Let's Go DIGITAL

For more information, click on any letter of the **DIGITAL** acronym or the ⓘ icon.

Interpretation of Connected Insulin Pen (CIP) Reports

Using these **DIGITAL** steps can help you standardize and streamline your approach to reviewing CIP reports, interpreting the data, and generating effective treatment decisions.[1]

CLICK
to learn more about CIPs

D ownload the report
CIP reports may be generated from an HCP portal or requested from the patient.

I ndividualize glycemic targets[2]
Determine individualized glycemic goals with each patient.

G lucose metrics[1]
Identify targets for:

- Continuous glucose monitor (CGM) users
- Blood glucose monitor (BGM) users ⓘ

I nsulin metrics[1]
Identify dosing totals:

- Basal insulin
- Mealtime insulin
- Correction insulin

Calculate the basal/mealtime insulin ratio.

T iming of doses[1]
Examine the daily logbook section for specific doses and timing.

- Basal dose(s)
- Meals and mealtime insulin
  - Missed doses ⓘ
  - Mistimed doses ⓘ
- Corrections

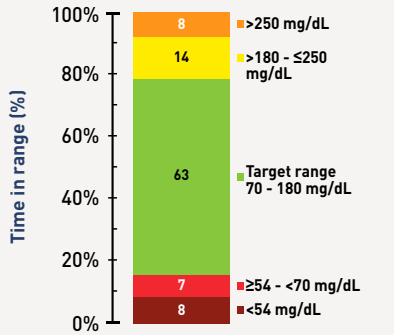
A nalyze and adjust[1]
Use identified patterns to adjust basal and mealtime insulin. Patients may struggle with glucose variability, despite a high time in range (TIR).

- Recognize glycemic patterns

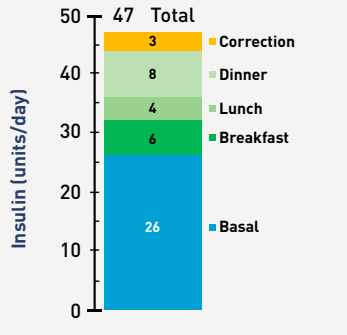
L everage shared decision-making[2]
Shared decision-making is key to empowering a person with diabetes.

- Establish a collaborative relationship to support diabetes self-management
- A CIP not only connects insulin and glucose data, but also the HCP and patient

Example CIP Report[1]



- Mean glucose ± SD
- %CV
- Glucose management indicator (%)



- Total daily dose=units/day mean (SD)
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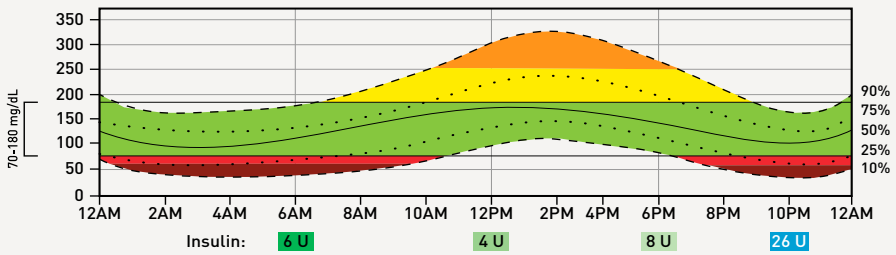
- Premeal doses/day mean (SD)
- Correction doses/day mean (SD)



Technology Usage

• Number of doses/day	mean ± SD	• Correction doses/day	mean ± SD
• % dose overrides	_____	• % missed doses	mean ± SD
• % use of CGM	_____	• % use of CIP	_____

Lifestyle

• Meals/day	mean ± SD	• Sleep (hours)	mean ± SD
• Carbohydrate (g/day)	mean ± SD	• Exercise (min/day)	mean ± SD
		• Exercise (steps/day)	mean ± SD

Alerts

	Hypoglycemia ≤70 mg/dL	Hyperglycemia >180 mg/dL
• Alerts/day	mean ± SD	mean ± SD
• Daytime alerts	mean ± SD	mean ± SD
• Nighttime alerts	mean ± SD	mean ± SD

Clinical Insights: _____

_____

BGM = blood glucose meter; CGM = continuous glucose monitor; CIP = connected insulin pen; CV = coefficient of variation; HCP = healthcare professional; SD = standard deviation; TIR = time in range.

1. Rodbard D, Garg SK. *Diabetes Technol Ther.* 2021;23(3):221-226. 2. ElSayed NA, et al. *Diabetes Care.* 2023;46(suppl 1):S1-S291.

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CIPs

A CIP automatically captures insulin dose data and sends this information to a compatible smartphone application. There are currently 3 options for a CIP.

Reusable Smart Pen	Smart Button	Smart Cap
		

The data captured within a patient's CIP smartphone app may be reviewed on an HCP platform, allowing the integration of insulin data from the CIP and glucose data from a CGM or BGM device.

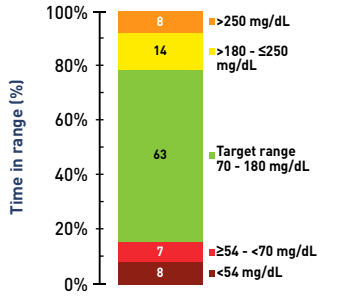
ElSayed NA, Allepo G, Aroda VR, et al. *Diabetes Care*. 2023;46(suppl 1):S1-S291.

Download the report

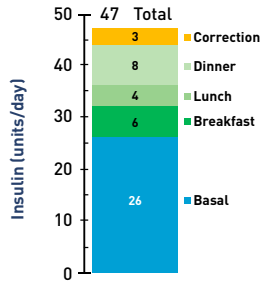
CIP reports may be generated from an HCP portal or requested from the patient.

- Upload the PDF directly into the electronic health records
- Print and scan the report
- Use your computer's snipping tool to paste relevant images directly into an HCP clinic note

Summary Report



- Mean glucose ± SD
- %CV
- Glucose management indicator (%)



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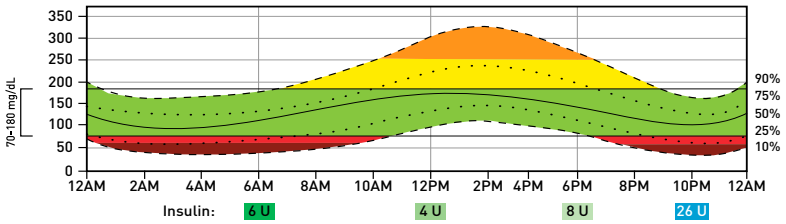

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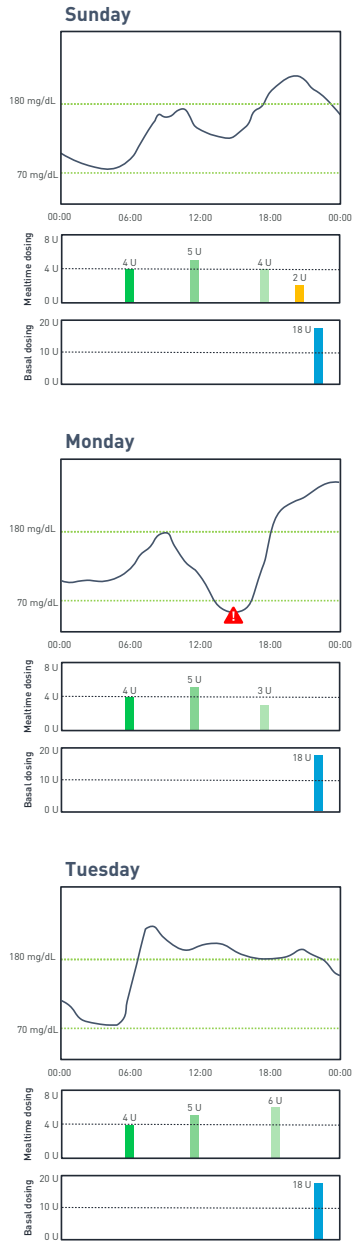
Clinical Insights: _____

_____

Daily Log



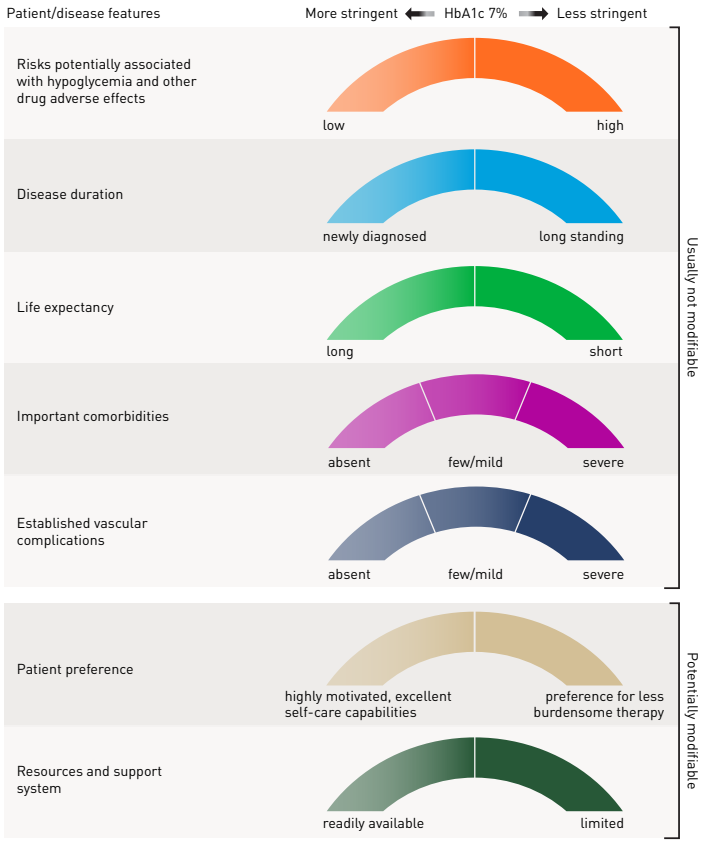
Rodbard D, Garg SK. *Diabetes Technol Ther*. 2021;23(3):221-226.

Individualize glycemic targets[1]

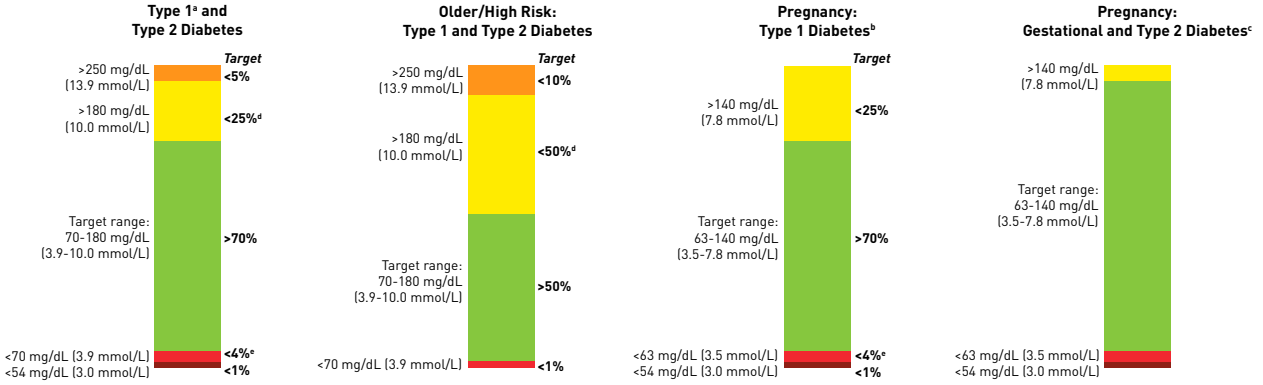
Determine individualized glycemic goals with each patient.

- Use published recommendations for individualization of care
- Provide guidance or alternate targets

Approach to Individualization of Glycemic Targets



CGM-Based Targets for Different Diabetes Populations[2]

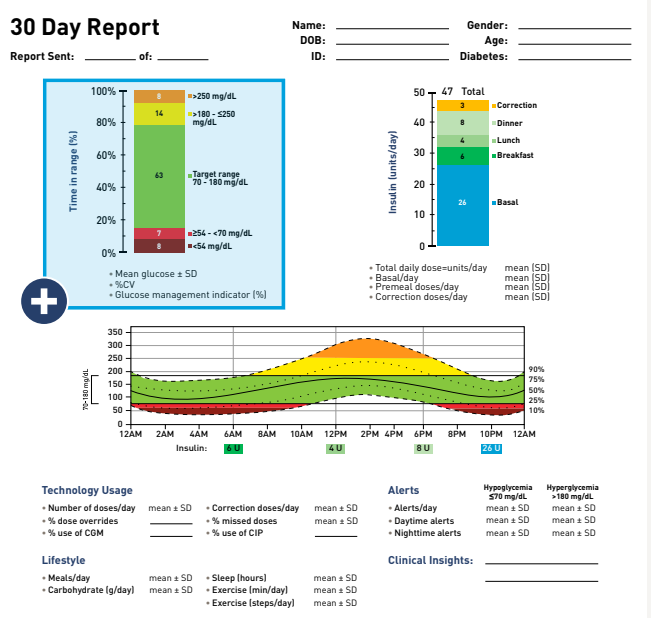


[a]For ages <25 years, if HbA1c goal is 7.5%, then set TIR target to approximately 60%. [b]Percentages of TIR are based on limited evidence. More research is needed. [c]Percentages of TIR have not been included here because there is very limited evidence in this area. More research is needed. [d]Includes percentage of values >250 mg/dL. [e]Includes percentage of values <54 mg/dL.
HbA1c = glycated hemoglobin.

1. ElSayed NA, Allepo G, Aroda VR, et al. *Diabetes Care.* 2023;46(suppl 1):S1-S291. 2. Battelino et al. *Diabetes Care.* 2019;42(8):1593-1603.

Glucose metrics[1]
CGM users

- Identify the following:
  - Glucose management indicator
  - % time in, above, and below range
  - % coefficient of variation
  - Standard deviation
- Target goal of >70% CGM usage
- Individualize care



Standardized CGM Metrics for Clinical Care[2]

Metric	Description	Target
Number of days CGM device is worn		Recommended 14 days
Percentage of time CGM device is in use		Recommended 70% of data from 14 days
Mean glucose		
Glucose management indicator (%)	Estimated HbA1c based on CGM-derived glucose readings[3]	
Glycemic variability (% CV)		≤36%
TAR: % of readings and time >250 mg/dL	**Level 2 hyperglycemia**	<5%
TAR: % of readings and time 181-250 mg/dL	**Level 1 hyperglycemia**	<25%
TIR: % of readings and time 70-180 mg/dL	**In range**	>70%
TBR: % of readings and time 54-69 mg/dL	**Level 1 hypoglycemia**	<4%
TBR: % of readings and time <54 mg/dL	**Level 2 hypoglycemia**	<1%

TAR = time above range; TBR = time below range.

1. Rodbard D, Garg SK. *Diabetes Technol Ther.* 2021;23(3):221-226. 2. ElSayed NA, Allepo G, Aroda VR, et al. *Diabetes Care.* 2023;46(suppl 1):S1-S291. 3. Bergenstal RM, Beck RW, Close KL, et al. *Diabetes Care.* 2018;41(11):2275-2280.

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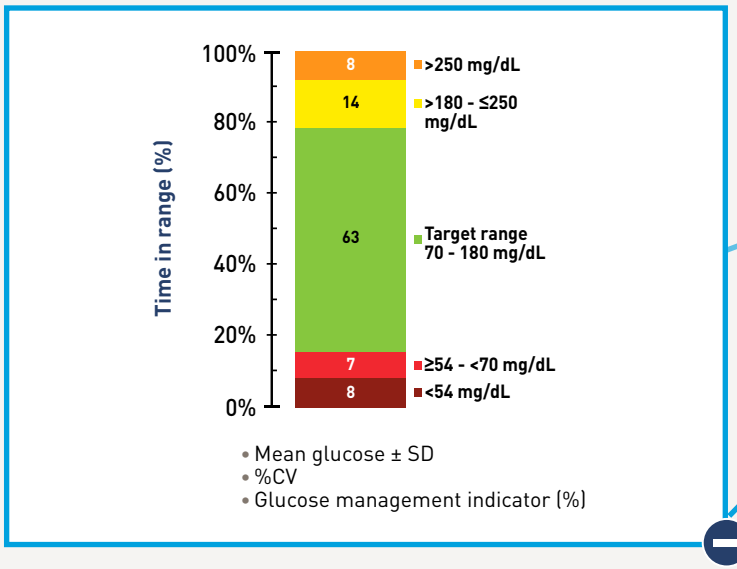

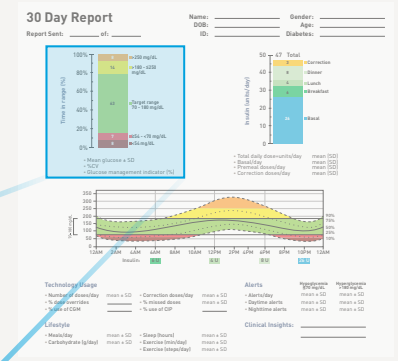

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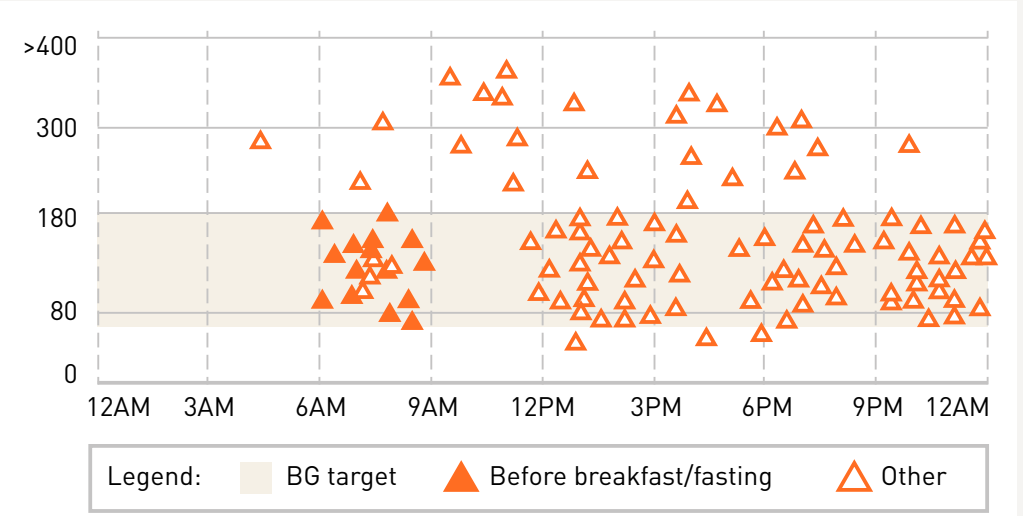
Glucose metrics[1]

BGM users

Encourage patients to test their glucose frequently to ensure you have the data needed to make informed treatment decisions.

- Prior to meals and snacks (and occasionally after)
- At bedtime
- Prior to physical activity
- When they suspect hypoglycemia or hyperglycemia
- After treating hypoglycemia until they are normoglycemic
- Prior to and while performing critical tasks like driving

For many individuals using BGM, this requires checking up to 6-10 times daily, although individual needs may vary.



Glycemic Recommendations for Nonpregnant Adults With Diabetes[2]

HbA1c	<7.0% (53 mmol/mol)*,#
Preprandial capillary plasma glucose	80-130 mg/dL* (4.4-7.2 mmol/L)
Peak postprandial capillary plasma glucose†	<180 mg/dL* (10.0 mmol/L)

Estimated Average Glucose[2]

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)

*More or less stringent glycemic goals may be appropriate for individual patients. #CGM may be used to assess glycemic target. Goals should be individualized based on duration of diabetes, age/life expectancy, comorbid conditions, known cardiovascular disease or advanced microvascular complications, hypoglycemia unawareness, and individual patient considerations.†Postprandial glucose may be targeted if HbA1c goals are not met despite reaching preprandial glucose goals. Postprandial glucose measurements should be made 1-2 hours after the beginning of the meal, generally peak in people with diabetes.**These estimates are based on HbA1c-derived average glucose data of ~2700 glucose measurements over 3 months per HbA1c measurement in 507 adults with type 1, type 2, or no diabetes. The correlation between HbA1c and average glucose was 0.92.
BG = blood glucose.

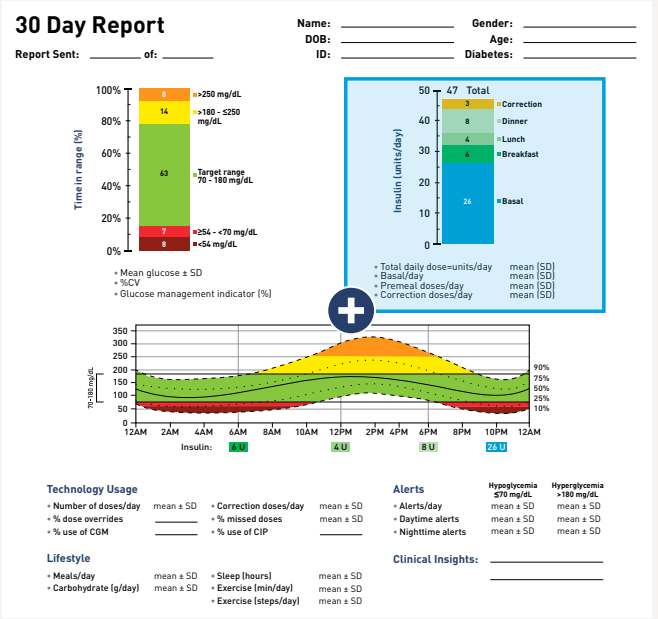
1. Rodbard D, Garg SK. *Diabetes Technol Ther.* 2021;23(3):221-226. 2. ElSayed NA, Allepo G, Aroda VR, et al. *Diabetes Care*. 2023;46(suppl 1):S1-S291.

Insulin metrics[1]

Identify dosing totals

- Basal insulin doses
- Mealtime insulin doses
- Correction insulin doses
- Basal/mealtime ratio

Total daily insulin requirements can be estimated based on weight, with typical doses ranging from 0.4 to 1.0 units/kg/day. Higher amounts are required during puberty, pregnancy, and medical illness. Generally, 50% of daily insulin should be basal and 50% should be prandial, but this ratio is dependent upon a number of factors.[2]



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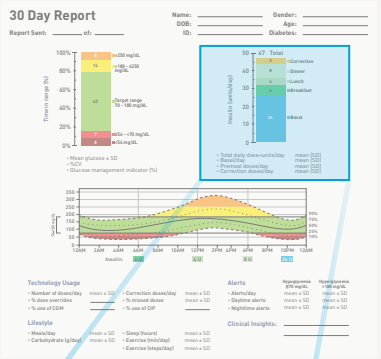
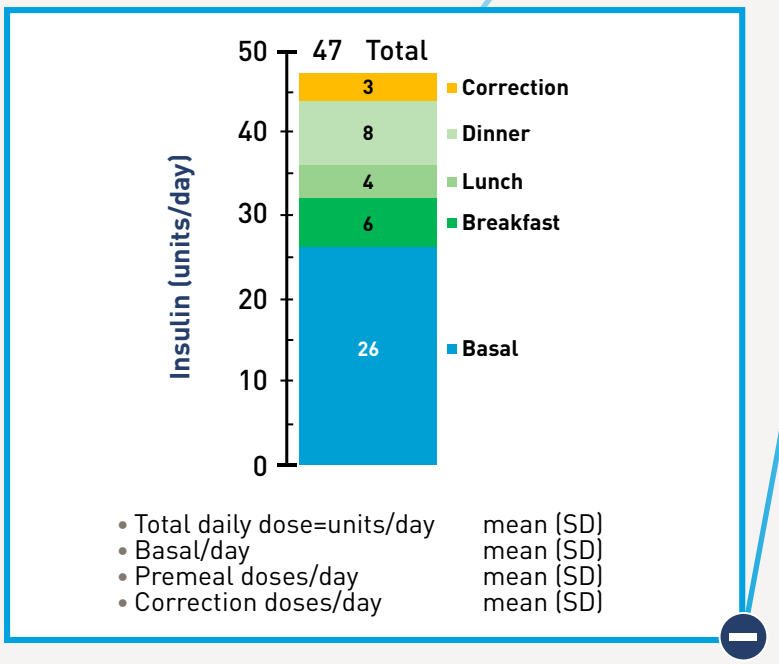


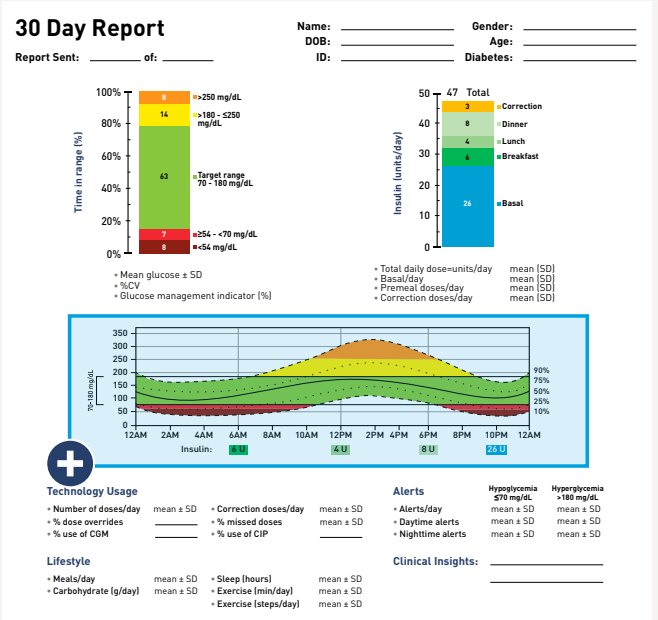


D I G I (2 of 2) T A L

1. Rodbard D, Garg SK. *Diabetes Technol Ther.* 2021;23(3):221-226. 2. ElSayed NA, Allepo G, Aroda VR, et al. *Diabetes Care.* 2023;46(suppl 1):S1-S291.

Timing of doses

Examine the daily logbook section for specific doses and timing. Recognize insulin dose timing and its effect on glucose values. The impact of suboptimal dosing is not limited to hyperglycemia and may contribute to the frequency of hypoglycemia.



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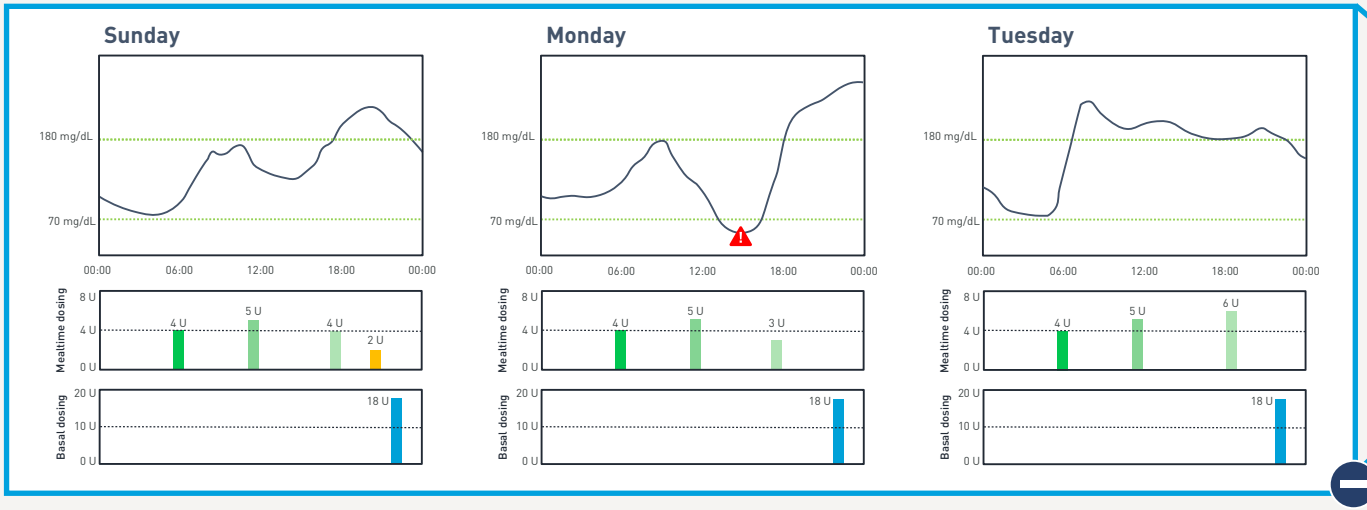

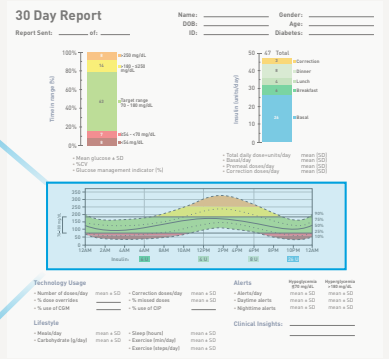

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Missed doses

Mistimed doses

D I G I T A L

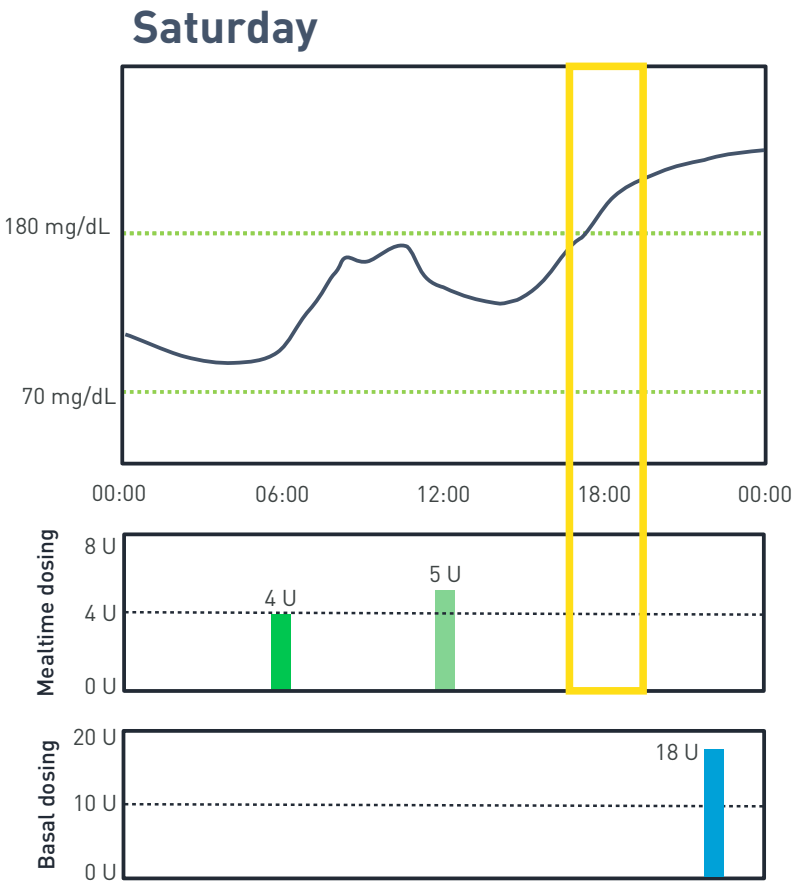
T (2 of 4)

Rodbard D, Garg SK. *Diabetes Technol Ther.* 2021;23(3):221-226.

Timing of doses

Missed doses

In the highlighted example, even though the person's glucose levels increased around dinnertime, consistent with them eating a meal, there are no insulin doses recorded after lunch until a basal dose at bedtime. These data indicate that this person missed their predinner mealtime insulin dose.



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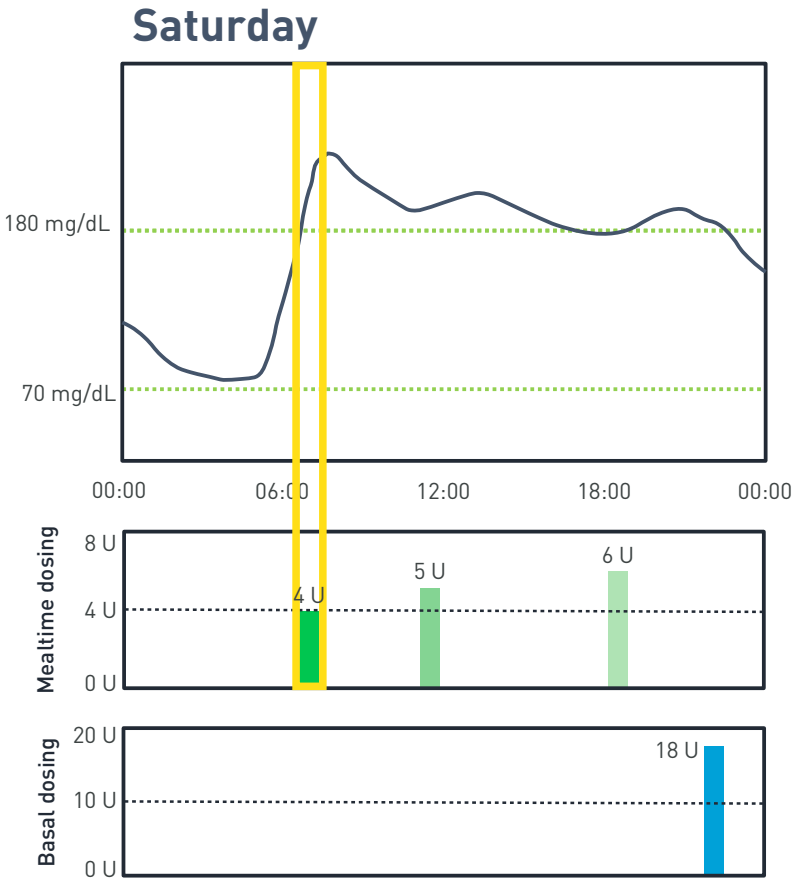
Timing of doses:
Mistimed doses

In the highlighted example, the person's glucose levels were rising before they took their insulin, indicating they had eaten their morning meal before their premeal dose.

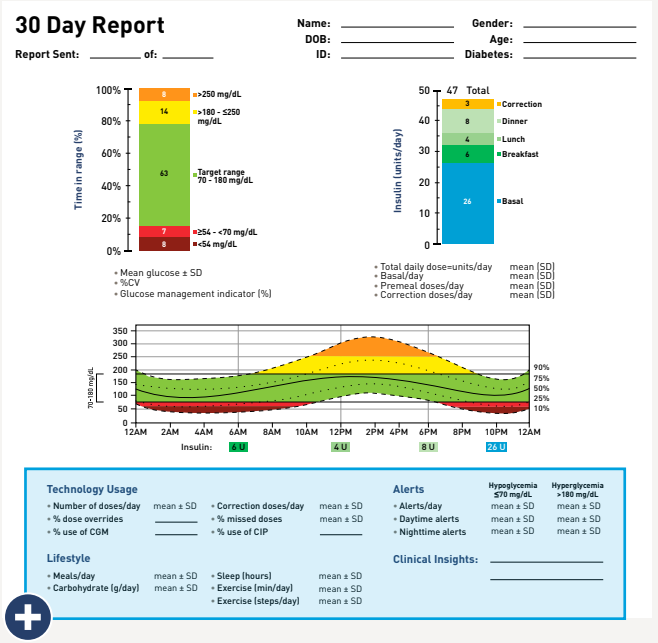


Rodbard D, Garg SK. *Diabetes Technol Ther.* 2021;23(3):221-226.

Analyze and adjust[1]

Recognize glycemic patterns

- Use identified patterns to adjust basal and mealtime insulin
- Prioritize addressing hypoglycemia and TBR
- Compare the current report to the one from the last visit to evaluate the impact of the previously implemented treatment plan
- Assess for achievement of individualized glycemic targets
  - TIR
  - Average glucose
  - CV
- Identify inadequate doses and contributing factors:
  - Inaccurate carbohydrate counting
  - Fear of hypoglycemia (including nocturnal, social, or work settings)
  - Insulin management surrounding physical activity
  - Using fixed doses instead of meal-to-meal adjustment
  - Anxiety about the stigma surrounding diabetes



D I G I T A L (1 of 2)

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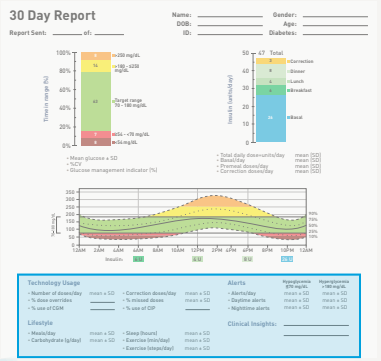

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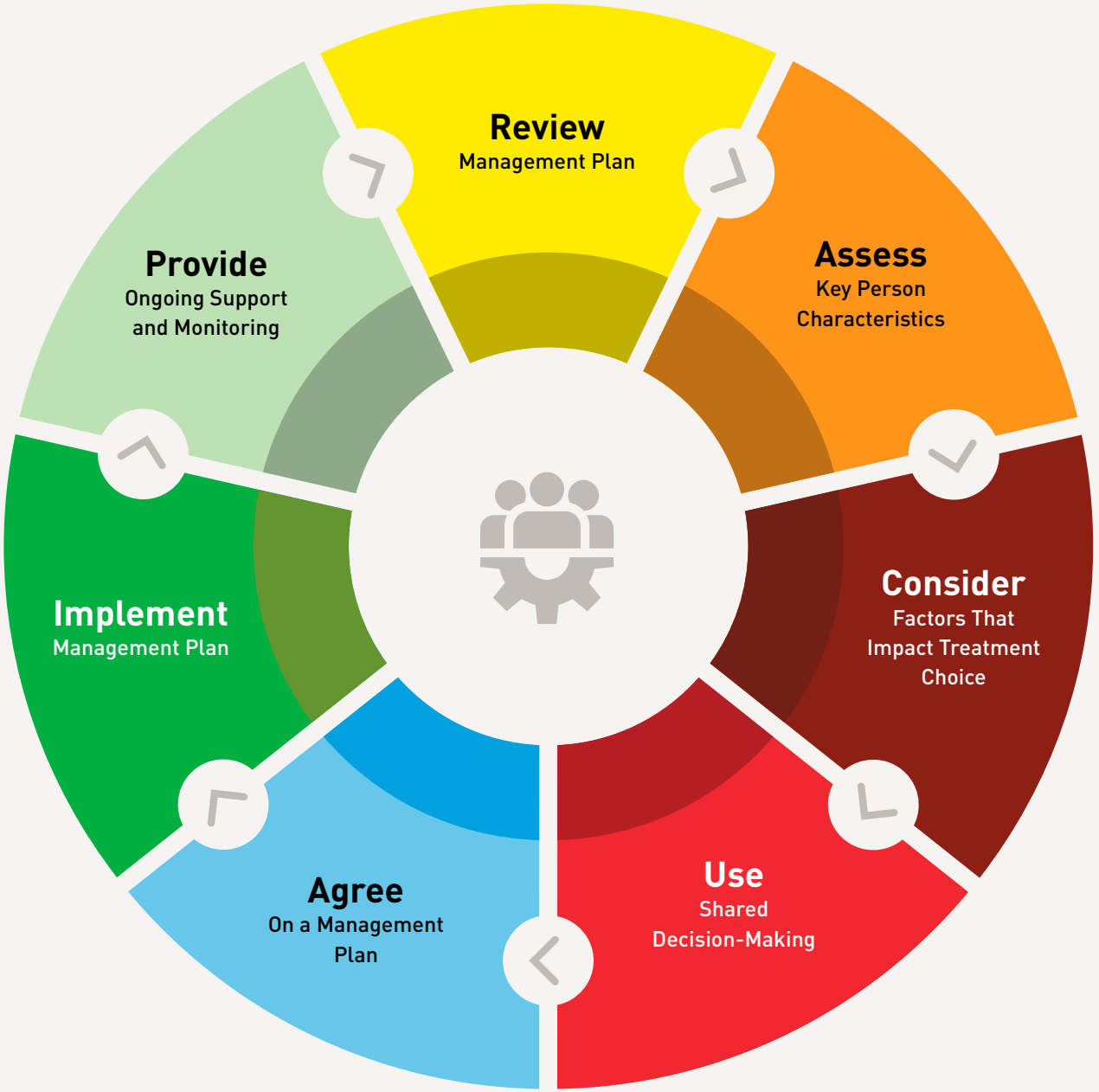
Leverage shared decision-making

Person-centered glycemic management and shared decision-making are cyclical processes. Treatment decisions should be regularly reassessed.

Shared decision-making is key to empowering a person with diabetes.

- Establish a collaborative relationship to support diabetes self-management
- A CIP not only connects insulin and glucose data, but also the HCP and patient



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