

# Guide to Continuous Glucose Monitor (CGM) Visualizations

<https://jcst2d.com>  
<https://jcsanalytics.com>

## CGM-Style Visualizations

### Overview

Overview offers a concise summary of glucose control, allowing for a quick assessment without the need to immediately analyze detailed data.

**Note:** The graph aggregates glucose readings into 15-minute intervals.

### Daily View

Daily View offers an in-depth analysis of a patient's glucose data for individual days. It allows users to:

- **Assess** glucose fluctuations throughout the day.
- **Pinpoint** specific times or events that contribute to glucose fluctuations.
- **Understand** how daily activities, meals, or medications influence glucose levels.
- **Detect** recurring patterns on specific days of the week.
- **Investigate** anomalies or unusual glucose events on particular days.

### What is a Compression Low?

A compression low is a false low glucose reading on a CGM caused by pressure on the sensor, such as sleeping on it or compressing it against the body. The pressure pushes interstitial fluid away from the CGM, leading to artificially low readings.

Compression lows typically appear as sharp, brief drops on CGM graphs and are characterized by:

- Sudden, steep drops in CGM readings.
- Readings returning to normal once pressure is removed.

It's important to be aware of compression lows to avoid unnecessary treatment for hypoglycemia and to ensure accurate glucose monitoring, especially during sleep.

[https://public.tableau.com/views/CGMDATA/ContinuousGlucoseMonitorCGMDATA?:language=en-US&:sid=&:redirect=auth&:&display\\_count=n&:origin=viz\\_share\\_link](https://public.tableau.com/views/CGMDATA/ContinuousGlucoseMonitorCGMDATA?:language=en-US&:sid=&:redirect=auth&:&display_count=n&:origin=viz_share_link)

! These visualizations are part of a data visualization exercise in Tableau. The data are observational and not intended to guide treatment decisions. Individual results may vary.

### Profile

Profile is a standardized, single-page report that offers a comprehensive overview of glucose management, modeled after the proprietary Ambulatory Glucose Profile (AGP) report. The report has several key components, including:

- **Glucose Profile:** Offers a 24-hour view of glucose patterns, which combines data from multiple days. It displays the 5th (5%), 25th (25%), 50th (50%), 75th (75%), and 95th (95%) percentiles.
- **Glucose Metrics:** Displays average glucose levels, the glucose management indicator (GMI), and glucose variability.
- **Daily Glucose Charts:** Presents single-day glucose charts for more detailed analysis.
- **Time in Range:** Visualizes the percentage of time spent in various glucose ranges using color-coded bars. Each 1% equates to approximately 15 minutes within a specific glucose range.

**Note:** The graph uses readings aggregated into one-hour intervals.

### Comparison

Comparison allows users to analyze glucose data across two time periods. This side-by-side comparison helps with:

- **Evaluating** overall progress in glucose management.
- **Visualizing** specific changes, such as the impact of medication adjustments.
- **Monitoring** improvements in both short-term and long-term diabetes management.

**Note:** The graphs aggregate glucose readings into 15-minute intervals.

### Overlay

Overlay displays seven days of blood glucose readings on a single 24-hour graph. It allows users to:

- **Identify** consistent patterns at the same times on multiple days.
- **Visualize** day-to-day variability in glucose levels.
- **Detect** specific time periods where glucose levels tend to rise or fall.

The primary purpose of the Overlay report is to provide insight into the frequency, duration, and intensity of glucose patterns, particularly hypoglycemia and hyperglycemia.

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## Data Analysis Style Visualizations

### Time in Range by Hour

Displays the percentage of time glucose levels fall within a specified target range—either 70–180 mg/dL or 70–140 mg/dL—for each hour of the day.

It provides valuable insight into daily glucose patterns by:

- **Showing** when glucose levels tend to rise or fall.
- **Revealing** recurring trends, such as post meal spikes or overnight stability.
- **Supporting** comparisons across different thresholds, such as 70–180 mg/dL and 70–140 mg/dL.

The selected range is shown in the chart title. This visualization adds context to Time in Range (TIR) by focusing on when fluctuations occur—not just how often.

Reviewing TIR by hour can help:

- **Pinpoint** times that may benefit from therapeutic adjustments.
- **Visualize** the effect of meals, medication timing, or sleep patterns on glucose control.

### Variation by Hour

Presents the Coefficient of Variation (CV) grouped by hour of the day. CV is calculated as the standard deviation divided by the mean glucose level for each hour and reflects the relative amount of glucose variability.

This chart allows users to:

- **Identify** hours with higher glucose variability, which may signal inconsistent meal timing, medication effects, or physical activity.
- **Compare** stability across different times of day, such as overnight vs. post-meal periods.
- **Inform** timing of therapeutic interventions, such as adjusting insulin or medication schedules.

CV is a useful measure because it standardizes variability regardless of average glucose levels. A CV above 36% is often considered high and may warrant further review.

### Why These Visualizations Matter

Traditional Time in Range summaries show *how often* glucose stays in range—but not *when* levels rise or fall. That missing detail can make important patterns harder to recognize and act on.

Time in Range by Hour addresses this by showing the percentage of time glucose falls within range for each hour of the day. Variation by Hour complements it by showing how consistent or erratic glucose levels are during the same time periods. Together, they provide a more complete view of daily patterns—revealing when glucose is most stable and when it tends to shift.

Both charts use the same reversed green-blue color scale: greener tones indicate more time in range or lower variability, while bluer tones highlight areas with less control or greater fluctuation. This framing helps focus attention without assigning judgment.

These visualizations support more informed decisions—whether you’re adjusting therapy, reviewing daily routines, or analyzing trends. They replace judgment with clarity and turn summary metrics into something actionable.

## Common Measures

### Glucose Metrics

Displays key measurements for the selected date range, including the following:

#### Average Glucose

The mean of all glucose readings from the selected date range.

#### Coefficient of Variation (CV)

The glucose standard deviation divided by the mean glucose. CV is a standardized measure that assesses the magnitude of glucose variability.

#### Glucose Management Indicator (GMI)

An approximation of the A1c level expected, based on average glucose measured by CGM.

#### Standard Deviation (SD)

Represents glycemic variability by showing how much CGM readings rise and fall from the average.

#### Time CGM Active

The number of readings divided by the number of expected readings for the selected period, displayed as a percentage.

#### Days with CGM Data

The number of days for the selected time period with at least 50% (144/288) sensor readings.

### Time in Range

Displays the percentage of time that glucose levels fall within the specified ranges. Data is shown both as text and in a stacked bar graph.

**Very High:** Above 250 mg/dL

**High:** 181–250 mg/dL

**In Range:** 70–180 mg/dL

**Low:** 54–69 mg/dL

**Very Low:** Below 54 mg/dL

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