



## HCP Discussion Guide

# Getting started with Time in Range and why it matters

**Time in Range is a practical new diabetes tool that can empower people living with diabetes to improve their daily diabetes management and enable their HCPs to make informed treatment decisions.<sup>1-3</sup> Many HCPs believe that time in range is changing the course of diabetes management, and could become the future diagnostic standard.<sup>4</sup>**

The following Q&A serves as a discussion guide to help you explain the value of time in range to your patients. It will support conversations about the added value of time in range on top of the information provided by the HbA<sub>1c</sub> test. It can support you to help patients understand why time in range matters and also encourage them to get started.<sup>2,3</sup>

The objective is to overcome barriers that patients might have, such as starting with a continuous glucose monitoring device (CGM), particularly fears about information overload, not being able to understand time in range, confusion and interference with lifestyle choices, etc.

Exploring personal worries and drivers, as well as a patient's goals in relation to their diabetes management and how CGM and time in range might help achieve these, could be paramount in creating a positive mindset and a willingness to engage with CGM and time in range.<sup>5</sup> CGM and time in range have the potential to improve self-management and medication adherence, which can consequently improve outcomes.<sup>2,6,7</sup>

# 1. How much do you know about time in range?

## Explaining time in range, time above range (TAR) and time below range (TBR)

- **What is time in range:** Time in range is a measure that shows how long you spend in your target blood sugar (glucose) range using the numbers from a continuous glucose monitor device or CGM device.<sup>2</sup> For most people, the target blood glucose range is between 70 and 180 mg/dL (3.9–10 mmol/L), and spending at least 70%<sup>†</sup> of the day with your blood sugars within this range matches an HbA<sub>1c</sub> of 6.7–7%.<sup>2,8,9</sup> For the specific target ranges that apply to different populations, please see the footnote at the end of this page, and share the details where appropriate.\*
- **How do you read time in range:** Time in range shows the percentage of time your blood glucose is within your target range over a period of time, usually 14 days.<sup>2</sup> You can see your time in range in a one-page report generated by your CGM device called the Ambulatory Glucose Profile, or AGP, which needs 14 days of blood glucose readings to create.<sup>2,6</sup> Your AGP is a coloured visual summary of all your 24-hour blood glucose readings. We can take a look at this together, and you can learn how to read it yourself.<sup>2,10,11</sup>
- **What are time in range, time above range (TAR) and time below range (TBR):** Your blood glucose is always either in, above or below range at all times. TAR is when your blood glucose is too high (hyperglycaemia) and TBR is when your blood glucose is too low (hypoglycaemia).<sup>2</sup>

## Explaining what time in range adds to HbA<sub>1c</sub>

- **Shows glucose fluctuations:** Time in range shows your blood glucose peaks and dips – the hypos and hypers – for each day and night, over the whole 14 days of the AGP report.<sup>2,11</sup> The HbA<sub>1c</sub> test only shows your average blood glucose levels for the past 2–3 months.<sup>1,3</sup>
- **Why glucose variability is important:** We know that blood glucose peaks and dips, within the day and in between days, can result in short and long-term complications for people with diabetes.<sup>3</sup> Many experts now believe this variation in blood glucose (known as glucose variability) is a more meaningful measure of your diabetes management than HbA<sub>1c</sub> and time in range, as shown by CGM measurements, lets us see this variability.<sup>2,3,11</sup>
- **More complete picture:** HbA<sub>1c</sub> is useful for predicting the long-term risk of diabetes complications from hypers, but a CGM device also tells you about your hypos, hypers and optimal glucose management, and therefore gives you a more complete picture of your blood glucose levels.<sup>1,3</sup>

## Explaining why time in range matters

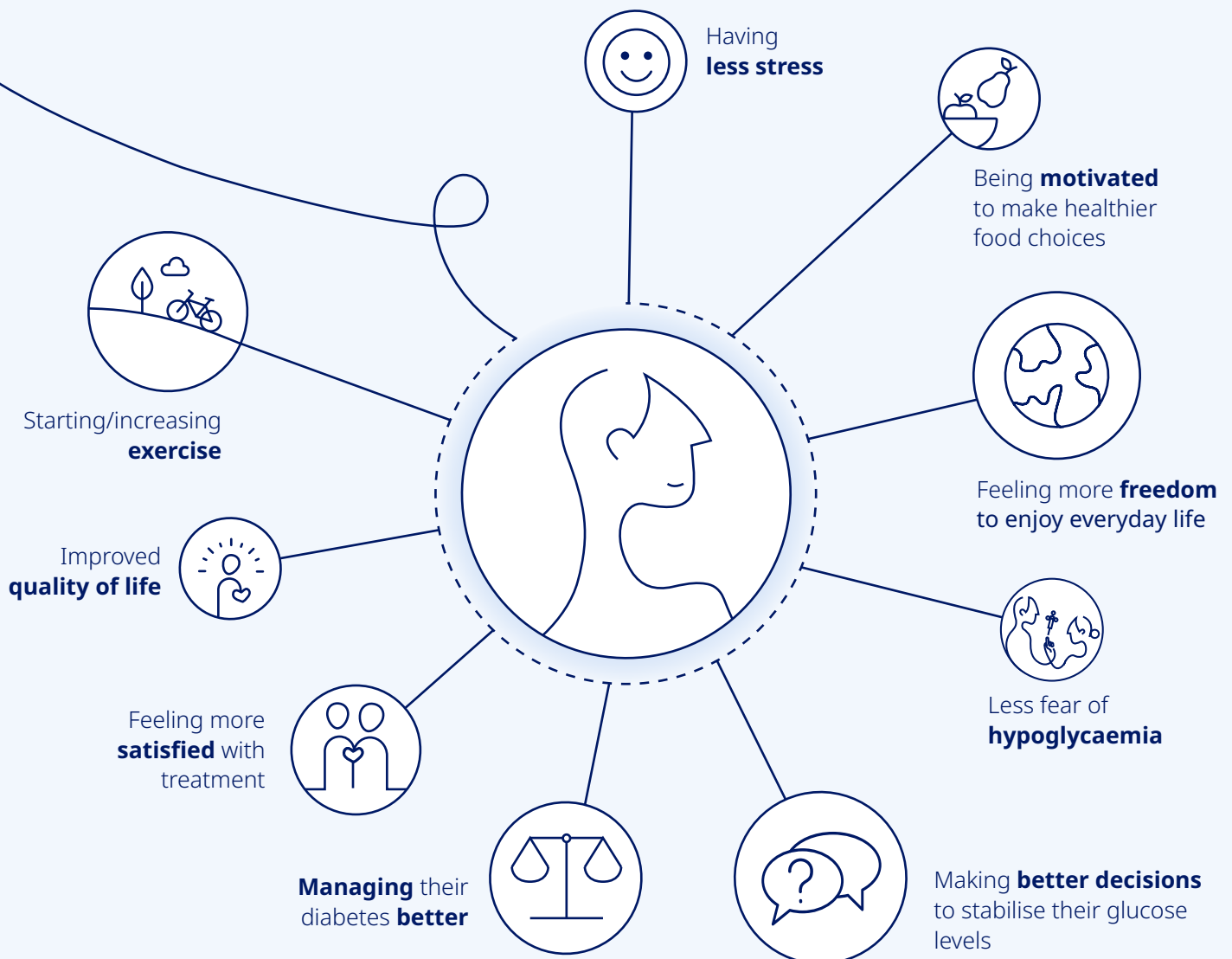
- **Reduce complications:** Increasing time in range is associated with reduced risk of numerous diabetes-related health complications, such as eye and kidney issues and heart and circulation problems.<sup>6,12–18</sup>
- **Improves diabetes management:** A CGM device could help take your diabetes management to the next level – think of it like ‘fine-tuning’ your diabetes management.<sup>2</sup> We can keep a closer eye on your blood glucose, spot any patterns in the peaks and dips, and pinpoint where medication might need to be adjusted.<sup>2</sup> We can also see how specific foods or exercise affect your blood glucose. With all this information, we can quickly make changes to help stabilise your blood glucose levels so you spend more time in your target blood glucose range.<sup>2</sup>
- **Allows us to set goals:** Time in range gives us specific goals to work towards that can help you achieve optimal diabetes management goals. The goal is to spend at least 17 hours of your day in range (that’s 70% of the time). You should also aim to spend less than 1 hour below range (less than 4% of time in hypoglycaemia) and less than 6 hours above range (less than 25% of time in hyperglycaemia).<sup>2</sup> We can work towards this goal together – you can take control with changes to your lifestyle (food, exercise etc.) and I can advise on any necessary medication changes.<sup>2</sup>

\* Target ranges and their target daily durations for different populations: Older/high risk patients with T1D and T2D; 70–180 mg/dL (3.9–10.0 mmol/L); aim for >50% of day in range (<12hrs). Pregnant with T1D; 63–140 mg/dL (3.5–7.8 mmol/L); aim for >70% day in range (>16 hrs 48 min). Pregnant with gestational diabetes or T2D; 63–140 mg/dL (3.5–7.8 mmol/L); daily duration N/A.<sup>2</sup> † >70% of a 24-hr day is equivalent to >16 hrs 48 minutes.

## 2. Living with diabetes can be challenging; what would you like to change or achieve, and what do you have hopes for?

Time to explore and ask your patient about their personal goals. Consider whether a CGM device and time in range could support them. The following insights might help:

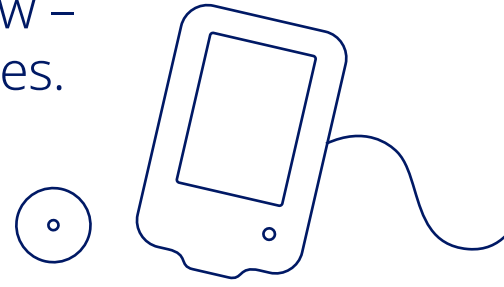
### Personal goals achieved by people with diabetes using time in range\*<sup>10,17-20</sup>



\* Includes patient responses from an independent qualitative research study.<sup>10</sup>

- **Keeping on track:** Time in range could help you to plan ahead, and your AGP report can help keep you motivated and on track with eating habits.<sup>2,17</sup>
- **Engaging with management:** Because time in range helps you make specific and concrete goals, you are likely to become more involved in your diabetes management.<sup>2</sup>
- **Feeling emotional relief:** Having more detailed information about your blood glucose management means time in range can relieve significant stress and worry.<sup>17,19,20</sup>

3. It's often difficult starting something new – especially when it comes to your diabetes. Is there anything you're not sure about when it comes to time in range?



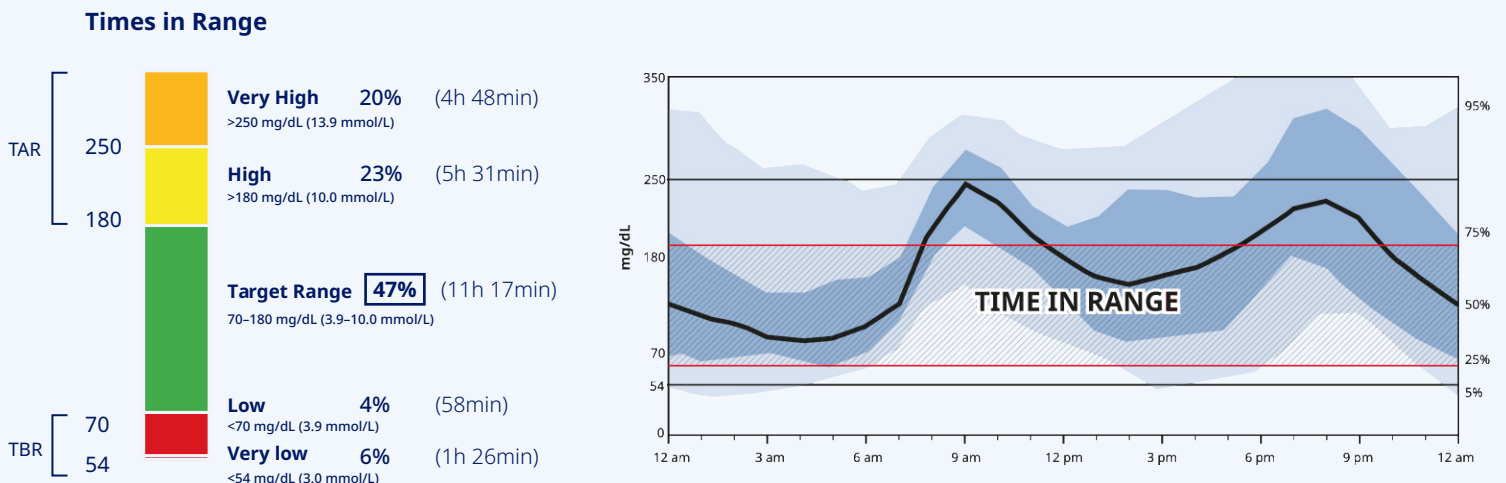
### Addressing concerns about CGM

- **I am not sure about round-the-clock monitoring!** A CGM device takes glucose measurements every 1 to 5 minutes around the clock, so you can see your levels in real-time, anytime, day and night.<sup>1</sup> Many models have alarms that sound when you are going into a hypo or hyper so you can take action to avoid these, meaning a CGM device could help you feel safer.<sup>1</sup>
- **I don't want more needles!** Modern CGM devices are small and don't have needles; just a thin sensor inserted under your skin, from where they measure blood glucose in the body fluid (interstitial fluid) between your blood cells.<sup>21</sup> They are worn on your arm or tummy, and the ability to monitor blood glucose levels more frequently is one of their main benefits.<sup>21</sup> In an independent patient research study, having few finger pricks was reported as a big motivator for starting with a CGM.<sup>10</sup>
- **I don't want any more restrictions in life!** CGMs are easy to apply yourself and you can continue with all your usual everyday activities – including swimming and bathing. A CGM doesn't restrict your lifestyle or eating habits.<sup>21,22</sup>

### Addressing concerns about understanding the AGP and reading time in range

- **I'm not sure I can understand the AGP!** The AGP is in sections to make it easy to read. It shows how much time you spent in, above and below your target glucose range during a 14-day period, in traffic light colours. Your time in range is shown in green, time below range (TBR) is red and time above range (TAR) is yellow and amber.<sup>2</sup>
- **It sounds too complicated!** We can read the AGP together at appointments or online, and I'll make sure I've fully explained how to understand and read your report before you do it yourself. There are also helpful tutorial videos on YouTube.<sup>10</sup> Global qualitative patient research suggests that some people with diabetes find the time in range 'traffic light' bar chart and average daily glucose graph straightforward and are using them to guide any changes to their medicine and lifestyle.<sup>10</sup>
- **I don't think I can do this on my own!** We'll always be here to support you. We can talk about your AGP at appointments as you learn to use your CGM device. You can also ask any member of your diabetes care team or your nurse [if available] if you have questions about time in range.

## Real-life example of time in range from an AGP report



## 4. Shall we plan the next step?

### Agree what happens next:

1. **Initiate another appointment**  
or
2. **Refer to another diabetes healthcare professional (e.g. a diabetes nurse)**  
and/or
3. **Signpost the patient to further information**  
(URLs above and below)



## More information about Time in Range:

For you and your HCP staff: [www.TIRHub.com](http://www.TIRHub.com)

For your patients: [www.diabeteswhatsnext.com](http://www.diabeteswhatsnext.com) and [www.diatrIBE.org](http://www.diatrIBE.org)

### References

1. Danne T, Nimri R, Battelino T, *et al.* International Consensus on Use of Continuous Glucose Monitoring, *Diabetes Care* 2017; 40:1631–1640.
2. Battelino T, Danne T, Bergenstal RM, *et al.* Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range. *Diabetes Care*. 2019; 42:1593–1603.
3. Zhou Z, Sun B, Huang C, *et al.* Glycemic variability: adverse clinical outcomes and how to improve it? *Cardiovasc Diabetol* 2020; 19:102.
4. Cheng A, Ginovker A, Christensen T. B, *et al.* Healthcare professionals' knowledge, usage and attitudes towards the use of time in range in diabetes management: an online survey across seven countries. [oral presentation #657] EASD 2022 September 19–23. Available from: <https://sciencehub.novonordisk.com/congresses/easd2022/Cheng.html> [Accessed March 2023]
5. IPG Health. Dr discussion guides for the modern world. (2022). Available at: <https://ipghealth.com/news/doctor-discussion-guides-for-the-modern-world>. [Accessed March 2023]
6. American Diabetes Association Standards of Medical Care in Diabetes 2023. *Diabetes Care*. 2023; 46 (Supplement 1): S1–S292.
7. Thomas MG, Avari P, Godsland IF, *et al.* Optimizing type 1 diabetes after multiple daily injections and capillary blood monitoring: Pump or sensor first? A meta-analysis using pooled differences in outcome measures. *Diabetes Obes Metab*. 2021; 23(11): 2521-2528.
8. Vigersky RA, McMahon C. The Relationship of Hemoglobin A1C to Time-in-Range in Patients with Diabetes. *Diabetes Technol Ther* 2019; 21(2): 81–85.
9. Beck RW, Bergenstal RM, Cheng P, *et al.* The Relationships Between Time in Range, Hyperglycemia Metrics, and HbA1c. *J Diabetes Sci Technol*. 2019; 13(4): 614-626.
10. Novo Nordisk data on file: Harris Poll 2022. TIR Patient Qualitative Research Global Summary Report.
11. International Diabetes Centre. The Ambulatory Glucose Report. Available at: <http://www.agpreport.org/>. [Accessed March 2023]
12. Lu J, Ma X, Zhou J, *et al.* Association of Time in Range, as Assessed by Continuous Glucose Monitoring, With Diabetic Retinopathy in Type 2 Diabetes. *Diabetes Care*. 2018; 41(11):2370-2376.
13. Mayeda L, Katz R, Ahmad I, *et al.* Glucose Time in Range and peripheral neuropathy in type 2 diabetes mellitus and chronic kidney disease. *BMJ Open Diabetes Research and Care*. 2020; 8(1):e000991.
14. Lu J, Ma X, Shen Y, *et al.* Time in Range Is Associated with Carotid Intima-Media Thickness in Type 2 Diabetes. *Diabetes Technol Ther*. 2020; 22(2):72-78.
15. Ranjan AG, Rosenlund SV, Hansen TW, *et al.* Improved Time in Range Over 1 Year Is Associated with Reduced Albuminuria in Individuals With Sensor-Augmented Insulin Pump-Treated Type 1 Diabetes. *Diabetes Care*. 2020; 43(11):2882-2885.
16. Lu J, Wang C, Shen Y, *et al.* Time in Range in Relation to All-Cause and Cardiovascular Mortality in Patients With Type 2 Diabetes: A Prospective Cohort Study. *Diabetes Care*. 2021; 44: 549–555.
17. Mary's experience with Time in Range. Available at: <https://tirhub.com/stories/patient-stories/>. [Accessed March 2023]
18. Lasse's experience with Time in Range. Available at: <https://tirhub.com/stories/patient-stories/>. [Accessed March 2023]
19. Runge AS, Kennedy L, Brown AS, *et al.* Does Time-in-Range Matter? Perspectives From People With Diabetes on the Success of Current Therapies and the Drivers of Improved Outcomes. *Clin Diabetes*. 2018; 36: 1123–1119.
20. Gavin JR, Bailey CJ. Real-world studies Support Use of Continuous Glucose Monitoring in Type 1 and Type 2 Diabetes Independently of Treatment Regimen. *Diab Technol Ther*. 2021; 23(3): S19–S27.
21. National Institute of Diabetes and Digestive and Kidney Diseases. Continuous Glucose Monitoring. Available at: <https://www.niddk.nih.gov/healthinformation/diabetes/overview/managing-diabetes/continuous-glucose-monitoring>. [Accessed March 2023]
22. Quest Health Solutions. 2021. Continuous Glucose Monitors – Uncovering the Myths. Available at: <https://questhealthsolutions.com/blog/continuousglucose-monitors/continuous-glucose-monitors-uncovering-the-myths>. [Accessed March 2023]