

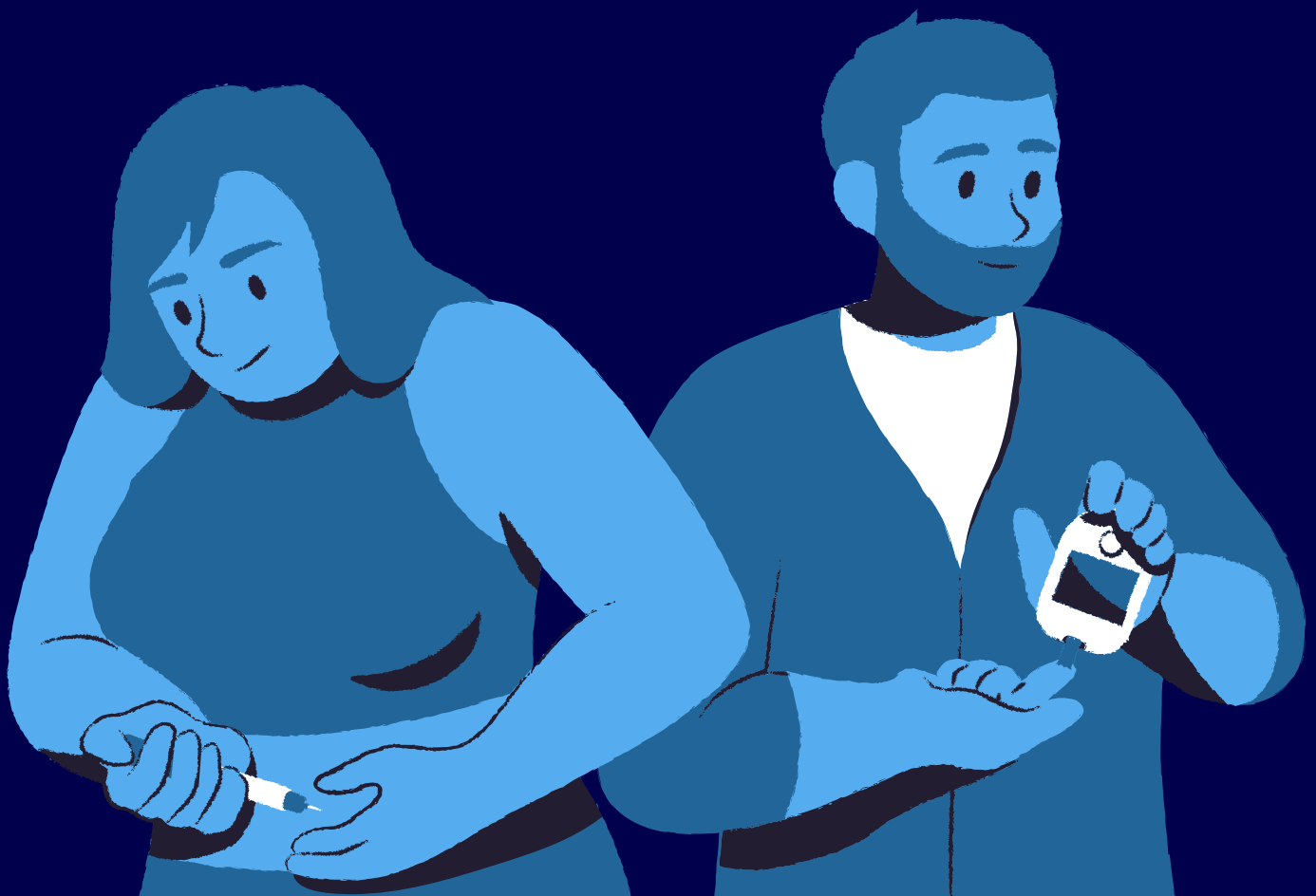


A European project innovating
advanced cell-therapy for
Diabetes



International
Diabetes
Federation
Europe

Daily Life with Type 1 Diabetes: Key Moments and Decisions



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DAILY LIFE WITH TYPE 1 DIABETES

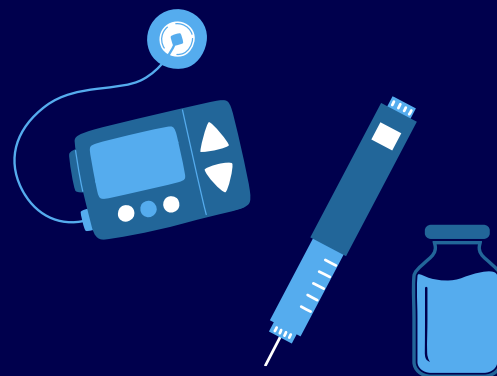
Type 1 diabetes (T1D) is when the body's immune system mistakenly attacks the insulin-producing cells in the pancreas, leaving the body unable to make insulin – a vital hormone that helps move sugar (glucose) from the blood into the body's cells for energy. Without insulin, blood glucose levels rise dangerously high, leading to serious health problems.

People with T1D need to take insulin through multiple daily injections (MDI) or pumps to regulate their blood glucose levels and stay healthy.

MDI is a management method where people take both long-acting insulin to provide a steady baseline level of insulin through the day and night (basal insulin) and rapid-acting insulin to manage blood glucose spikes generally from meals or snacks (bolus insulin).

An insulin pump is a small device that delivers insulin (rapid acting) through a thin, flexible tube called a cannula, which is placed just under the skin, usually on the stomach or upper arm. Cannula changes, which typically occur every 2–3 days, are necessary to prevent infection, ensure proper insulin absorption and avoid tissue damage at the cannula's site.

Living with T1D involves balancing blood glucose, insulin, food, exercise, work, travel, school, relationships, stress and much more every hour. Here's how each part of the day might look for someone managing T1D.



MIDNIGHT TO MORNING



NIGHT

- **12:00–3:00 am** At night, insulin sensitivity (this is how well your body uses insulin to help move glucose from your blood into your cells for energy) often increases due to decreased activity levels, so people living with T1D may need less insulin during this time.
- **12:00–8:00 am** Low blood glucose during sleep can lead to "rebound highs" in the morning. When blood glucose drops, the body triggers a stress response that releases hormones, temporarily reducing insulin sensitivity and leading to elevated morning blood glucose. However, for some, this "rebound high" does not occur, or the low blood glucose is not treated, resulting in the person remaining in a persistent low or hypoglycaemia which can be dangerous and lead to symptoms like confusion, seizures, or even unconsciousness.
- **3:00–10:00 am** For many, the Dawn Phenomenon kicks in. As the body prepares to wake up, hormones like cortisol increase insulin resistance, requiring more insulin to keep blood glucose steady in the morning.

NOTE: low blood glucose overnight leads to reduced quality of sleep, waking up feeling weak, dizzy or fatigued. This can have an impact on a person's ability to go about their "normal" day.





MORNING

- **8:00 am** For people on MDI, basal insulin helps mimic a healthy pancreas, releasing insulin consistently to regulate blood glucose.
- **8:00-10:00 am** Fast-acting insulin covers breakfast, similarly to a healthy pancreas that releases insulin to cover carbs, proteins, and fats. Different rapid acting insulins have different peak times. There's more to it than just timing insulin; considerations include insulin sensitivity, food composition and activity level.

NOTE: this process is not as simple as eat food, take insulin and blood glucose will fall into range. There is a spectrum of additional decisions to take into account – *how “sensitive” am I to my insulin? What is the carbohydrate-to-fat ratio of the food I am eating (because it affects blood glucose levels)? Do I pre-bolus (take insulin before I eat) or as I am eating? Am I going for a run after breakfast, how do I adjust my insulin?* These considerations run throughout the day as we snack, eat lunch and dinner, go out with friends, eat before exercise, etc.



MIDDAY (12:00-6:00 PM)

- This is generally the most active part of the day. Each person's insulin needs vary, so adjusting, based on exercise, work or school routines, is key.
- Stress and lack of sleep can complicate blood glucose control and more static routines, like office jobs sitting at computers, can further have an impact on levels. Small actions like regular movement and mindful eating help refine blood glucose management.

NOTE: insulin sensitivity will play a role here – no two people with diabetes are the same. Thus, their sensitivity and resistance to insulin vary across the day. For some people, this part of the day can be quite challenging to manage low blood glucose (increased sensitivity) or high blood glucose (increased resistance) due to their insulin needs and trends.



EVENING TO NIGHT (6:00 PM-MIDNIGHT)

- **6:00-10:00 pm** Physical activity may play a larger role here. Exercise impacts blood glucose and may require adjusting insulin to avoid post-exercise lows. Thoughtful meal planning and insulin tweaks help keep levels stable through workouts and the night (noting that the same is true no matter the time of the exercise).
- **8:00-12:00 am** For those taking basal insulin at night, this injection sets the stage for steady blood glucose while sleeping. Insulin pump users might change site to ensure smooth insulin delivery.

NOTE: physical exercise can be an area that people living with T1D avoid – *how do I plan to prevent low blood glucose, when and what should I eat beforehand? Do I wear my insulin pump or not?* Physical exercise affects blood glucose levels for the majority of people living with T1D. Some considerations need to be taken about reducing insulin throughout the day (if you are on multiple daily injections) or reducing your basal rates (if you are on insulin pumps) to help you maintain an even blood glucose level throughout exercise. However, we all get this wrong sometimes – our blood glucose will go low or high. What matters is that we know what to do in those cases.

