:2027–2038 https://doi.org/10.1007/s13300-024-01619-1

Place of CGM on a Background of GLP-1R Agonists

Better Glycemic Control with *Intiation of CGM*

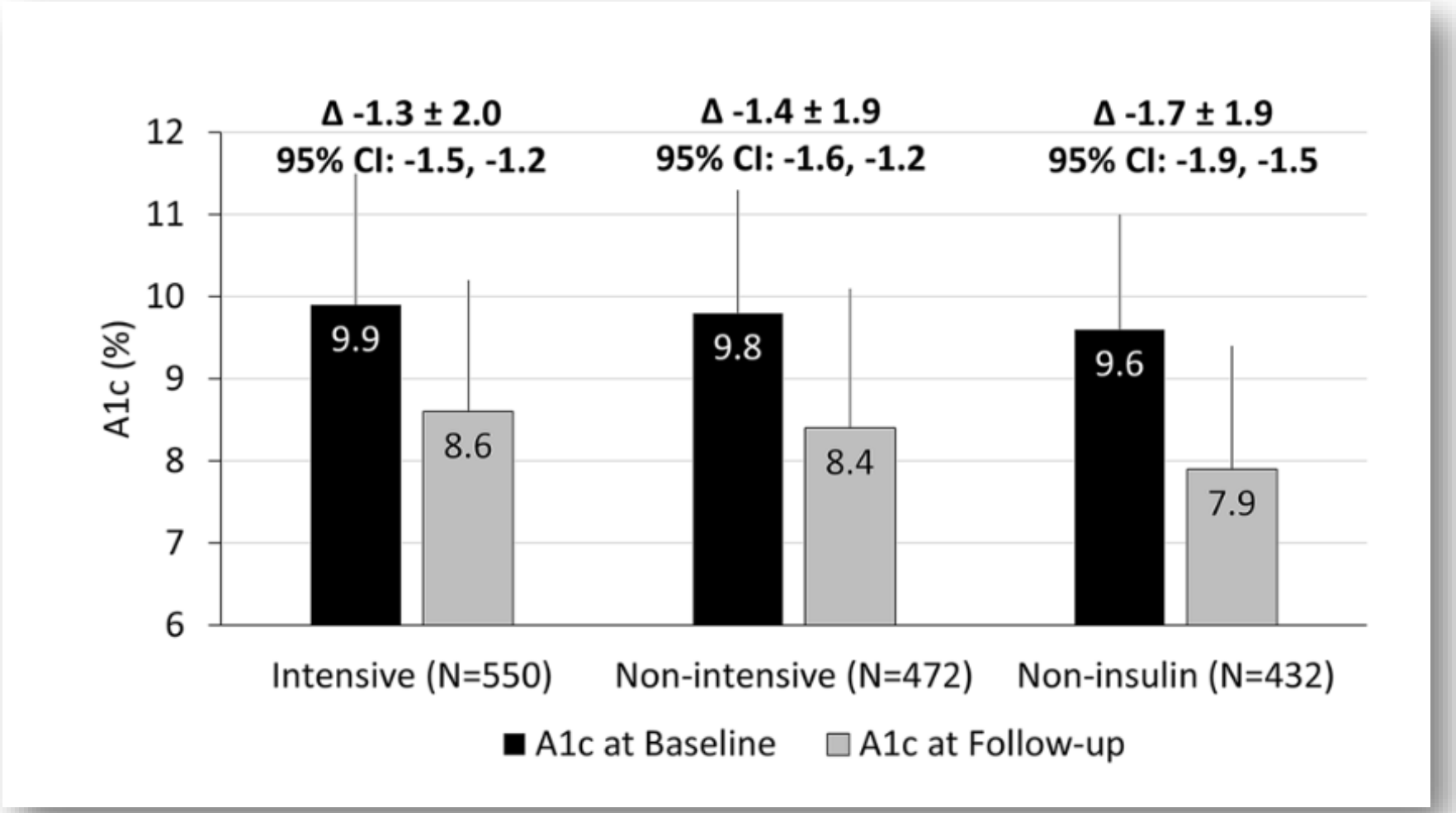




Miller et al., Diabetes Ther (2024) 15:2027–2038 https://doi.org/10.1007/s13300-024-01619-1

Place of CGM on a Background of GLP-1R Agonists

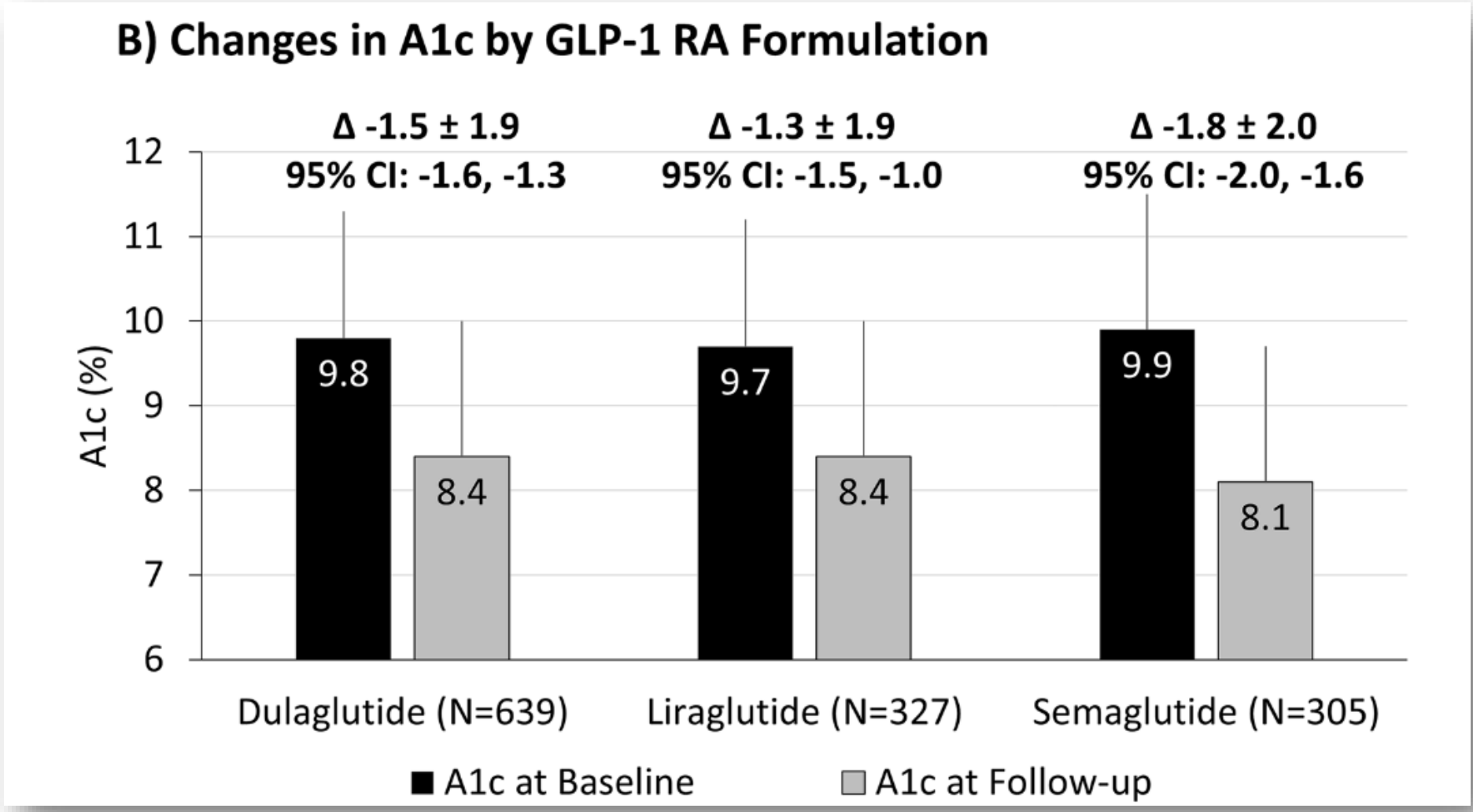
Effects are Consistent in T2D Taking GLP-1RA Together with *Different Insulin Regimens*



Miller et al., Diabetes Ther (2024) 15:2027–2038 https://doi.org/10.1007/s13300-024-01619-1

Place of CGM on a Background of GLP-1R Agonists

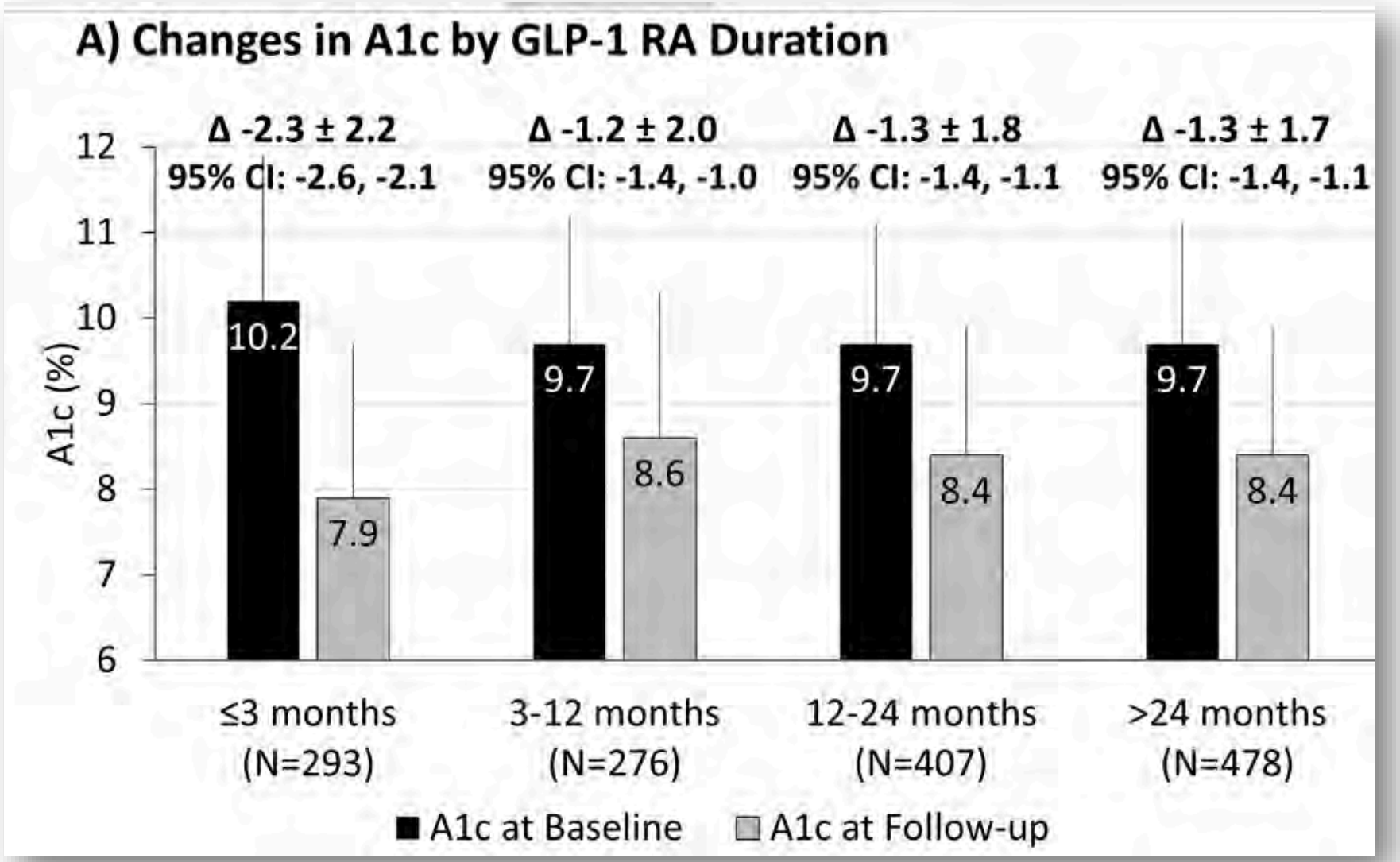
Change in HbA1c by GLP1RA *Formulation*



Miller et al., Diabetes Ther (2024) 15:2027–2038 https://doi.org/10.1007/s13300-024-01619-1

Place of CGM on a Background of GLP-1R Agonists

Change in HbA1c by *Duration* of GLP1RA Treatment



Miller et al., Diabetes Ther (2024) 15:2027–2038 https://doi.org/10.1007/s13300-024-01619-1

FRONTIER Study

Results

- 1,774 patients were included (GLP-1 RA ± lifestyle/oral glucose lowering therapy, 273; oral therapy only, 1,501).
- **After starting CGM, HbA1c was statistically significantly reduced in both groups,** with a larger mean reduction in the GLP-1 RA group than the oral therapy group (−0.56% vs. −0.27%).
- Overall, ED visits and hospitalization fell in both groups, with statistically significant reductions in the oral therapy group.
- Lower trends were seen for ED visits and hospitalization with DKA and hypoglycemia.
- For people with T2D aged >65 years on GLP-1 RA and/or oral therapy, initiation of CGM was associated with a **significant mean reduction in HbA1c**.

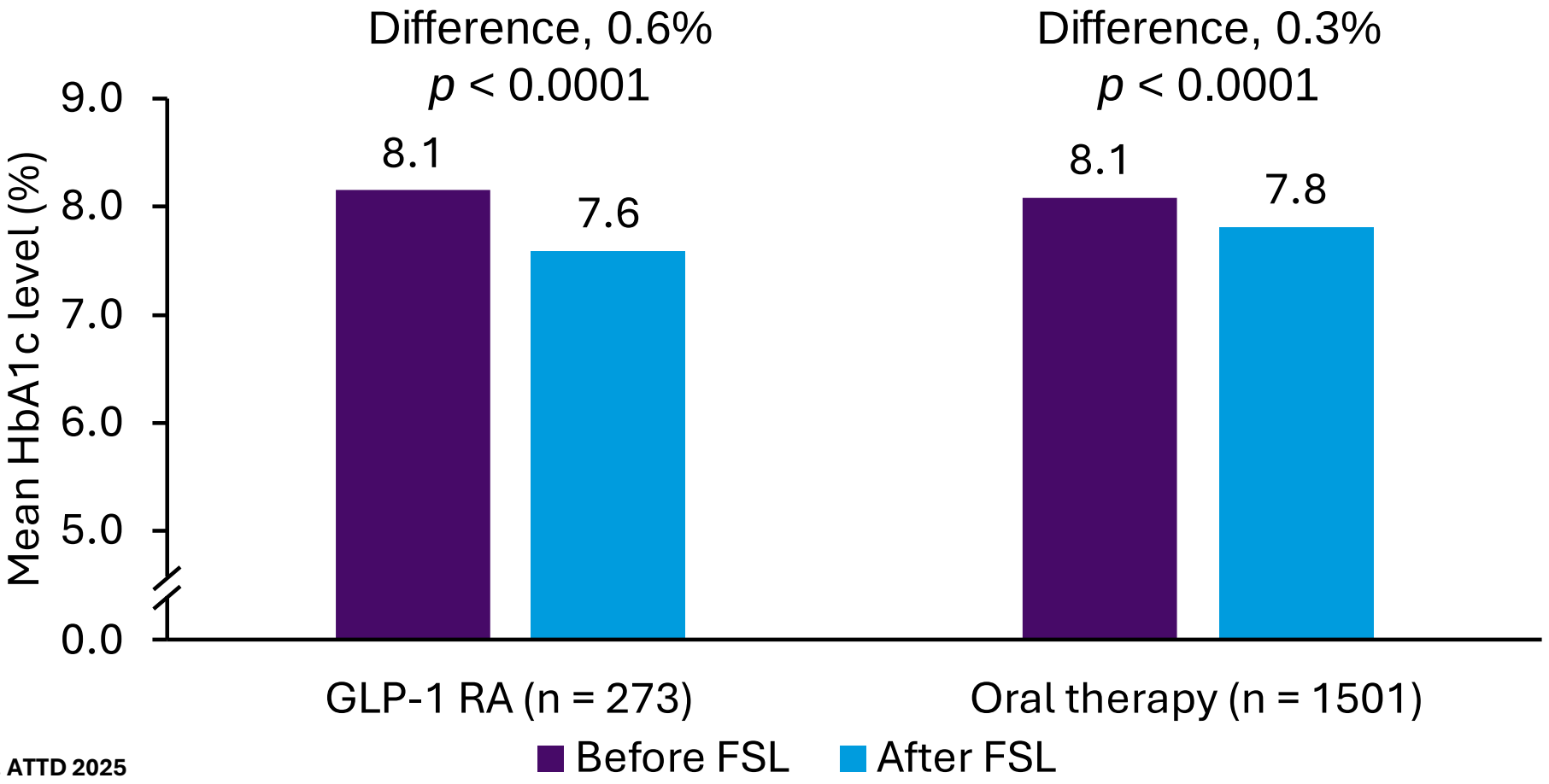
FRONTIER Study

This study investigated **healthcare resource utilization and HbA1c** at a population level **before and after CGM** adoption in people with T2D aged >65 years on **non-insulin therapie**s (GLP-1 RA and/or oral therapy).

FRONTIER Study

HbA1C Levels Before and After CGM

Mean HbA1c before and after starting FSL



Ratzki-Leewing A, et al. ATTD 2025

Interim Summary

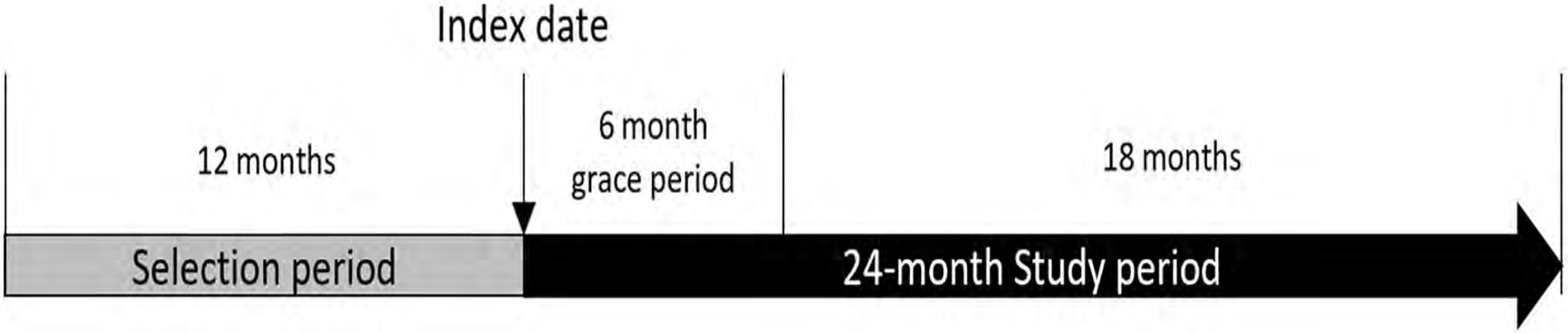
- Adults with T2D and prior GLP-1 RA therapy experienced **significant improvements** in HbA1c six (6) months **after initiating CGM**, irrespective of GLP-1 RA duration or GLP-1 RA formulation or insulin therapy type.

- Adults with sub optimally controlled T2D, initiating GLP-1 RA with CGM, had **greater improvement** in HbA1c compared with those treated with GLP-1 RA only.

Miller et al., Diabetes Ther (2024) 15:2027–2038 https://doi.org/10.1007/s13300-024-01619-1

Wright et al., Diabetes Technology & Therapeutics Vol. 26, No. 10. https://doi.org/10.1089/dia.2024.0015

Effect of CGM on Improving Therapeutic Inertia in T2DM



Canadian National Private drug claims database:
Approx 50% coverage of insured individuals in Canada

Harris et al., Diabetes Obesity Metabolism, Volume: 25, Issue: 6, Pages: 1704-1713, First published: 21 February 2023, DOI: (10.1111/dom.15025)

Effect of CGM on Reducing Therapeutic Inertia in T2DM

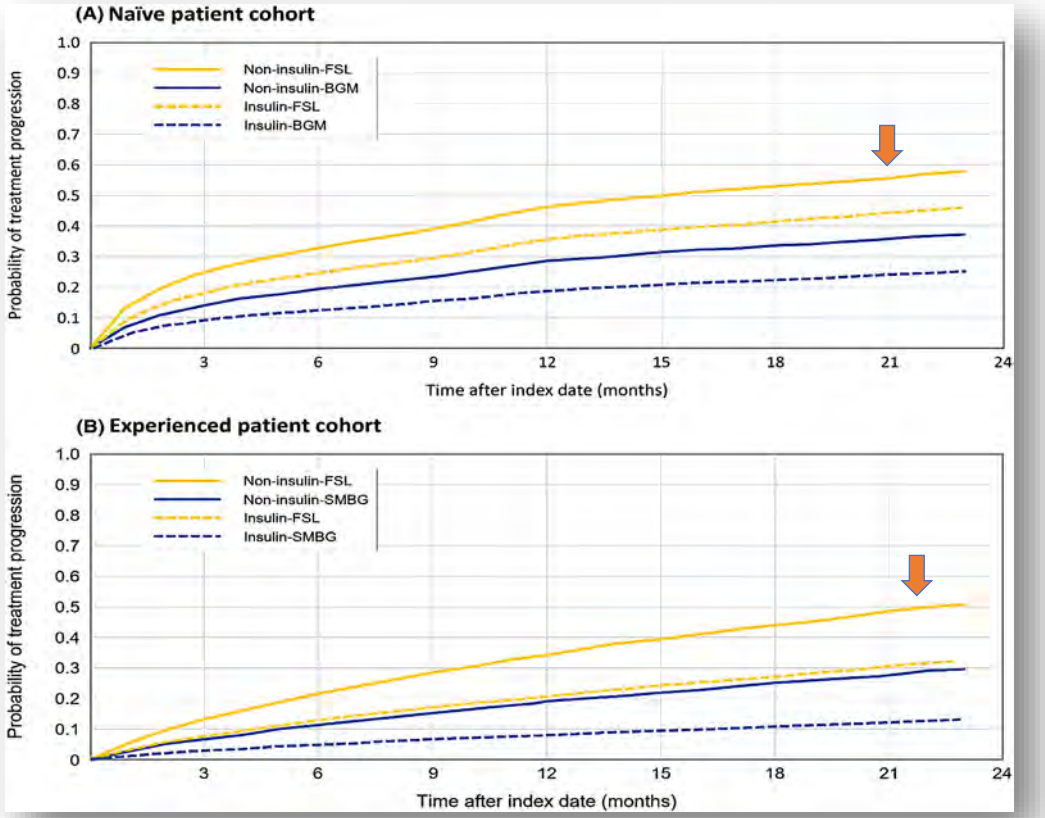
1. No diabetes drug therapy (glucose monitoring only; diet and exercise)
2. Monotherapy with non-insulin OADs
3. Dual therapy with non-insulin OADs
4. Triple therapy with non-insulin oral OADs
5. >3 non-insulin OADs
6. Injectable GLP-1 RA (±OADs)
7. Basal insulin therapy (±OADs)
8. MDI therapy (±OADs)

Naive Cohort: having no treatment and BGM during Selection Period

Experienced Cohort: being on treatment category 1-6 or on category 7

Harris et al., Diabetes Obesity Metabolism, Volume: 25, Issue: 6, Pages: 1704-1713, First published: 21 February 2023, DOI: (10.1111/dom.15025)

Effect of CGM on Reducing Therapeutic Inertia in T2DM



PwT2D using CGM had a greater probability for treatment progression. Thus, CGM may be useful to reduce therapeutic inertia and promote treatment progression in PwT2D

***NOTE**: The patients using BGM showed significantly-reduced likelihood of treatment progression compared to those utilizing CGM*

Association of Continuous Glucose Monitoring Utilization and GLP-1 Receptor *Agonist Discontinuation*

- Matched 878 consistent CGM users with 3512 non-CGM users.
- One year post GLP-1 initiation, 31.1% of consistent CGM users discontinued GLP-1, compared to 48.4% of non-CGM users.
- After adjusting for covariates, consistent **CGM users were significantly less likely to discontinue GLP-1** compared to non-CGM users.
- This study suggests that regardless of therapy type, **consistent CGM use is associated with a significantly lower risk of GLP-1 discontinuation, potentially enhancing adherence, and improving long-term glycemic control** in people living with T2D on non-intensive therapy.

Huang E, Bindal A. ATTD 2025

Methods

This retrospective matched-cohort study analyzed data from administrative claims in adults ≥18 years old, diagnosed with T2D, on basal insulin or non-insulin therapy, **and CGM-naïve before starting GLP-1.**

Summary and Key Takeaways

- While GLP-1 RAs have been shown to be highly-effective agents in the management of PwT2DM, their effectiveness is highly dependent on consistency of use and adequacy of monitoring of their therapeutic impact
- Adults with T2D and prior GLP-1 RA therapy experienced significant improvements in HbA_{1c} 6 months after initiating CGM (FSL), irrespective of GLP-1 RA duration or GLP-1 RA formulation or insulin therapy type.
- In adults with suboptimal control T2D on other agents , initiating GLP-1 RA with CGM (FSL), resulted in greater improvement in HbA_{1c} compared with those treated with GLP-1 RA using BGM.
- Use of CGM has been shown to reduce therapeutic inertia in T2DM
- Greater adherence and fewer discontinuations of GLP-1 therapy are facilitated with use of CGM

The Profound Positive Impact of CGM on Glycemic Control and Patient Engagement

Eden Miller, DO D-ABOM D-ACD
Founder, Diabetes and Obesity Care LLC
Bend, OR

Disclosures

Eden Miller has disclosed the following financial relationships:

- Advisor: Abbott, Boehringer Ingelheim, Eli Lilly, Embecta, Insulet, Novo Nordisk
- Speaker: Abbott, Bayer, Boehringer Ingelheim, Corcept, Eli Lilly, Embecta, Insulet, Novo Nordisk, Sanofi
- Contracted Research: Abbott

All relevant financial relationships and potential conflicts of interest have been mitigated.

Continuous Glucose Monitoring

Equips us as health care practitioner
to share in the journey
as patients become experts on their own disease

Factors That Have a "Big Impact" on Daily Life With Diabetes[a]

Type 1 Diabetes		Type 2 Diabetes on Insulin		Type 2 Diabetes Not on Insulin	
Food choices	63%	Food choices	67%	Food choices	64%
Time in range	57%	Time in range	45%	Time in range	41%
		HbA1c	44%	HbA1c	41%
Unexpected blood glucose numbers	42%	Nondiabetes health issues	36%	Nondiabetes health issues	31%
		Dosing insulin	34%		
Dosing insulin	37%	Unexpected blood glucose numbers	28%	Unexpected blood glucose numbers	20%
Hypoglycemia	30%	Symptoms of complications	24%	Symptoms of complications	15%
HbA1c	30%				
Nondiabetes health issues	27%				

- HbA1c, glycated hemoglobin.
- a. Numbers depict percentage of survey respondents within each group who scored a particular factor (eg, food choices) as having a "big impact" on daily life with diabetes. Survey respondents were asked to rate the impact of 9 factors on daily life with diabetes: a) A1c levels, b) dosing insulin (insulin users only), c) food choices, d) hypoglycemia, e) nondiabetes health issues, f) side effects of diabetes medications, g) symptoms of diabetes complications, h) time in range, and i) unexpected blood glucose numbers. The rating scale included the following options: No impact, A slight impact, A big impact, and Don't know.
- Runge AS, et al. Clin Diabetes. 2018;36:112-119.

Potential Drivers of a Positive Mindset[a]

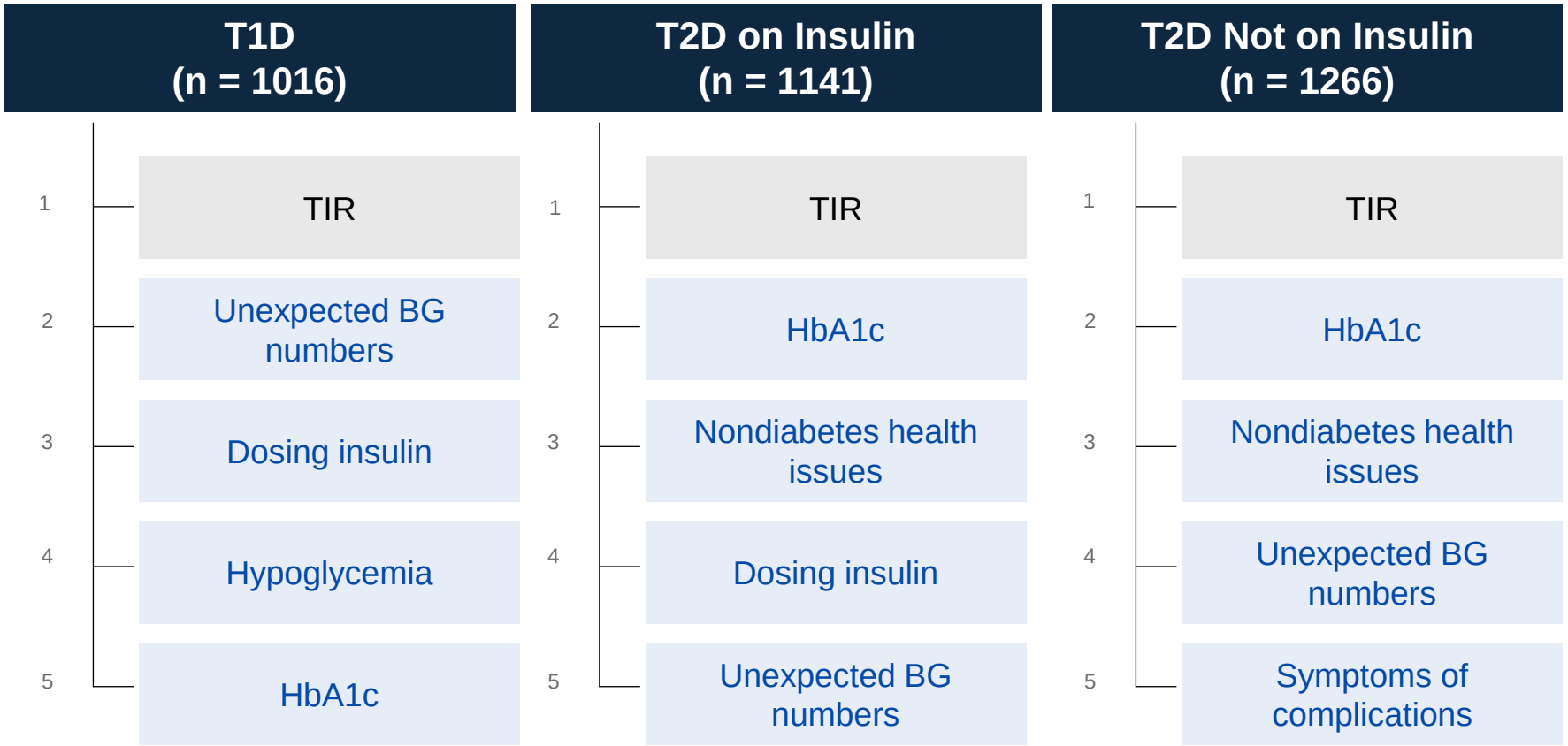
Type 1 Diabetes		Type 2 Diabetes on Insulin		Type 2 Diabetes Not on Insulin	
Your blood glucose numbers are on target all day	54%	Your blood glucose numbers are on target all day	36%	You take your diabetes medications exactly as prescribed	29%
You are relaxed and taking your diabetes in stride	15%	You take your diabetes medications exactly as prescribed	27%	Your blood glucose numbers are on target all day	22%
You get the exercise you need or want	14%	You are relaxed and taking your diabetes in stride	14%	You eat healthy food at every meal	18%

Table depicts the percentage of survey respondents within each group who ranked a particular statement as being most likely to put them in a positive frame of mind about their diabetes and health

- a. Participants were asked to select 3 items from the list, putting the most important on the top: You take your diabetes medications exactly as prescribed, Your blood glucose numbers are on target all day, You eat healthy food at every meal, You get the exercise you need or want, You are relaxed and taking your diabetes in your stride, and Other (please specify).
- Runge AS, et al. Clin Diabetes. 2018;36:112-119.

“A Big Impact” on Daily Life in Ranked Order
TIR is #1 for All

- 3455 online surveys
- 62% response rate
- Questions about
  - Success of current care
  - Priorities for diabetes care improvements
  - Diabetes' impact on quality of life
- > 1000 respondents from each of the 3 groups



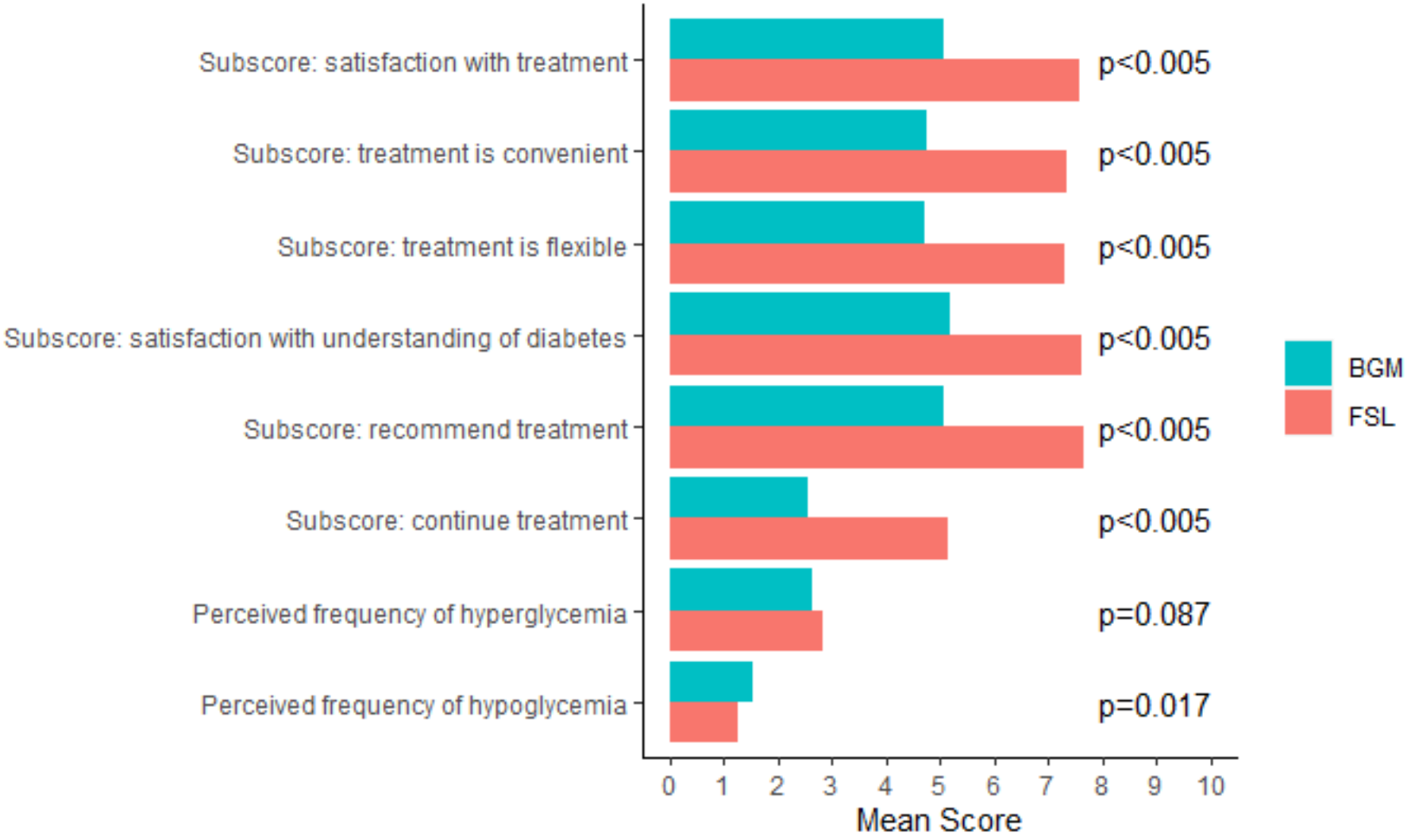
- BG, blood glucose; T1D, type 1 diabetes; T2D, type 2 diabetes; TIR, time in range.
- FDA. Accessed May 9, 2024. https://www.fda.gov/drugs/news-events-human-drugs/public-workshop-diabetes-outcome-measures-beyond-hemoglobin-a1c-hba1c

Association of CGM and Treatment Satisfaction Among Elderly Participants with Type 2 Diabetes

- This study included 267 elderly T2D adults (≥65 years). CGM usage was associated with a significant **increase in diabetes treatment satisfaction** (mean total DTS change score: +15.3, $p<0.005$), and the perceived frequency of **hypoglycemia was significantly less** after using CGM (mean score: -0.2, $p=0.017$) compared to using BGM.
- Furthermore, daily scan frequency was correlated with a **decrease in A1C**, where each additional scan was associated with a reduction of 0.036% in A1C (adjusted 95% CI: (-0.070, -0.003); adjusted $p=0.032$).
- **Conclusions**: Using CGM was associated with **significant improvement in diabetes treatment satisfaction among the elderly population with T2D**.

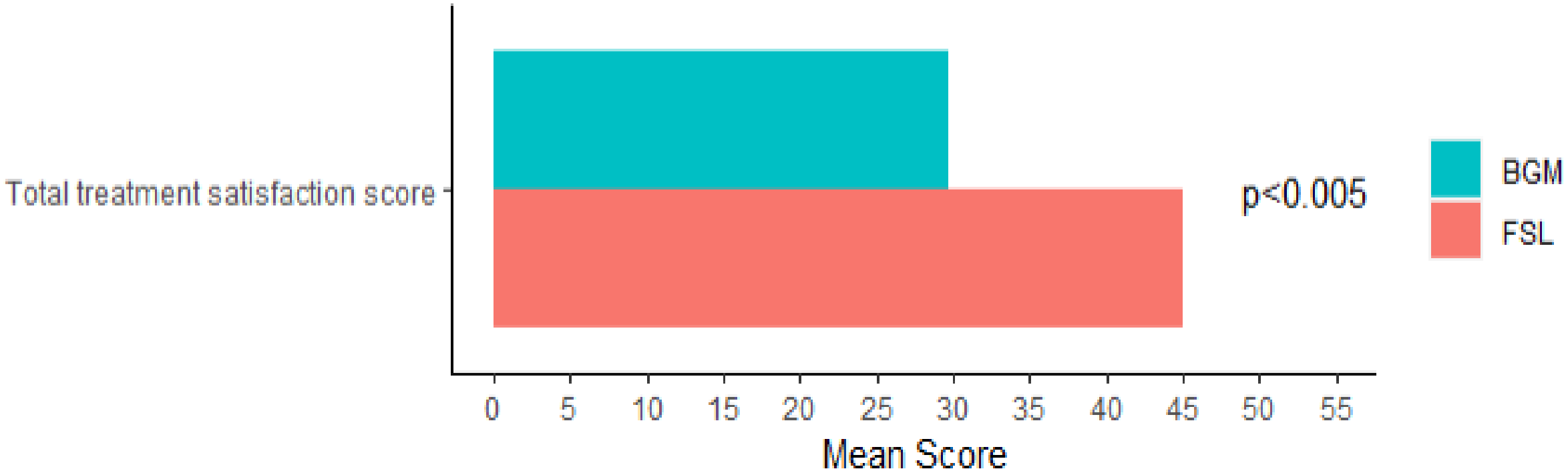
E. Huang, M. Nada, S. Alva presentation at ATTD 2023

Association of CGM Usage and Treatment Satisfaction Among Elderly Participants with Type 2 Diabetes



E. Huang, M. Nada, S. Alva presentation at ATTD 2023

Association of CGM Usage and Treatment Satisfaction Among Elderly Participants with Type 2 Diabetes



E. Huang, M. Nada, S. Alva presentation at ATTD 2023

Reduced Hospitalizations and Work Absenteeism

The FLARE study showed a decrease in hospitalizations and work absenteeism in both patients with T1D and patients with T2D (n=1365)*†[1]

66%

Reduction in hospital admissions[2]
from 13.7% to 4.7% at 12 months ($p<0.001$)

58%

Reduction in work absenteeism[2]
from 18.5% to 7.7% at 6 months ($p<0.05$)

6 months after getting CGM, T2D patients not on bolus insulin saw a 30% reduction in acute diabetes events†[3]

1. Fokkert, Marion, et al. "Improved Well-Being and Decreased Disease Burden After 1-Year Use of Flash Glucose Monitoring (FLARE-NL4)." *BMJ Open Diabetes Research & Care* 7, no. 1 (December 2019): e000809. https://doi.org/10.1136/bmjdrc-2019-000809. **2.** Data on file. Abbott Diabetes Care.
3. Miller, Eden, Laura Brandner, and Eugene Wright, Jr. "84-LB: A1C Reduction After Initiation of the FreeStyle Libre System in Type 2 Diabetes Patients on Long-Acting Insulin or Noninsulin Therapy." *Diabetes* 69(suppl 1)(June 2020). https://doi.org/10.2337/db20-84-LB.

HbA1c Reduction After Initiation of CGM in Type 2 Diabetes Patients on Long-Acting Insulin or Non-Insulin Therapy[1]

Aim:

- Evaluate the change in HbA1c from baseline to 6mo and baseline to 12mo after starting a CGM system f T2D patients on long-acting insulin (LAI) and non-insulin (including GLP-1) therapy

Methods:

- Retrospective, observational analysis of deidentified data
- Data from three different data sets were used and linked together during the analysis timeframe
- *LibreView ®*: Index was the first date of data in LibreView (Nov 2017–Sept 2019)
- *Quest Diagnostics™ :* HbA1c testing results
- *Decision Resources Group (DRG):* Medication and diagnosis derived from DRG

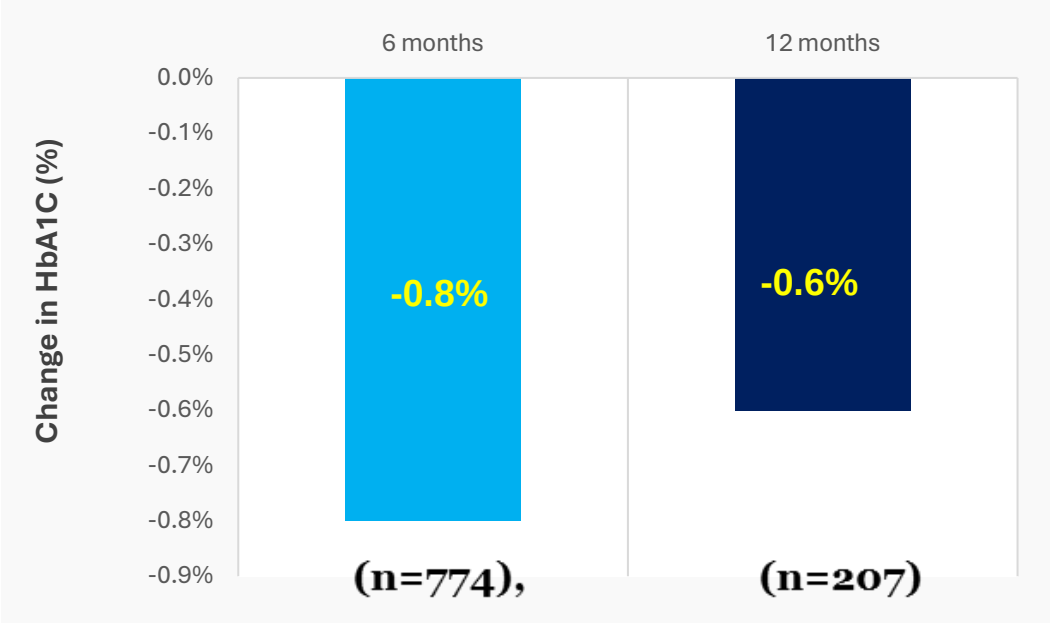
Inclusion criteria:

- Baseline A1c must be ≥ 6.5% within 6mo prior to index
- HbA1c tests closest to +180 days (+150-210) used for 6mo
- HbA1c tests closest to +360 days (+330-390) used for 12mo

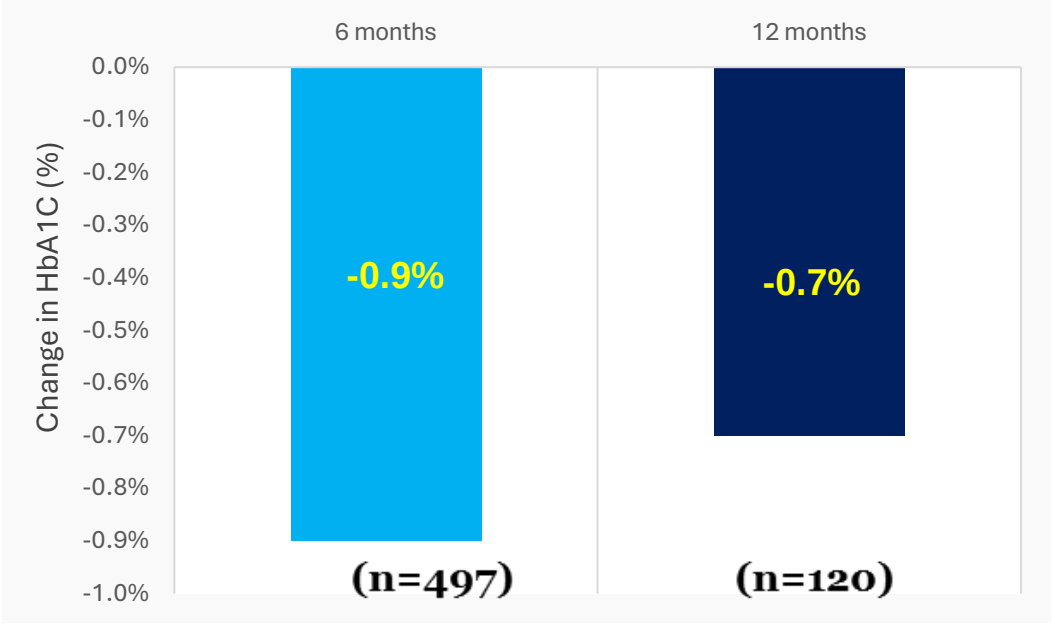
1. Miller E et al. [84-LB]. Poster presented at: American Diabetes Association 80th Scientific Session; June 12-16, 2020;Virtul.

HbA1c Reduction After Initiation of CGM in Type 2 Diabetes Patients on Long-Acting Insulin or Non-Insulin Therapy[1]

Reduction in A1c after FreeStyle Libre initiation was seen in all type of patients
(p<0.0001)



The greatest reduction in A1c was seen in the T2D non-insulin group
(p<0.0001)



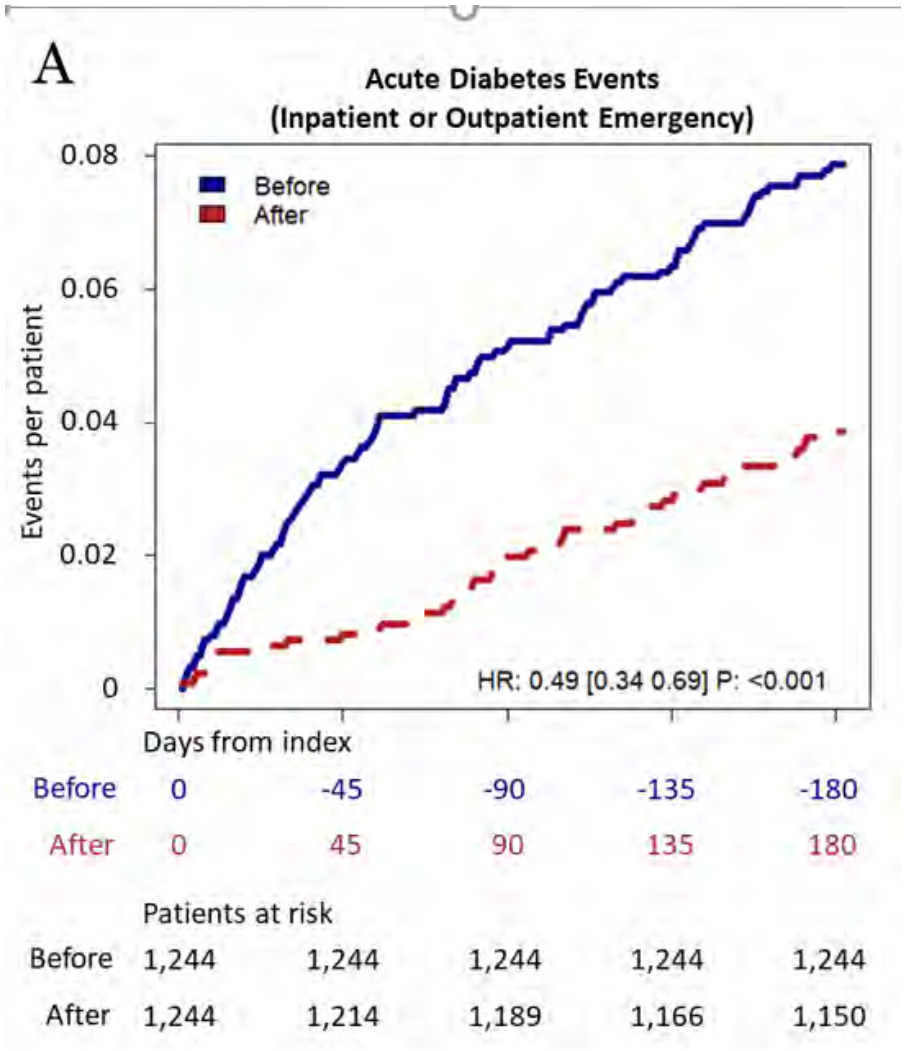
1. Miller E et al. [84-LB]. Poster presented at: American Diabetes Association 80th Scientific Session; June 12-16, 2020;Virtul.

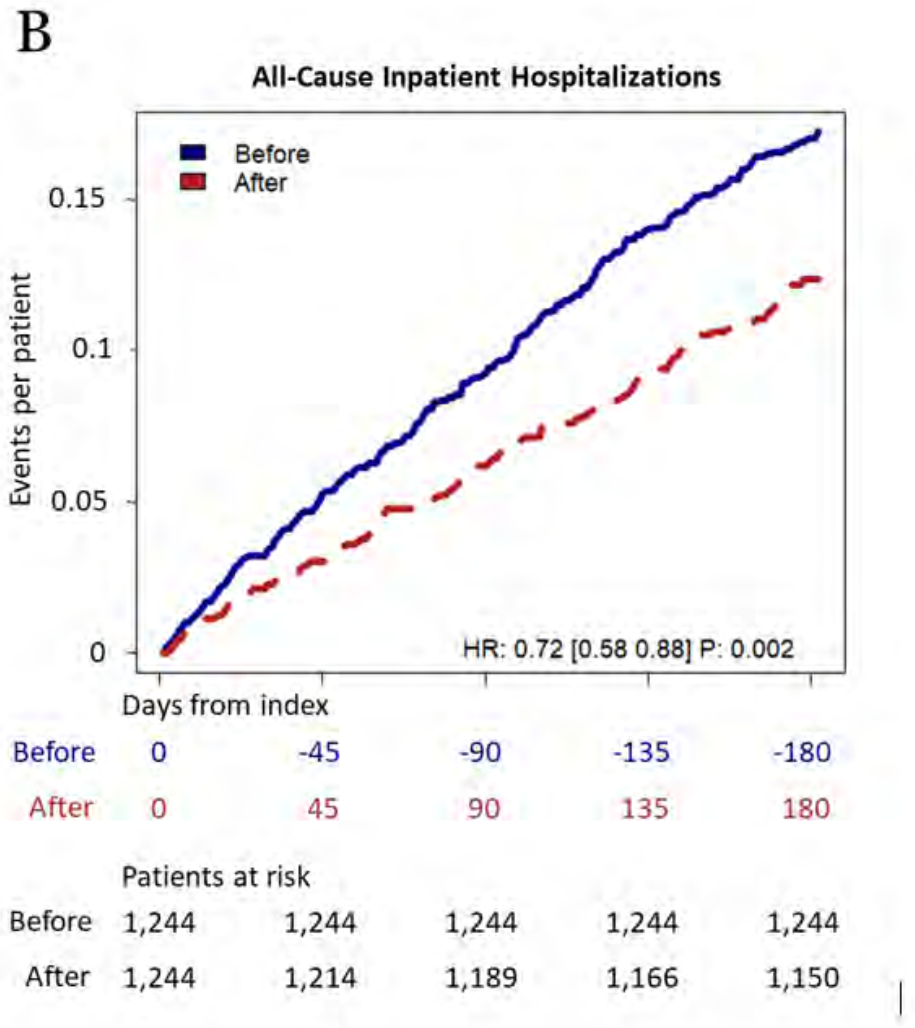
Impact ADE's and CGM

- 69-OR presented June 13, 2020 at 9:30
- IBM MarketScan™ Commercial Claims and Medicare Supplemental databases were used in this retrospective, observational analysis
- MarketScan contains insurance billing claims for inpatient, outpatient, and pharmacy expenses.
- Observed outcomes with Freestyle Libre
- Inclusion: de novo purchase of FSL in 2017 Q4–2018 Q2, diagnosis of *T2D*, ≥18 years old, using basal/bolus insulin
- Primary outcome: acute diabetes events (ADE)-hospitalization with hyper-/hypoglycemia as the primary diagnosis or outpatient emergency visit associated with a code of hyper-/hypoglycemia.

Bergenstal RM, et al: ADA 2020, 69-OR

The Impact of FSL on ADE's



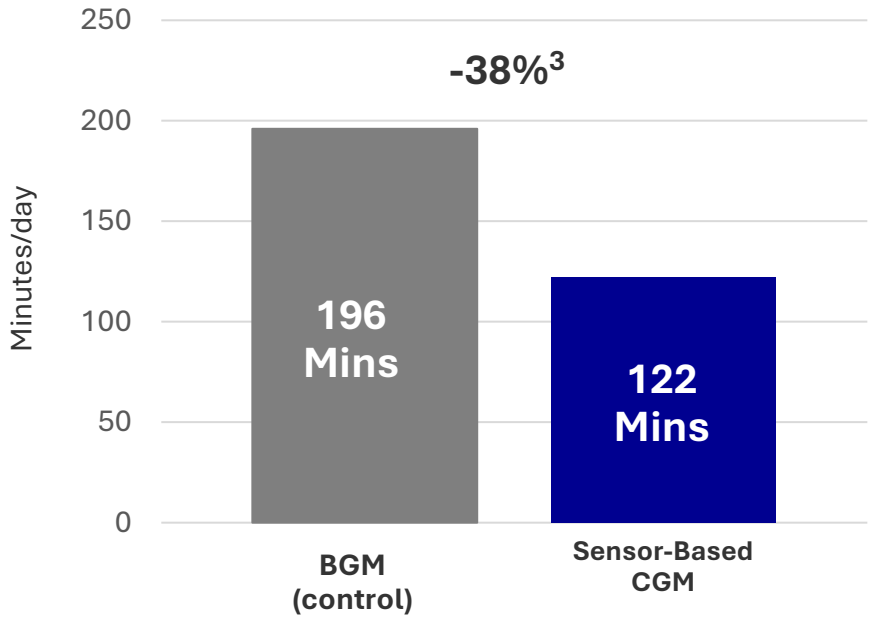


Bergenstal RM, et al: ADA 2020, 69-OR

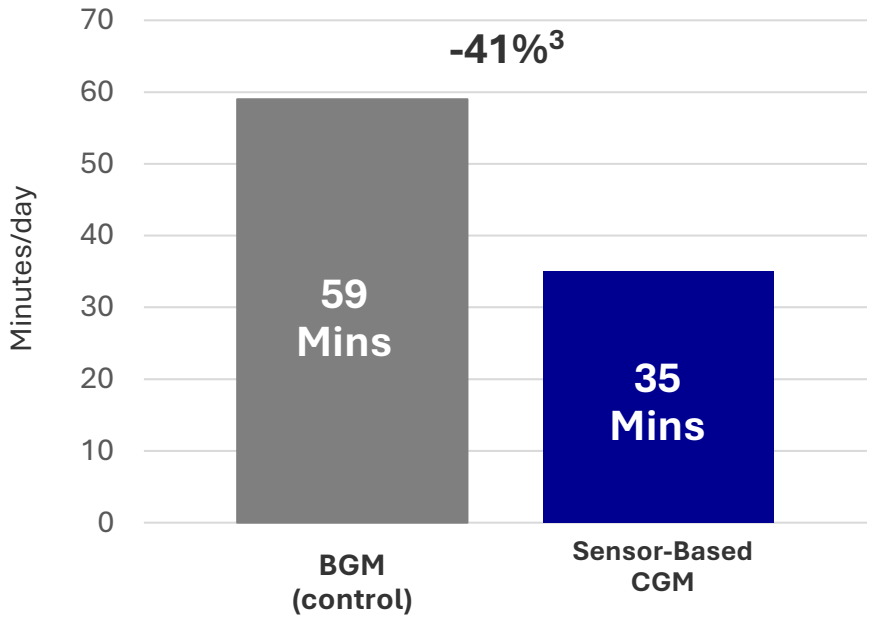
Reduced Time in Hypoglycemia

Whether they had T1D or T2D, patients on CGM reduced time in hypoglycemia without statistically significant increase in A1c

Patients with T1D
(IMPACT Trial)*†[1]

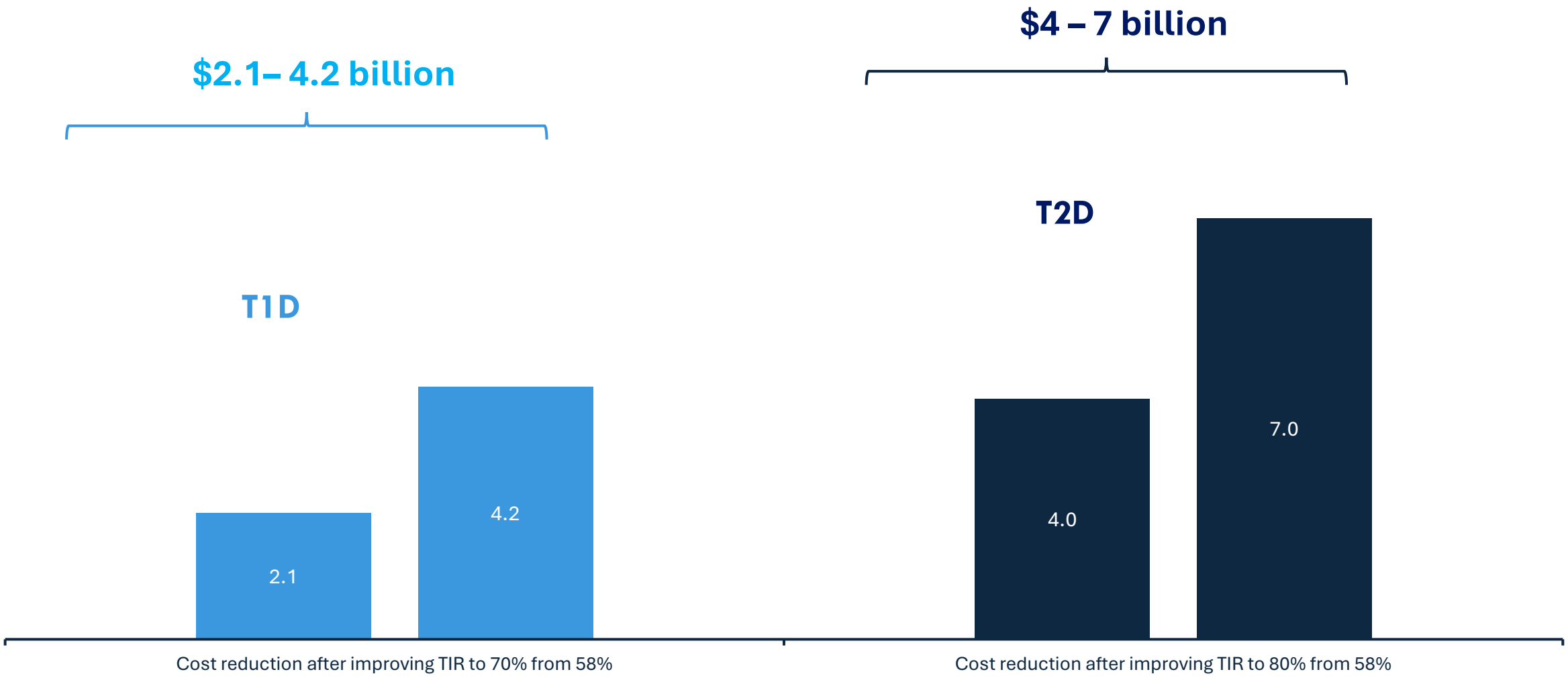


Patients with T2D
(REPLACE Trial)*‡[2]



Bolinder, Jan, et al. *The Lancet* 388, no. 10057 (September 2016): 2254-2263.
Haak, Thomas, et al. *Diabetes Therapy* 8, no. 1 (February 2017)

10-year Cost Reduction by Improving TIR in People with T1D and T2D to 70% and 80%



Beck et al. (2019) reanalyzed data from four clinical trials that used CGM devices in patients with T1D. Vigersky and McMahon (2019) performed a meta-analysis of 18 articles where data was derived from people with Type 1 (majority), and Type 2 diabetes.T1D, type 1 diabetes; T2D, type 2 diabetes TIR, time in range. 9. IQVIA Core Diabetes Model, October, 2019

2025 ADA T2D Standards of Care

Dr. Bergenstal Revision

Goal: Achievement and Maintenance of Weight and Glycemic Goals

If A1c is above goal or significant hypoglycemia or hyperglycemia or barriers to care are identified

- **Refer to DSMES** to support self-efficacy in achievement of treatment goals
- **Consider technology** (eg, diagnostic or personal CGM) to identify therapeutic gaps and tailor therapy
- Identify and **address SDOH** that impact achievement of treatment goals

Goal: Achievement and Maintenance of Weight and Glycemic Goals

- Refer to DSMES to support self-efficacy in achievement of treatment goals
- **Initiate technology** (eg, diagnostic or personal CGM) to identify therapeutic gaps and tailor therapy
- Identify and address SDOH that impact achievement of treatment goals

If A1c is above goal or significant hypoglycemia or hyperglycemia or barriers to care are identified

- Prevent complications
- Optimize QoL

- A1c, glycated hemoglobin; DSMES, diabetes self-management education and support; SDOH, social determinants of health; T2D, type 2 diabetes mellitus.
- American Diabetes Association Professional Practice Committee. Diabetes Care. 2025;48(suppl_1):S146-S166.

CGM Can Help Improve A1c in Patients with T2D Receiving GLP-1 RA Therapy*[1]

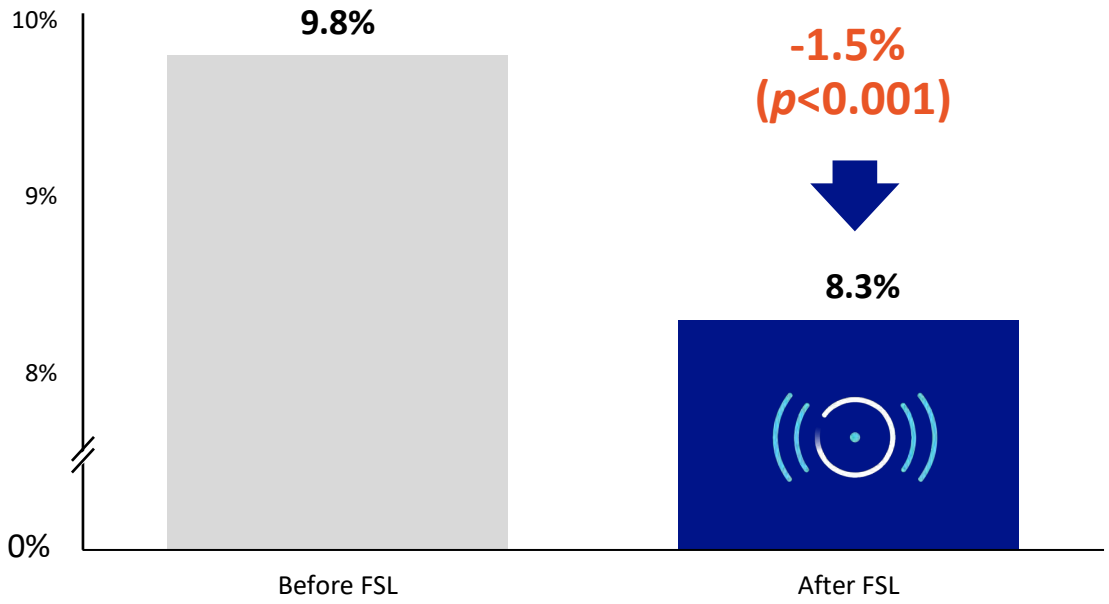
GLP-1 RA Therapy + **FreeStyle Libre systems** **+ 6 months**

ADDED WITHIN 180 DAYS

RESULTS

Patients on prior GLP-1 RA therapy experienced significant improvement in A1c after acquiring FreeStyle Libre systems, irrespective of GLP-1 RA duration, GLP-1 RA type, or insulin therapy type.

A1c values (at baseline and after 6 months) (N=1,454)

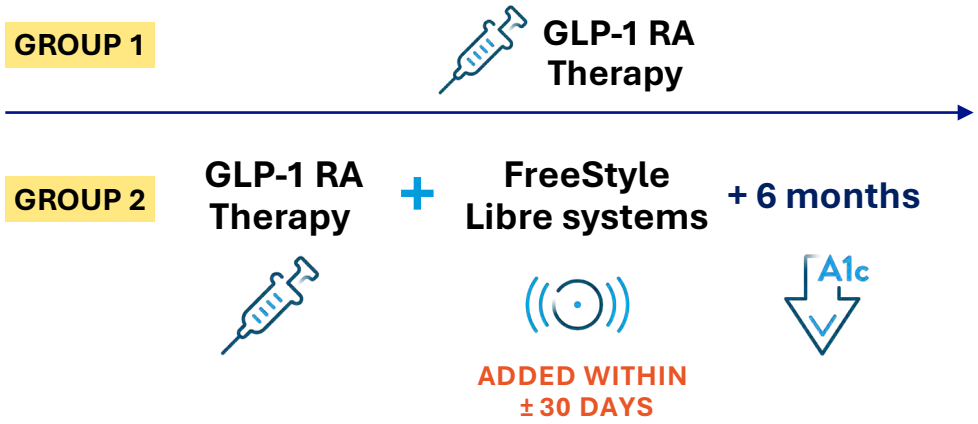


* Real-world study that utilized a linked electronic health records (EHR)-claims database and included adults with T2D and A1c at baseline >=8% who were already on GLP-1 RA therapy

Reference: 1. Miller E, et al. *Diabetes Ther*. 2024. doi: 10.1007/s13300-024-01619-1.

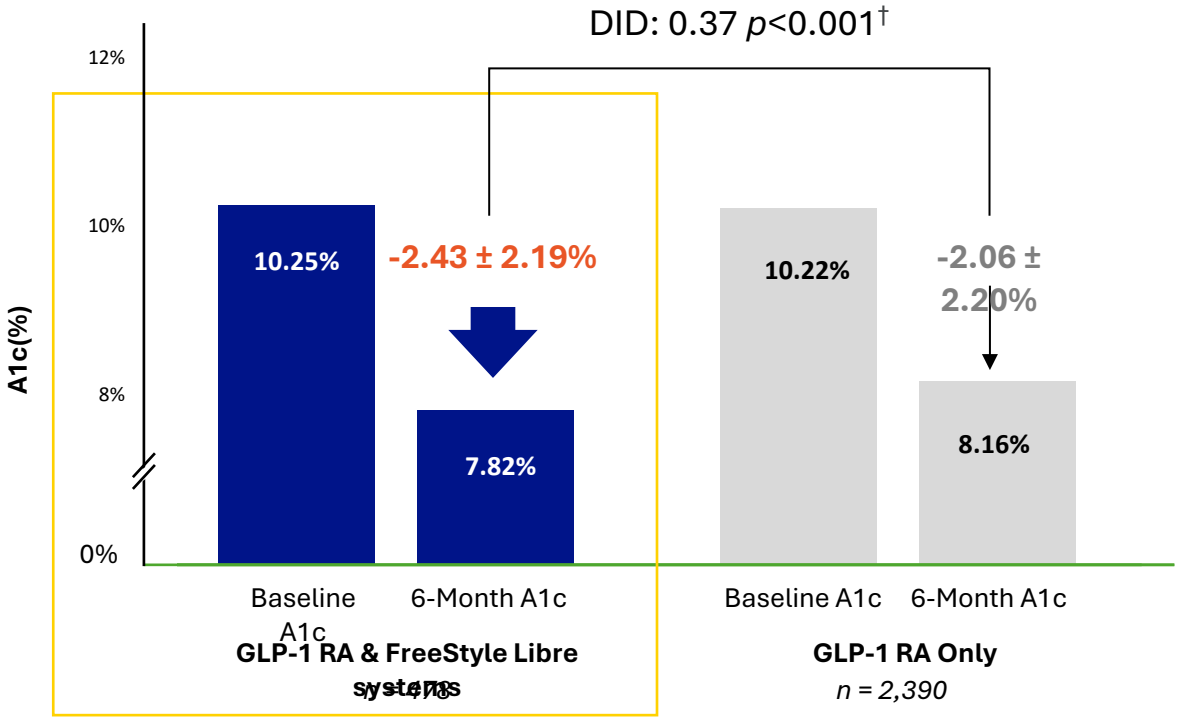
Initiating FreeStyle Libre systems in combination with GLP-1 RA therapy in patients with T2D can provide greater clinical results*[1]

- OUTCOMES



RESULTS

After 1:5 ratio matching (GLP-1 & FSL: GLP-1), patients in the GLP-1 & FSL group experienced greater A1c reduction compared to those treated with GLP-1 RA only.

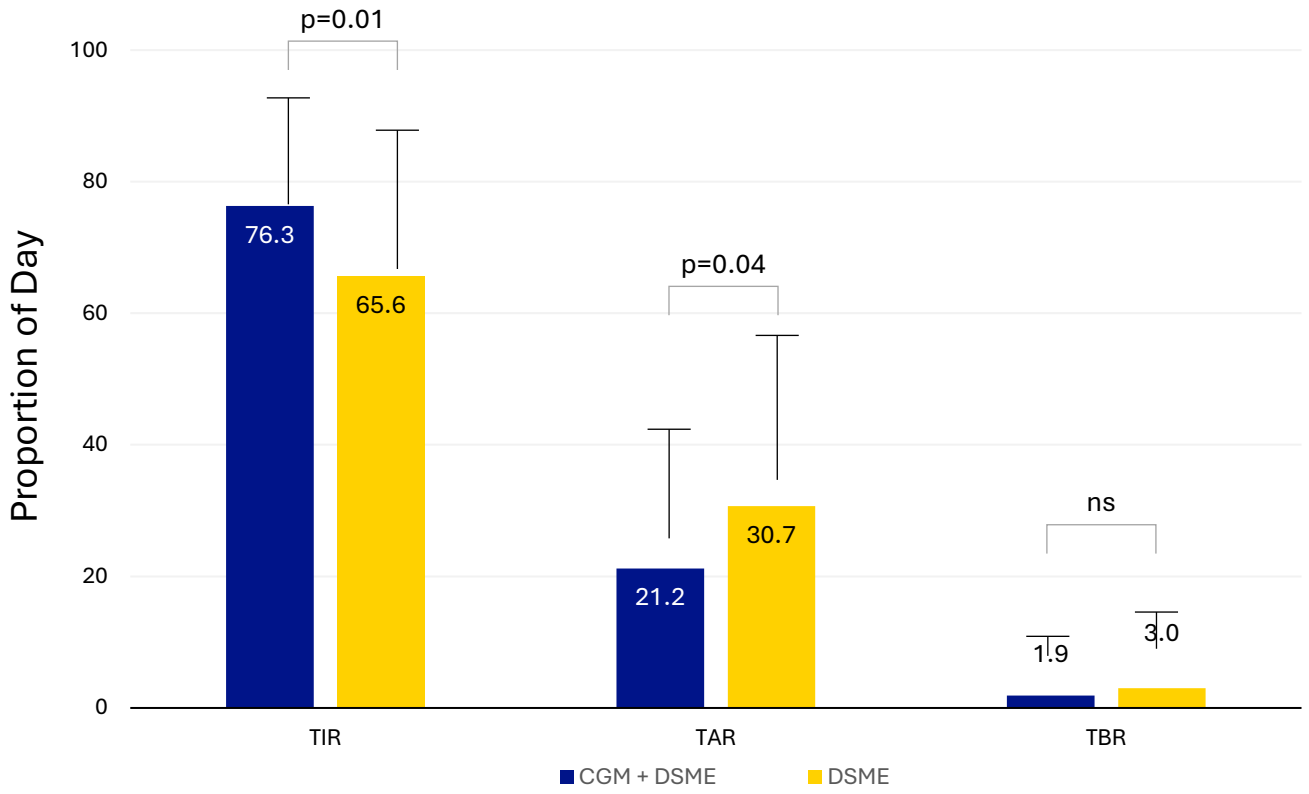


*Real-world study that utilized a linked electronic health records (EHR) claims database and included adults with T2D and HbA1c ≥8% who acquired their first GLP-1 RA between 2018-2022. 24,246 subjects with GLP-1 RA only, and 478 subjects with a GLP-1 RA and a FreeStyle Libre CGM system group. Cohorts were matched at baseline insulin therapy, age, sex, HbA1c, and GLP-1 RA type. Out of the 24,246 GLP-1 RA-only patients, 2,390 matched the criteria with the GLP-1 RA and FreeStyle Libre CGM system group. † Difference-in-Difference=-0.37 [-0.56, -0.19] p<0.001.

Reference: 1. Wright EE, et al. *Diabetes Technol Ther*. 2024. https://doi:10.1089/dia.2024.0015.

Benefits with CGM in Patients with T2D Using Non-Insulin Therapies

- The IMMEDIATE trial showed use of CGM with DSME improved glycemic control over DSME alone.*[1]



PRIMARY OUTCOMES*[1]:

- CGM + DSME arm showed greater TIR (76.3 ± 17.4) compared to DSME arm (65.6 ± 22.6).
- 9.9% greater TIR using CGM with DSME in adults with T2D using non-insulin therapies.

Every 5% increase in time in range is associated with clinically significant benefits for individuals with type 1 or type 2 diabetes[2,3]

DSME = diabetes self-management education
*Data from this study was collected with the outside US version of FreeStyle Libre 14 day system. FreeStyle Libre 2 and 3 has the same features as FreeStyle Libre 14 day system with optional, real-time glucose alarms. Therefore, the study data is applicable to both products.

References: 1. Aronson R, et al. *Diabetes Obes Metab*. 2023. https://doi.org/10.1111/dom.14949. **2.** Beck, R. Journal of Diabetes Science and Technology (2019): https://doi.org/10.1177/1932296818822496. **3.** Vigersky, R. Diabetes Technology and Therapeutics (2019): https://doi.org/10.1089/dia.2018.0310.

Patients Expressed Greater ease in Managing Their Glucose and Experienced Better Diabetes Outcomes*[1]

95%

Users report having a better understanding of their glucose fluctuations*[1]

77%

Users report less hypoglycemic episodes*[1]

92%

Users found it easier to manage meal-time glucose*[1]

37%

Users report engaging in physical activity more frequently*[1]

62%

Users report that house mates and family members are less worried about their diabetes*[1]

*Data from this study was collected with the outside US version of FreeStyle Libre 14 day system. FreeStyle Libre 2 and FreeStyle Libre 3 have the same features as FreeStyle Libre 14 day system with real-time glucose alarms. Therefore, the study data is applicable to all products.

Reference: 1. Fokkert M, et al. *BMJ Open Diab Res Care*. 2019. doi:10.1136/bmjdrc-2019-000809.

My Patient Case

70-year-old woman with T2D × 20 years

Initial HbA1c: 7.5%	
Weight: 221.4 lbs; BMI (body mass index): 38.6 kg/m²	
Presenting medications	▪ Insulin aspart 70/30 60 units BID (am and pm) ▪ Empagliflozin 25 mg

Image courtesy of Eden M. Miller, DO, D-ABOM, D-ACD.

CGM AGP Report - Before

AGP Report

October 27, 2022 - November 9, 2022 (14 Days)

GLUCOSE STATISTICS AND TARGETS

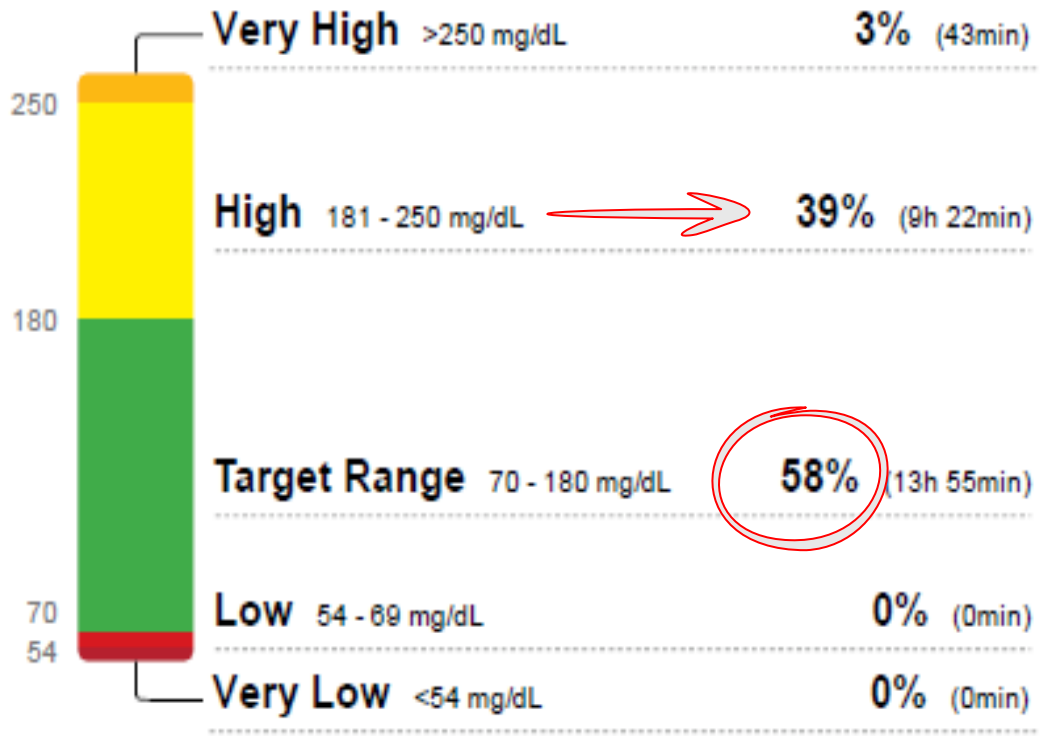
October 27, 2022 - November 9, 2022	**14 Days**
Time CGM Active:	**90%**

Ranges And Targets For	Type 1 or Type 2 Diabetes
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	**180** mg/dL
Glucose Management Indicator (GMI)	**7.6%**
Glucose Variability	**16.8%**

TIME IN RANGES



Glucose variability defined as percent coefficient of variation (%CV); target ≤ 36%

AGP, ambulatory glucose profile; CGM, continuous glucose monitoring.

Image courtesy of Eden M. Miller, DO, D-ABOM, D-ACD.

CGM AGP Report - Before

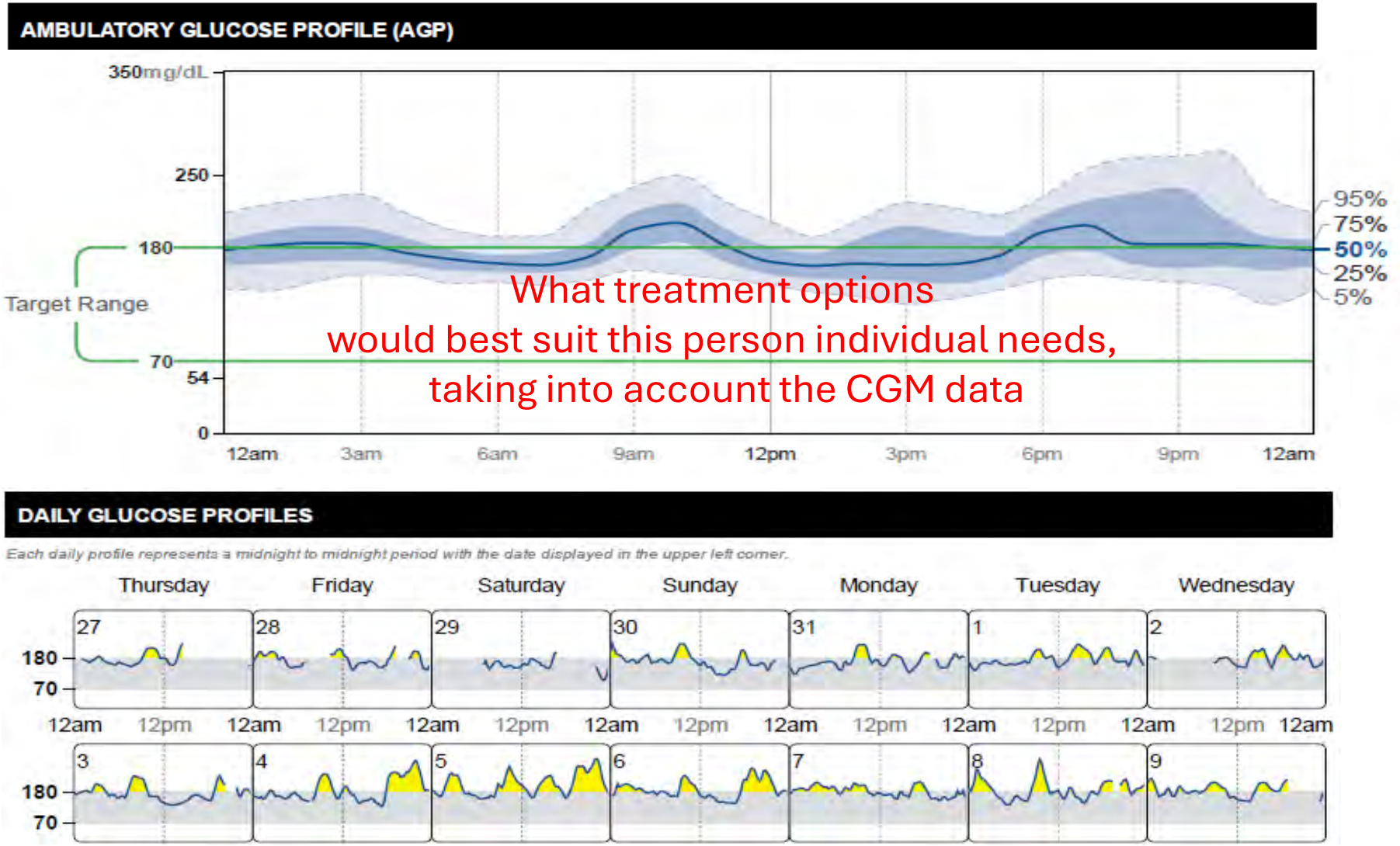


Image courtesy of Eden M. Miller, DO, D-ABOM, D-ACD.

Visit data at follow up

70-year-old woman with T2D × 20 years

HbA1c: 5.9%

TIR (Time in Range) 98%

Current Medications Tirzepatide 15mg weekly, Empagliflozine 25mg

Weight; 195 lbs; BMI: 34.1 kg/m^2

- Image courtesy of Eden M. Miller, DO, D-ABOM, D-ACD.

CGM AGP Report - After

AGP Report

December 5, 2024 - December 18, 2024 (14 Days)

GLUCOSE STATISTICS AND TARGETS

December 5, 2024 - December 18, 2024	**14 Days**
Time CGM Active:	**94%**

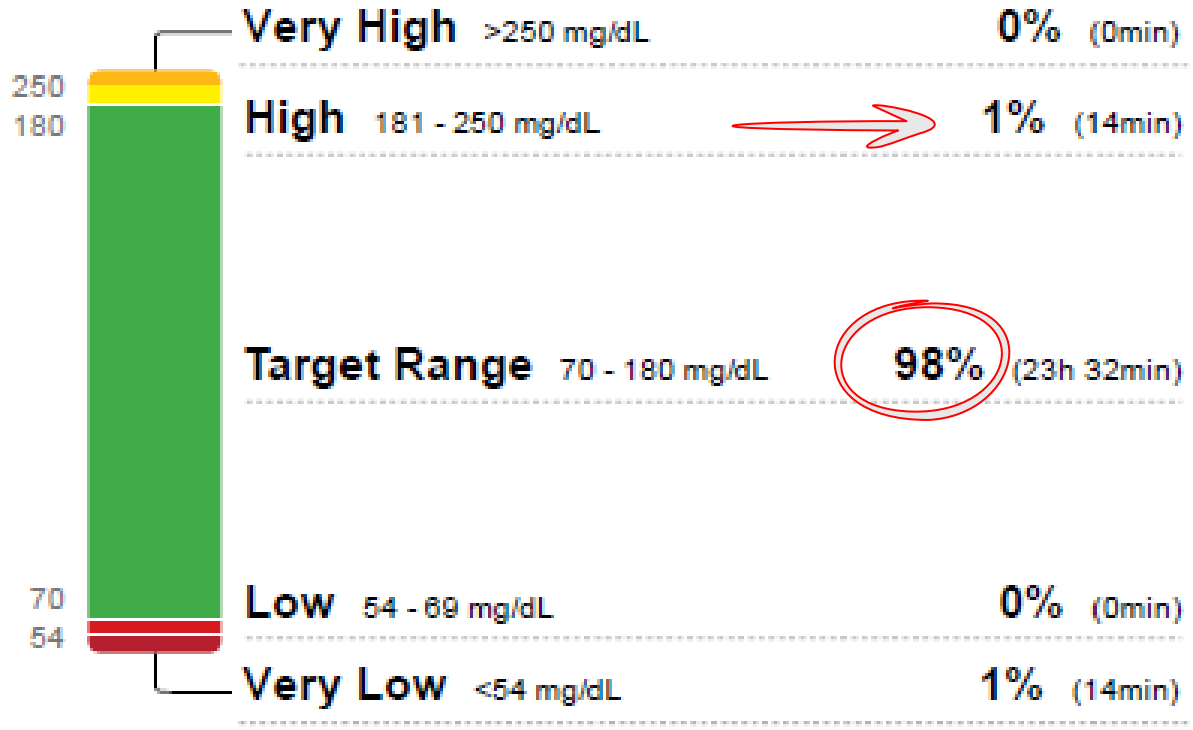
Ranges And Targets For — Type 1 or Type 2 Diabetes

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	**124** mg/dL
Glucose Management Indicator (GMI)	**6.3%**
Glucose Variability	**16.3%**

TIME IN RANGES



- Image courtesy of Eden M. Miller, DO, D-ABOM, D-ACD.

It is Hard to Manage What You Do Not Monitor

- **CGM**: Takes diabetes out of the past, into the present, and predicts the future.
- **CGM:** Reveals the individual glycemic journey empowering the patient to make meaningful lifestyle choices, and engagement in their own disease.
- **CGM:** Guides the HCP to address the problem glycemia, improving time in range, overcoming inertia, increasing patient satisfaction as well as safety.

Translating CGM Technologies into Real World Case-Based Management Across the Full Spectrum of Diabetes Care

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Immediate Past President

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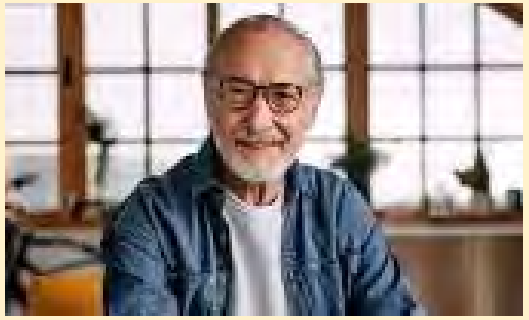
Adjunct Assistant Professor, Midwestern University

Case Study #1: January 21, 2025

69-year-old male

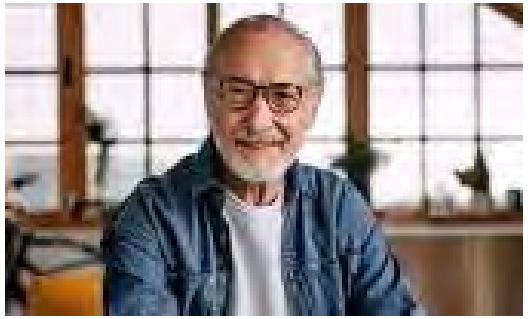
Past medical history	T2DM with CAD, HTN, and HLD
Medications	• Metformin 1,000mg BID • -Pioglitazone 15mg daily • -Glargine 25u AM and 25u PM • -Aspart fixed mealtime dosing 20u breakfast, 18u lunch and 16u dinner • -Aspart correction factor 100 for glucose >200



Medication Trials

- Semaglutide 0.5mg weekly (severe appetite suppression/weight loss)
- Alogliptin (GI upset and poor appetite)
- SGLT2inhibitor (worsening OAB symptoms)

Case Study #1: January 21, 2025



Notes

- Long history of **depression and passive suicidal ideation**. Over the last year, depression and SI has stabilized through mental health treatment and the support of his son who lives nearby.
- Reports **travelling** more this interval due to daughter going through a **miscarriage**. **Left glargine** at home while travelling.
- Reports **nocturnal hypoglycemia** into the 50s 5-6x/week.

Case Study #1: January 21, 2025

GLUCOSE STATISTICS AND TARGETS

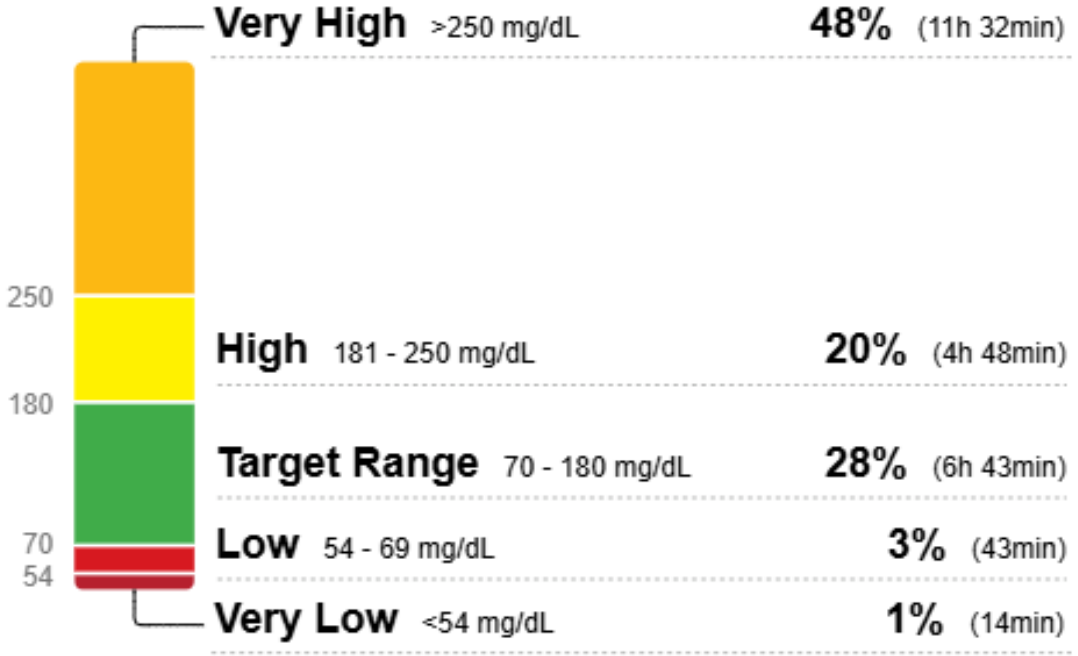
January 8, 2025 - January 21, 2025	**14 Days**
Time CGM Active:	**84%**

Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges Target Range 70-180 mg/dL	**Targets** % of Readings (Time/Day) 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.	

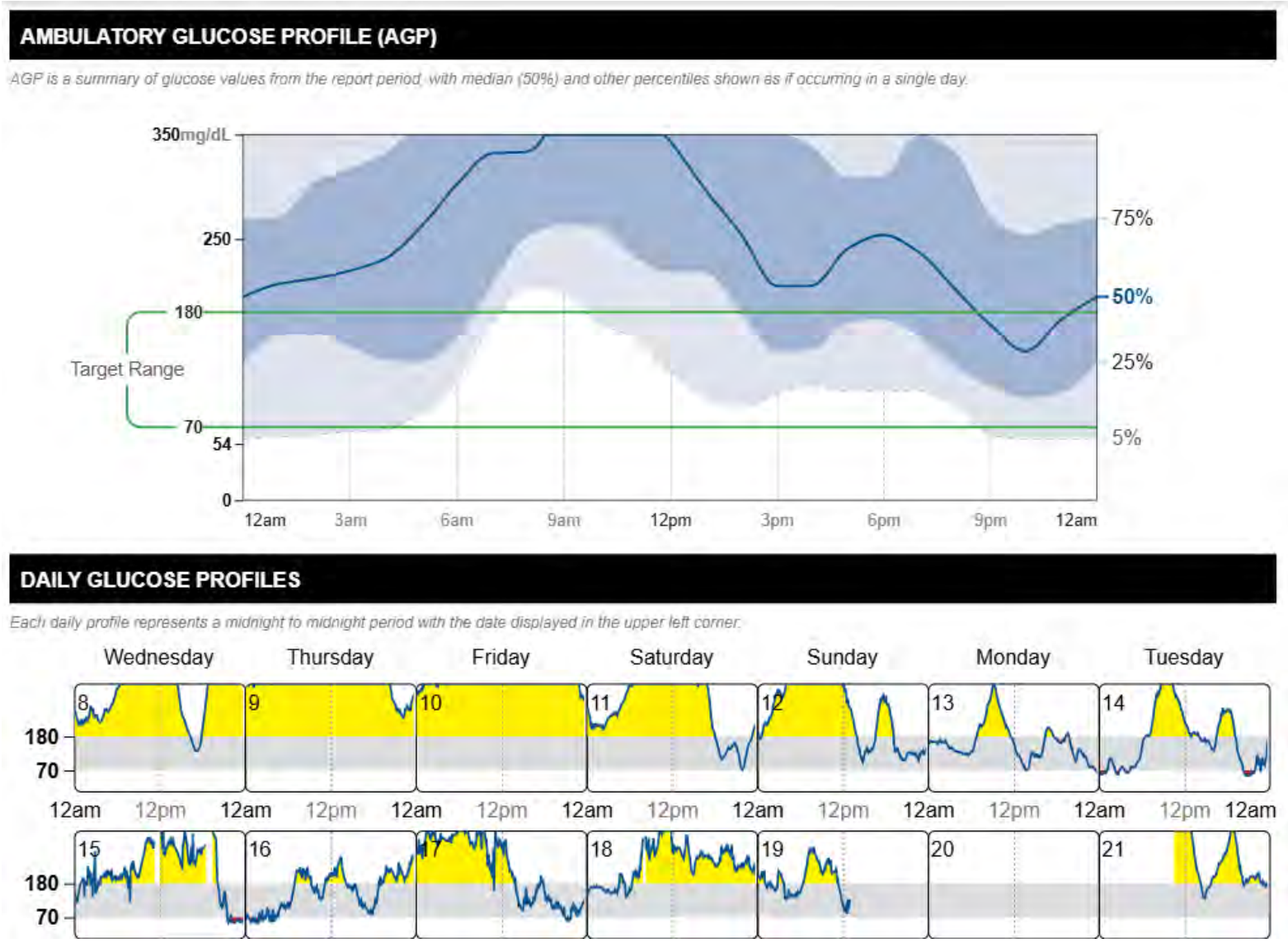
Average Glucose	**253** mg/dL
Glucose Management Indicator (GMI)	**9.4%**
Glucose Variability	**43.8%**

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

TIME IN RANGES



Case Study #1: January 21, 2025



Case Study #1: January 21, 2025

Recommendations:

1) Reviewed hypoglycemia safety plan

2) Glargine was decreased from 25u BID to 25u AM and 20u PM

3) Discussed the importance of mental health care, self-care, and psychosocial support. Recommend additional support by endocrine team.

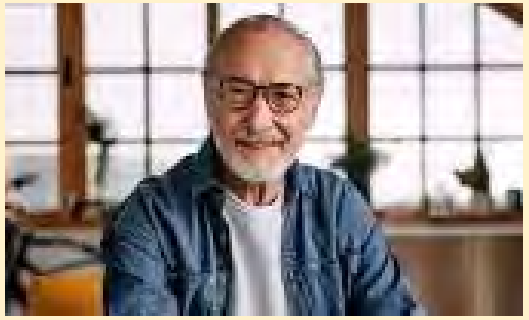
4) CGM upload 1 month

Case Study #1: March 25, 2025

69-year-old male

Past medical history	T2DM with CAD, HTN, and HLD
Medications	• Metformin 1,000mg BID • -Pioglitazone 15mg daily • -Glargine 25u AM and 25u PM • -Aspart fixed mealtime dosing 20u breakfast, 18u lunch and 16u dinner • -Aspart correction factor 100 for glucose >200

✓ Changes at last follow up 1/21/25: glargine decreased from 25units BID to 25u AM and 20u P



Medication Trials

- Semaglutide 0.5mg weekly (severe appetite suppression/weight loss)
- Alogliptin (GI upset and poor appetite)
- SGLT2inhibitor (worsening OAB symptoms)

Case Study #1: March 25, 2025

- Pt reports taking half dose of aspart at lunch and dinner, then if glucose is high **1-2 hours later**, will take a correction factor.
- Per pt: “I don't trust the fast-acting insulin" since he finds himself dropping **below 80** within 2 hours of the correction factor. Will treat with glucose tabs or orange juice.
- Pt shared how he is trying to **alter his diet** to minimize carbs, increase protein and protein powder, selecting less "sugar" vegetables.

Case Study #1: March 25, 2025

GLUCOSE STATISTICS AND TARGETS

March 12, 2025 - March 25, 2025	**14 Days**
Time CGM Active:	**95%**

Ranges And Targets For	Type 1 or Type 2 Diabetes
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)

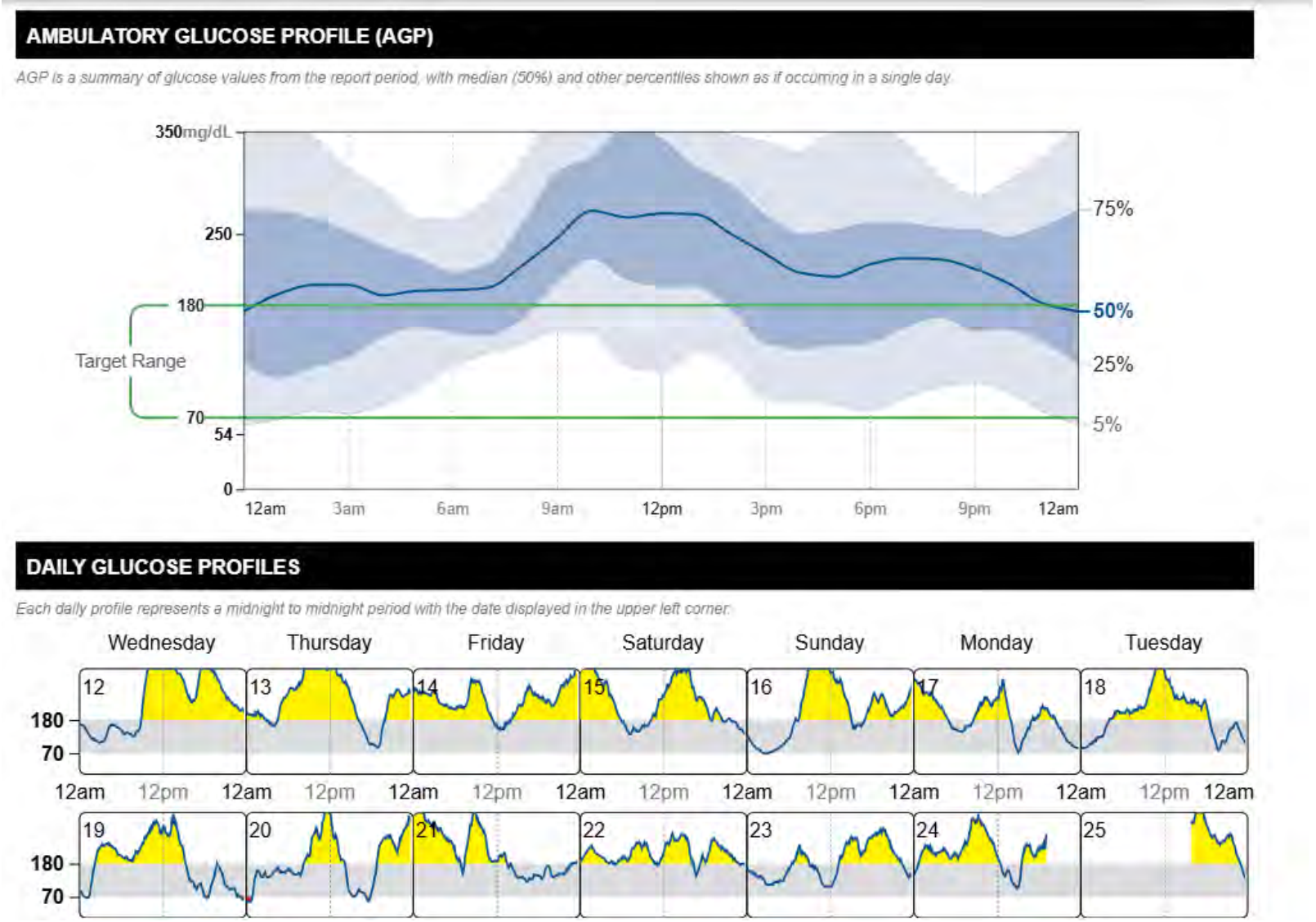
Each 5% increase in time in range (70-180 mg/dL) is clinically beneficial

Average Glucose	**217** mg/dL
Glucose Management Indicator (GMI)	**8.5%**
Glucose Variability	**36.3%**

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

TIME IN RANGES

Case Study #1: March 25, 2025



Case Study #1: March 25, 2025

Recommendations

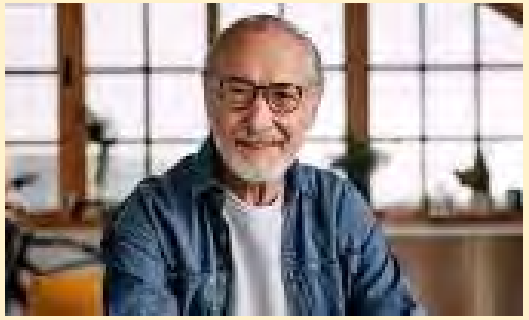
1) Avoidance of stacking due to hypoglycemia
2) Reinforced that he is treating hypoglycemia appropriately.
3) Recommended giving prescribed amounts of aspart pre-prandial
4) CGM upload 1 month
5) Pt is open to and agrees to a CDCES RD visit to assist with his dietary plan.

Case Study #1: April 14, 2025

69-year-old male

Past medical history	T2DM with CAD, HTN, and HLD
Medications	• Metformin 1,000mg BID • -Pioglitazone 15mg daily • -Glargine 25u AM and 20u PM • -Aspart fixed mealtime dosing 20u breakfast, 18u lunch and 16u dinner • -Aspart correction factor 100 for glucose >200

✓ Changes 3/25/25: Avoid stacking, re-educated on hypoglycemia safety plan, reinforced taking prescribed doses of aspart, schedule appt with CDCES/RD



Medication Trials

- Semaglutide 0.5mg weekly (severe appetite suppression/weight loss)
- Alogliptin (GI upset and poor appetite)
- SGLT2inhibitor (worsening OAB symptoms)

Case Study #1: April 14, 2025

- Pt reports that he is taking only **half dose of aspart** at dinner, then glucose goes high, and pt uses the **correction factor 2 hours post dinner** if glucose >200.
- **Fear of hypoglycemia** identified. States that on Sunday evening he "deliberately kept my blood glucose high since I was in a church pageant and didn't have time to treat low blood sugar". Reported one hypoglycemic event on Friday while moving furniture, treated using rule of 15.
- He is changing his diet **to lower "sugar" items and higher protein**. Following more of a "Keto" diet. Has **RD appt next month** to discuss better foods for glycemic control.
- Regarding motivation to change, pt states **"your team is wearing me down with kindness"** which supports changes he is making at home.

Case Study #1: April 14, 2025

April 2, 2025 - April 15, 2025 (14 Days)

GLUCOSE STATISTICS AND TARGETS

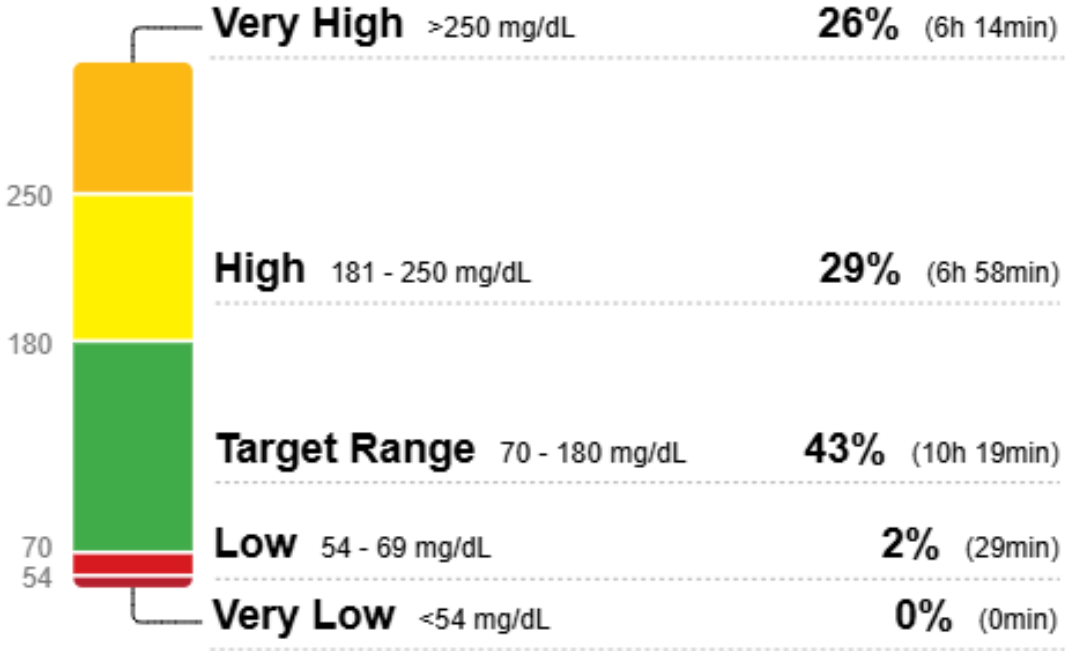
April 2, 2025 - April 15, 2025	**14 Days**
Time CGM Active:	**96%**

Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges Target Range 70-180 mg/dL	**Targets** % of Readings (Time/Day) 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.	

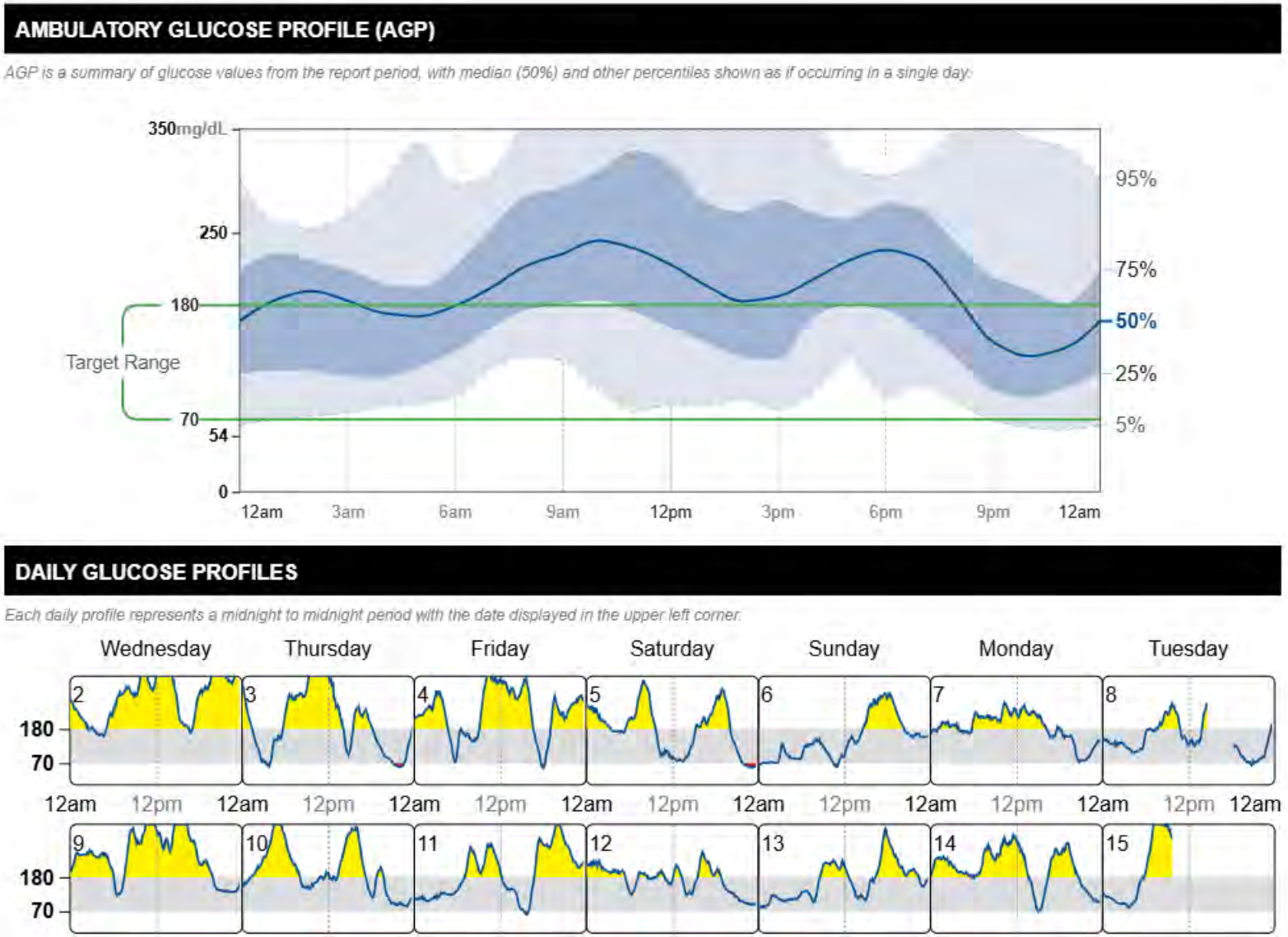
Average Glucose	**198** mg/dL
Glucose Management Indicator (GMI)	**8.0%**
Glucose Variability	**40.9%**

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

TIME IN RANGES



Case Study #1: April 14, 2025



Case Study #1: April 14, 2025

Recommendations

1) Congratulated on improvement in time in range
2) Discussed whole health principles including sleep, relationships, stress management, food/drink
3) Re-educated on risks of stacking and importance of avoidance hypoglycemia. Reinforced hypoglycemia safety plan.
4) Slightly increase to dinner aspart 10units plus correction factor if needed, only take correction factor at mealtimes
5) Follow up with RD as planned
6) Follow up with endocrine provider one month as planned

"INTERACTIVE DIALOGUE SESSION"

Your Questions, Perspectives, and Discussion Points