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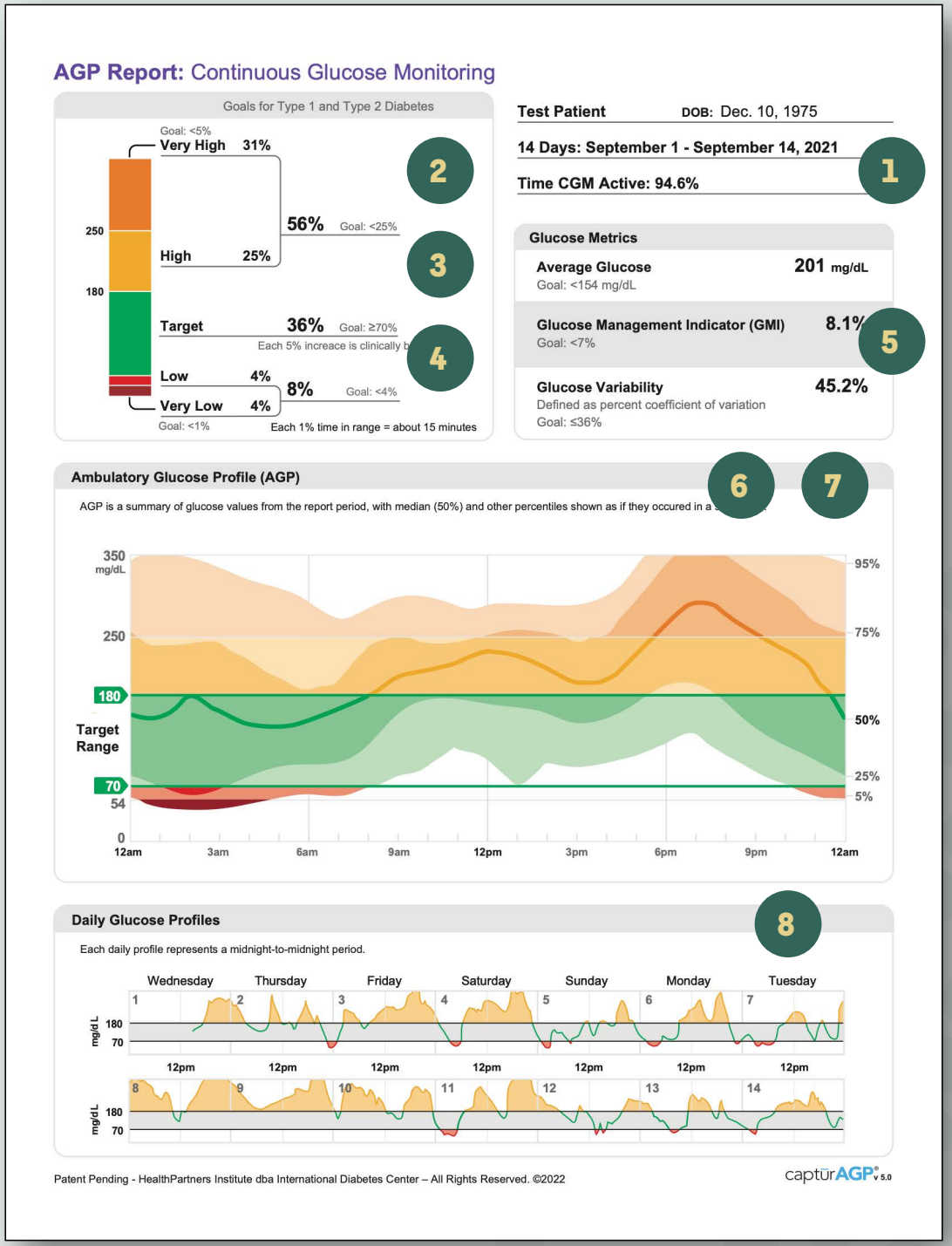
Decoding the AGP for Personalized Diabetes Management

Utilizing readouts to inform clinical decisions

Contents



AGP Report

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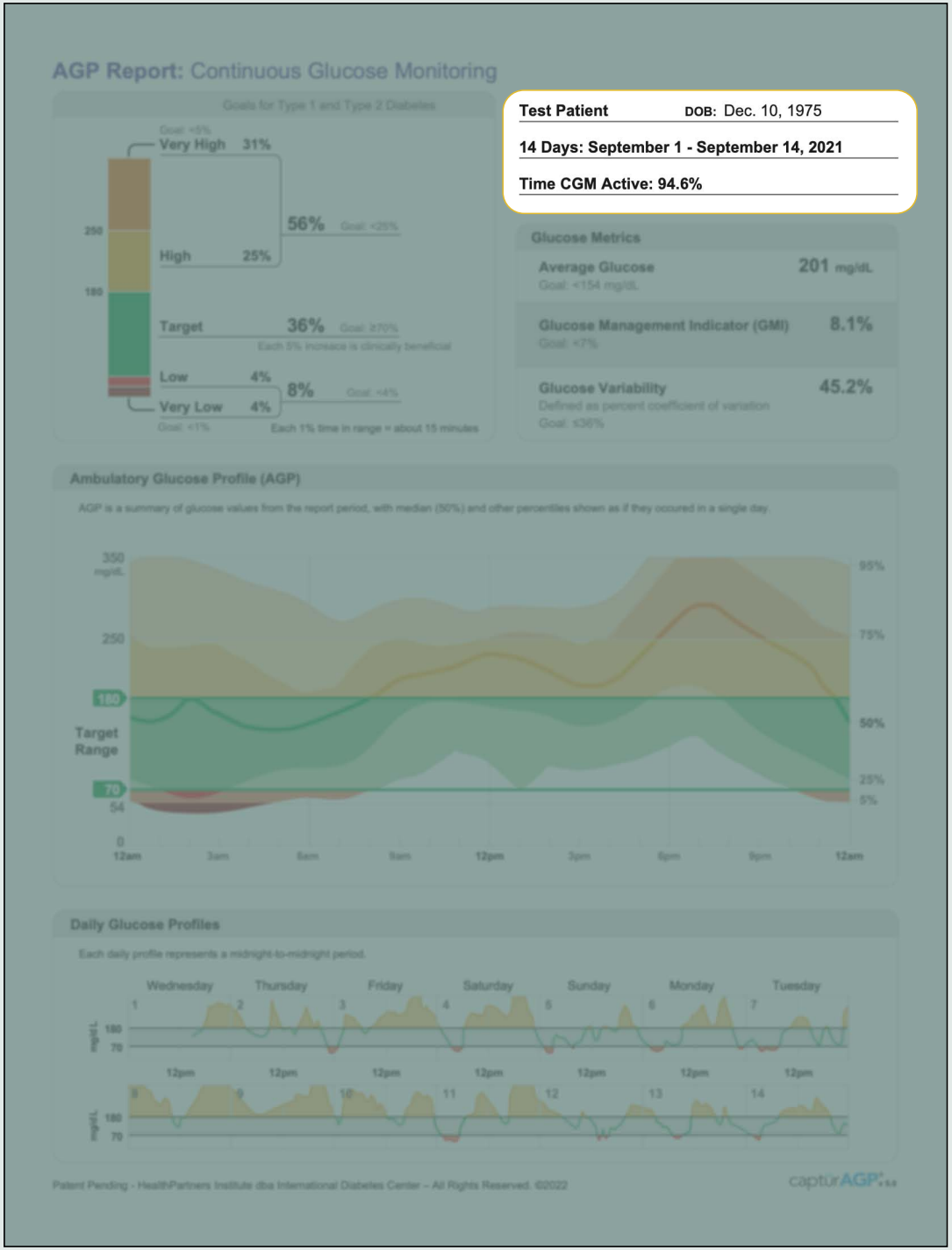

Determine availability of adequate data

Review the % Time CGM is active on the AGP Report. Better clinical decisions are made when ≥ 70% of the possible data points are captured.[1,2]

Patterns and trends in glycemic control analyzed over a period of at least ≥70% or ~10 days of CGM wear are reliable predictors of glucose exposure over 3 months.[3]

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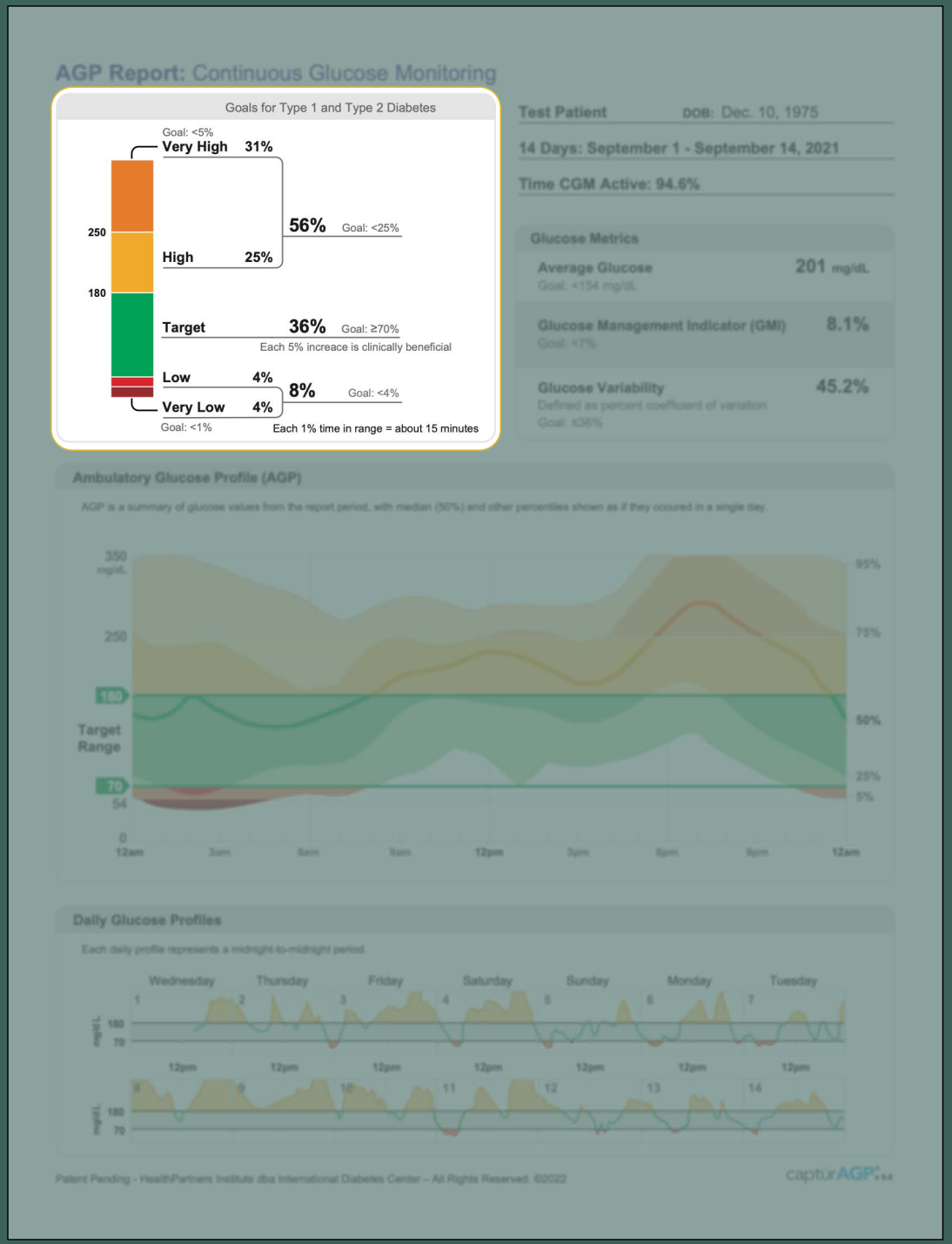


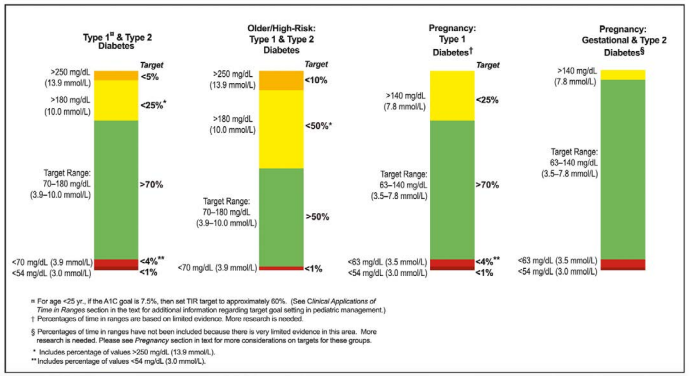
2

Standardized glucose target levels

Set by an International Consensus Panel of diabetes experts, this graphic representation of glucose statistics and targets for Type 1 Diabetes (T1D) and Type 2 Diabetes (T2D) displays optimal goals for Time in Range (TIR) - green, Time Below Range (TBR) - two categories in light and dark red, and Time Above Range (TAR) - two categories in yellow and orange.[1,4]

Important

Separate targets have been recommended for women with T1D during pregnancy; women with gestational and T2D during pregnancy, and for people who are at higher risk of hypoglycemia because of age, duration of diabetes, duration of insulin therapy, or impaired awareness of hypoglycemia.[4]



‡ For age <25 yr., if the A1C goal is 7.5%, then set TIR target to approximately 50%. (See *Clinical Applications of Time in Ranges* section in the text for additional information regarding target goal setting in pediatric management.)
† Percentages of time in ranges are based on limited evidence. More research is needed.
§ Percentages of time in ranges have not been included because there is very limited evidence in this area. More research is needed. Please see *Pregnancy* section in text for more considerations on targets for these groups.
* Includes percentage of values >250 mg/dL (13.9 mmol/L).
** Includes percentage of values <54 mg/dL (3.0 mmol/L).

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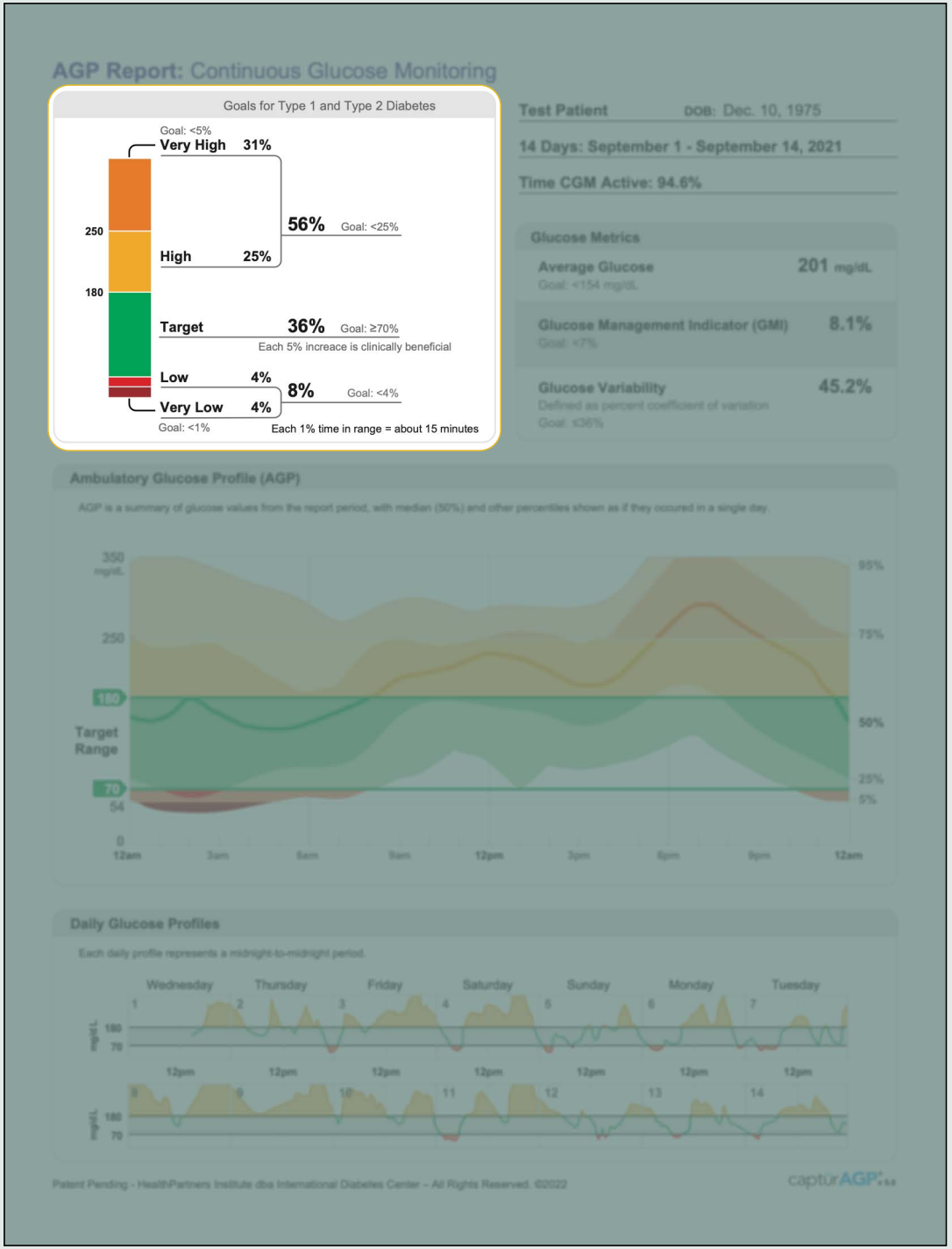

3

Beyond A1C to Time in Range

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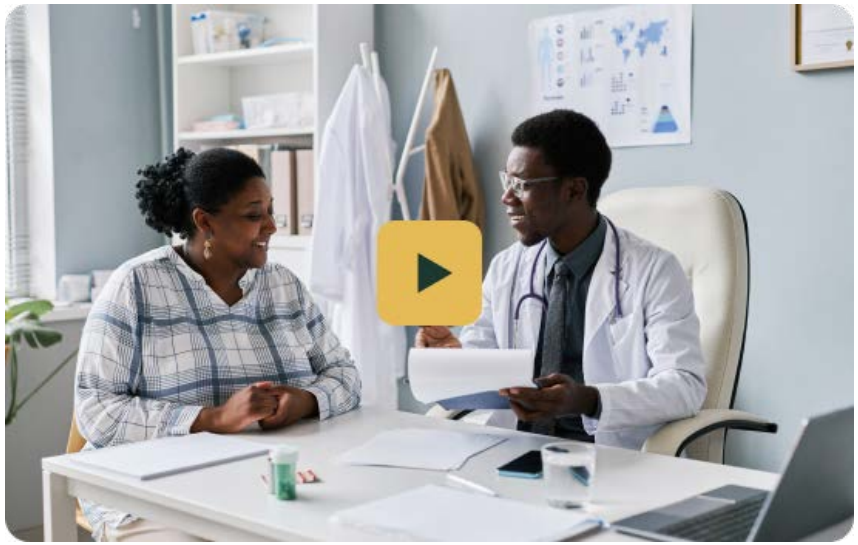

Reference [5-14]

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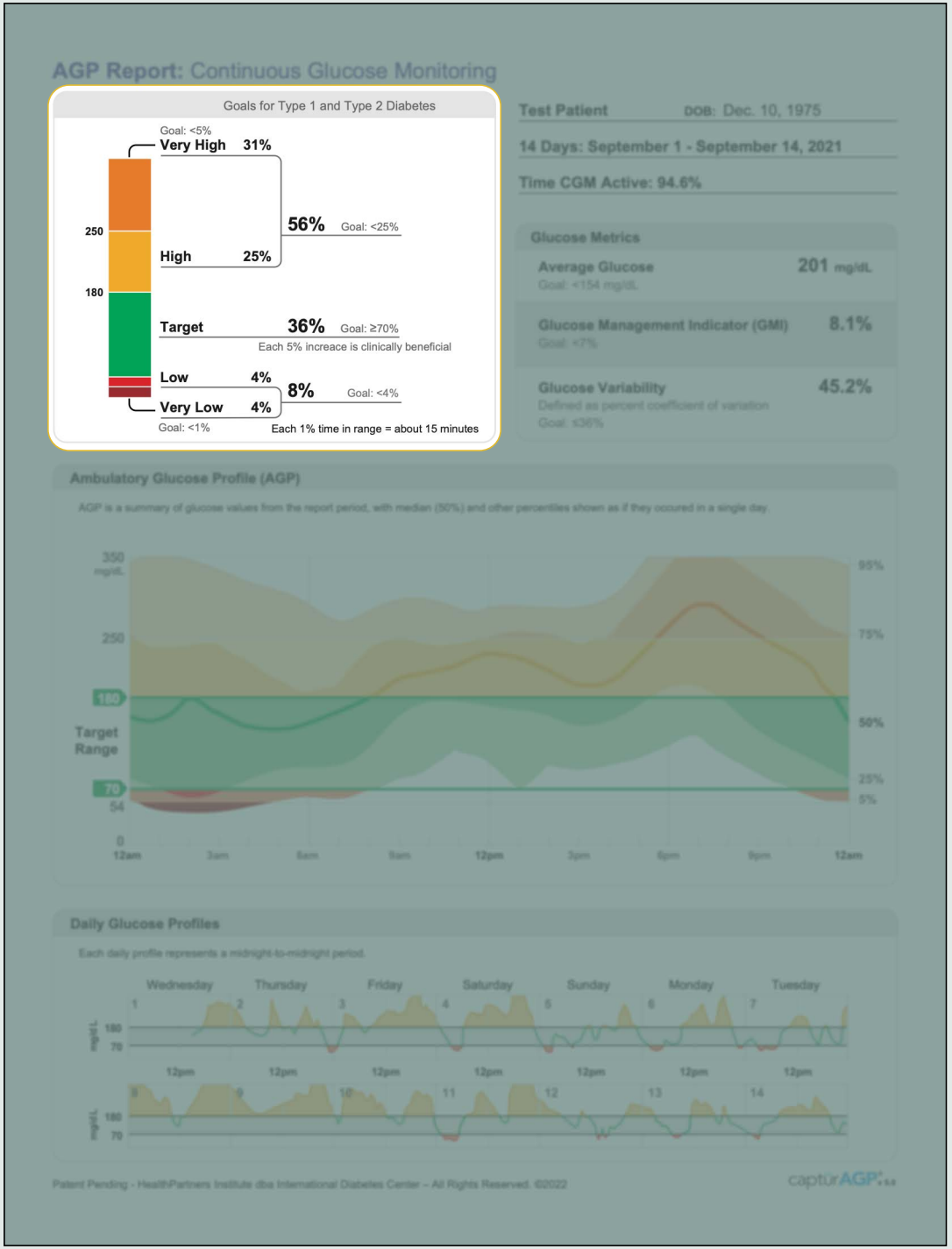

4

Clinical trial check-in

Recent research underscores the significance of TIR in diabetes management, revealing an inverse relationship between TIR 70–180 mg/dL and the occurrence of diabetes complications like retinopathy, peripheral neuropathy, and cardiovascular disease.[6,9-12]

Impact on A1C and TIR

Data showed that discontinuing CGM usage caused partial reversal of A1C reduction and TIR improvements in individuals with type 2 diabetes on basal insulin.[15]

Impact on hospitalizations

A retrospective database study of patients with type 2 diabetes who were treated with short- or rapid-acting insulin therapy demonstrated that CGM usage was associated with reductions in inpatient and emergency outpatient acute diabetes-related events (ADEs) and all-cause hospitalization (ACH) rates. Also, notable reductions in ADEs and ACH rates were seen within the first 45 days of CGM usage.[16]

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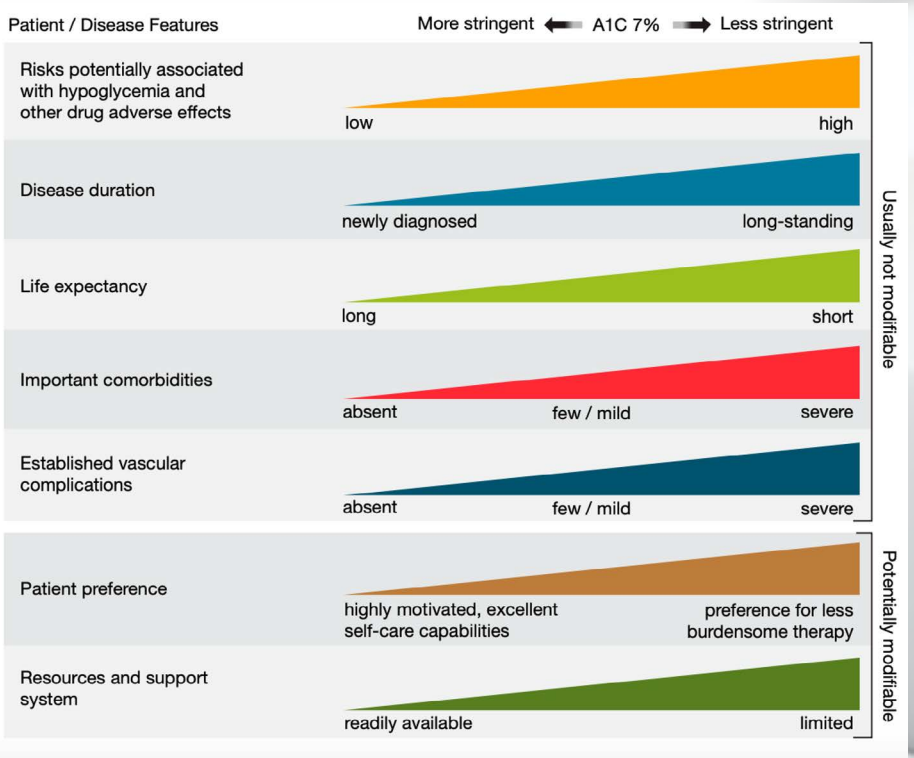
Personalized treatment tip

Standard glucose target recommendations are a starting point and ultimately should be individualized for each person with diabetes based on their risk for hypoglycemia, likelihood of benefit from intensive glycemic control, and treatment burden.[4]

Even though the AGP does not set A1C targets, there is a correlation between the A1C and Time in Range (TIR) that can be used to inform clinical decision-making.[8]

Patient and disease factors used to guide individualized glycemic targets are depicted in the figure below.[17] Factors that are potentially modifiable and those that usually are not modifiable can influence risks and benefits of therapy.[7] Therefore, it is vital for the clinical care team to determine patient-specific glycemic targets, reevaluating over time as patient factors change to balance the risks and benefits.



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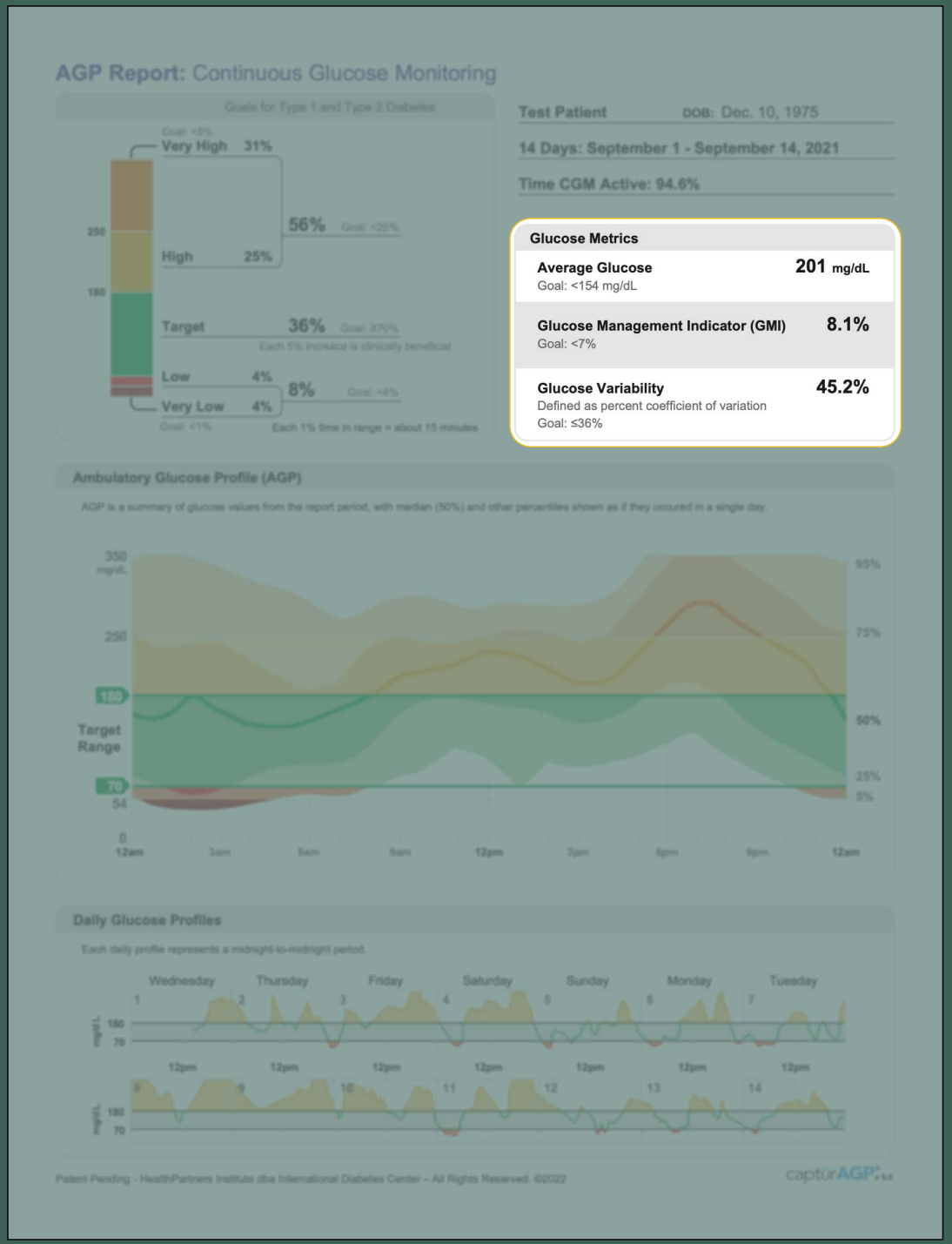

5

Assess blood glucose fluctuations beyond A1C

Glycemic variability

Because of the limitations of A1C, the search has continued for alternative ways to measure and assess blood glucose fluctuations. Glycemic variability (GV; the coefficient of variation [%CV] metric) is an indicator of hyperglycemia and hypoglycemia and is a measure of the fluctuations or oscillations of the glucose measurements throughout the day or days. GV takes into consideration both the amplitude of the excursion (how far out of range a blood glucose measurement is) and the time spent in the excursion (how long the blood glucose is out of range). The target for GV is <36%.[13,18-20]

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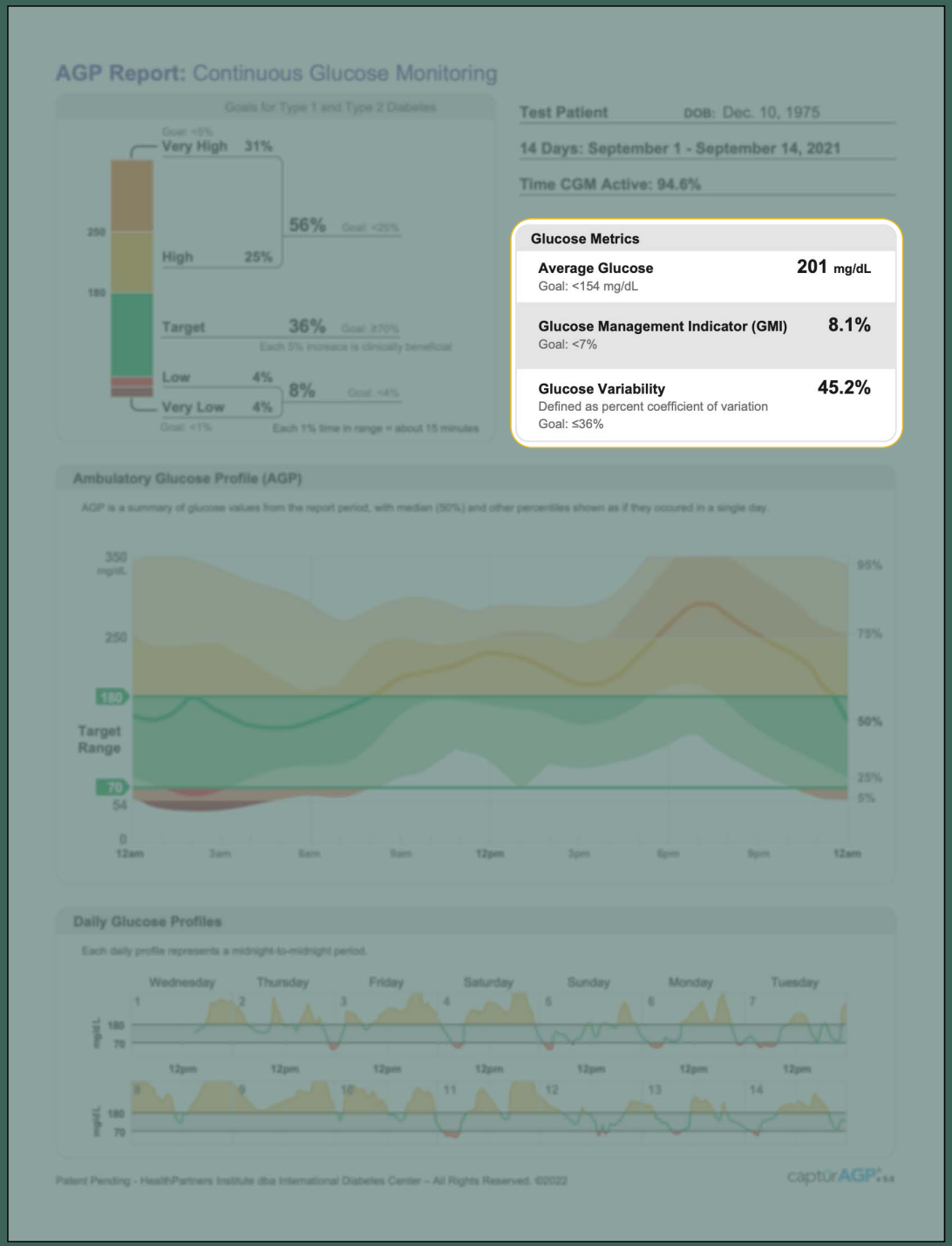

The Importance of Glycemic Variability

Click to watch Dr. Eugene Wright, Jr. discuss this topic (registration required).

Reference [1,6,13,20-24]

Glucose management indicator

The glucose management indicator (GMI) is a metric that indicates an estimated average A1C level by converting an individual's mean glucose readings using a population-based formula. When it comes to the full assessment of glycemic control, discordance between laboratory A1C and GMI values in a real-world setting suggest that healthcare providers evaluate A1C and GMI as only individual pieces of a complete puzzle.[25,26]

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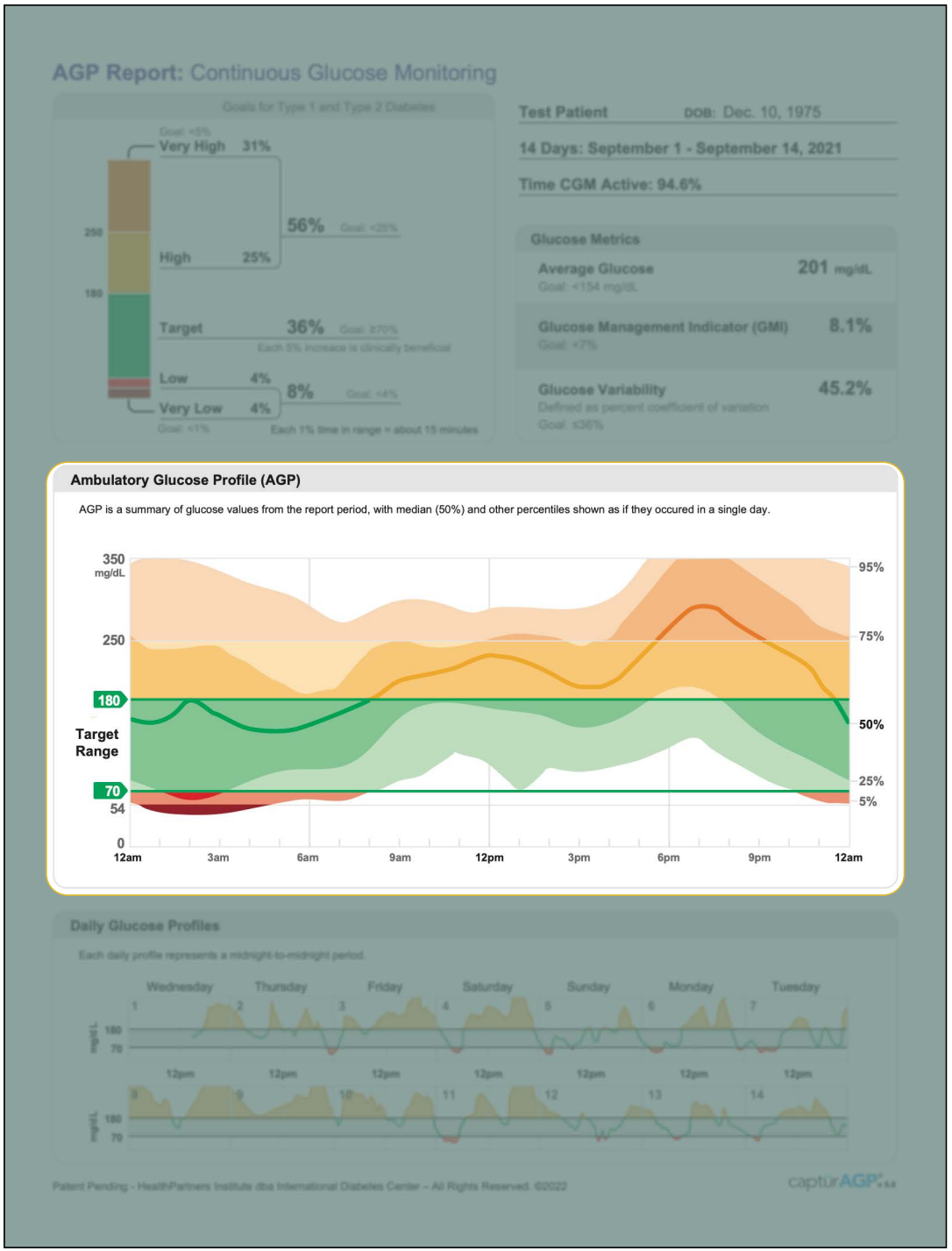

6

Identifying and addressing hypoglycemia

Hypoglycemia may occur in up to 50% of people with type 2 diabetes.[27] Therefore, after checking data capture and confirming adequate data, the next step in a systematic Ambulatory Glucose Profile (AGP) review is to identify hypoglycemia or Time Below Range (TBR). Are blood glucose levels rising, falling, or staying the same? Healthcare providers (HCPs) should talk to their patients and ask them about any activities or actions that may have contributed to their pattern of low glucose.[13]

To address hypoglycemia, review medications (insulin or oral agents, such as sulfonylureas) that can cause hypoglycemia and need to be adjusted accordingly to reduce hypoglycemia when it occurs. Also, consider missed meals, unusual physical activity, and/or alcohol consumption as potential contributors.[13]

Knowing what the blood glucose level is, where it is headed, and how the patient feels – in the context of overall hypoglycemia awareness – is important for using CGM information to prevent hypoglycemia and increase TIR.[13]

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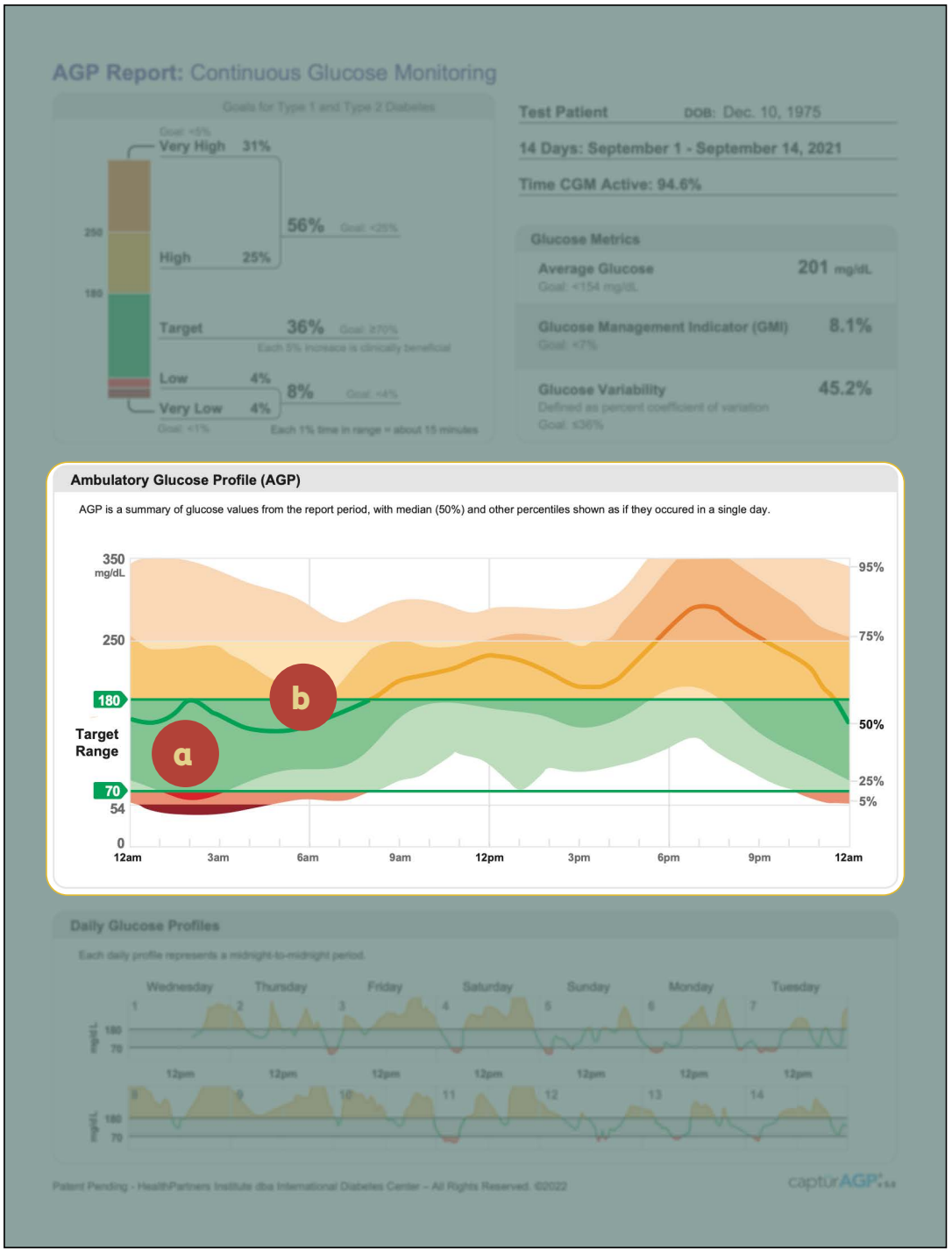

7

Graphic components of the AGP

The “modal” day of the Ambulatory AGP report displays all the glucose readings over a single 24-hour period, allowing clinicians to easily identify suboptimal glucose patterns. The overall trend of the glucose readings is just as important as the actual glucose value and can provide objective criteria to conduct a systematic approach for a more personalized diabetes management plan.[1,7]

(a) Target glucose range

The target glucose range, which is shown as the range between two green parallel lines.[1]

(b) Median glucose line

The median line traces the midpoint glucose reading as a measure of average glucose at each point in the modal day, revealing oscillations and out-of-range values. This is different than the average (mean) glucose, which is simply an arithmetic average. The significance of the median glucose line is that if it remains flat and in the target range throughout the day, that is typically a good sign of glycemic control.[1]

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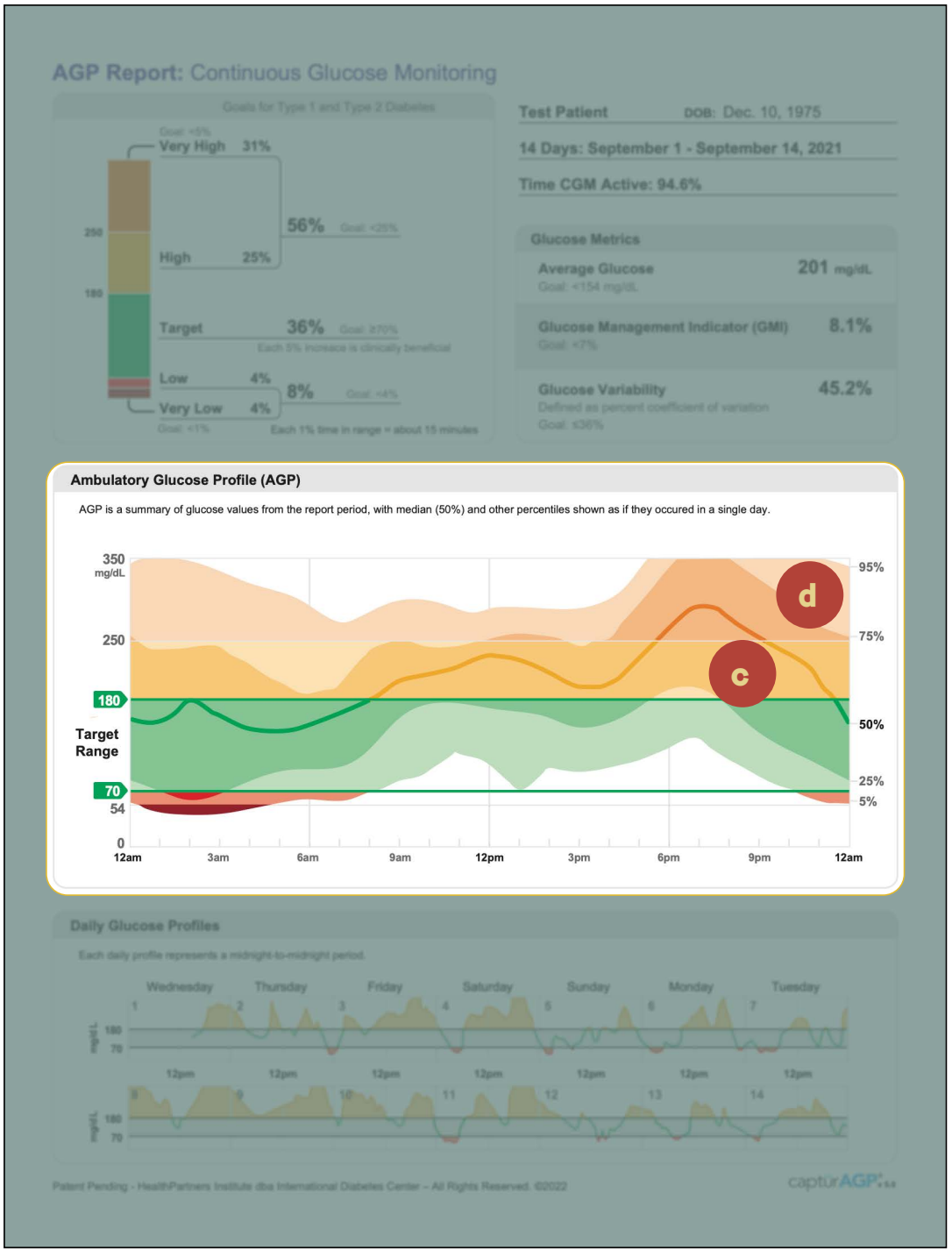

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(c) Interquartile range

The darker shaded band between the 25th and 75th percentiles, known as the interquartile range (IQR), illustrates the 50% of glucose readings closest to the median line. It depicts the variability or oscillations in these readings from day to day, providing insight into daily trends in glucose levels. Additionally, it highlights the impact of medication and mealtimes on glucose control.[1]

(d) Outlier glucose ranges

The outer border areas mark the cutoffs for the 5th and 95th percentile ranges (lowest and highest 5%, respectively), indicative of less common glucose readings. Variability in glucose levels occurs intermittently, offering insights into how behavior and lifestyle factors can influence glucose control. Importantly, the highest and lowest glucose readings (outside of the 5th–95th percentile range) are not included in the AGP. These infrequent values are omitted as they have minimal impact on clinical judgment and decision-making.[1]

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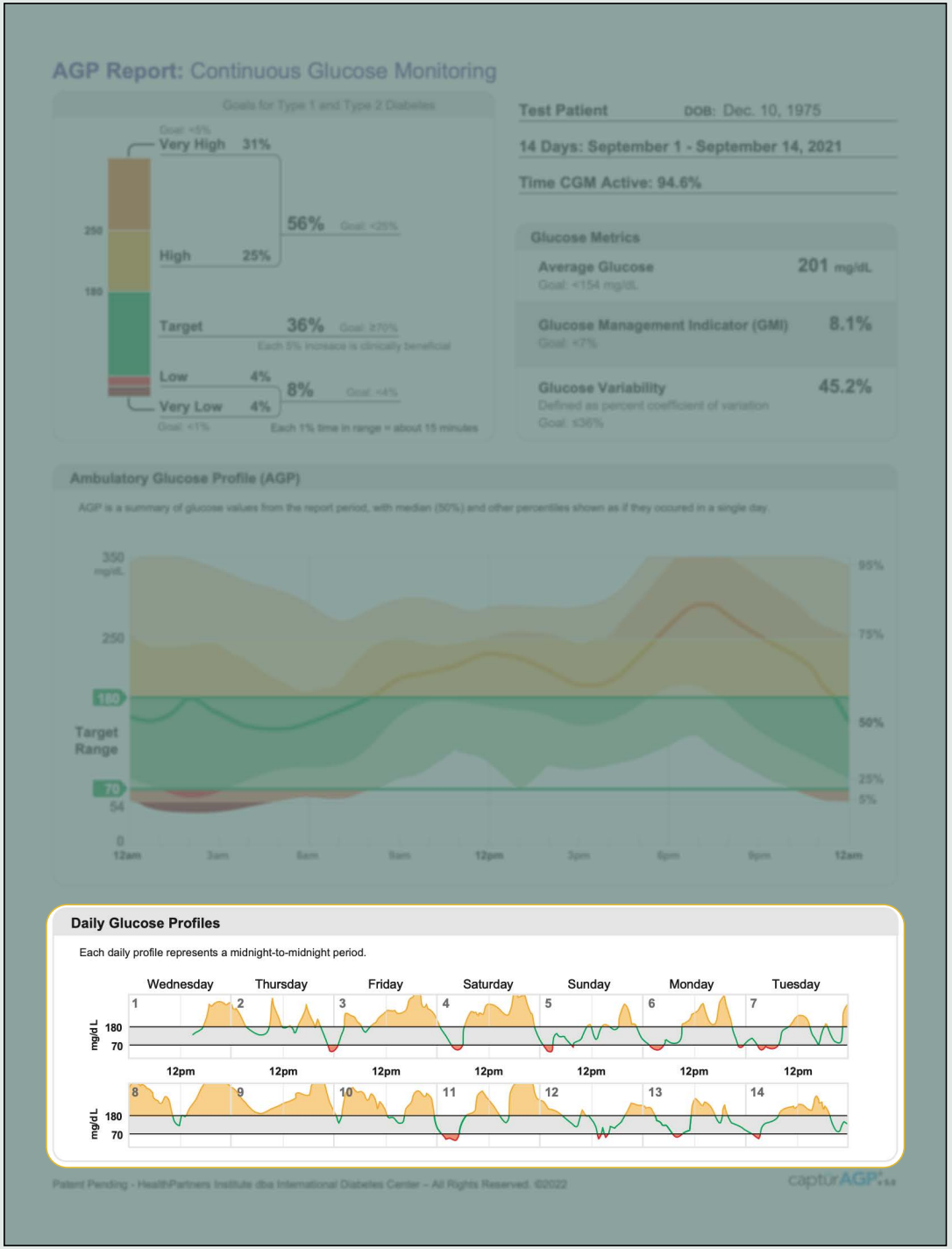

Daily glucose profiles

Daily glucose profiles show the glucose trace for each day of the 14-day AGP. Clinicians can interpret glucose variability within the context of different daily activities and identify on-off events that may have been missed in the overall summary. These on-off events are important calls for contingency planning and education, particularly for illness, busy or stressful days, and other life events.[1]

Alternative CGM reports

Another CGM report, the Glucose Pattern Insights Report (GPIR), is similar to the AGP report but offers a guided interpretation of CGM data. The GPIR highlights areas necessitating clinical attention, offering therapy recommendations and key discussion points on medication and lifestyle considerations to go over with patients. The GPIR is frequently more comprehensible for patients and their care partners but is only offered on certain CGM devices.[28]

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Make sure you don't miss this!

Standard glucose target recommendations are a starting point and ultimately should be individualized for each person.[4]

A generalized interpretation plan of an AGP report should be conducted stepwise:[13,29,30]

1. Evaluate data adequacy
2. Identify and address Time Below Range (TBR)
3. Identify and address high Glycemic Variability (GV)
4. Identify and address Time Above Range (TAR)
5. Improve Time in Range (TIR)

Another CGM report, GPIR, is similar to the AGP report but offers a guided interpretation of CGM data.[28]

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