



TOP TIPS: USING DEXCOM G6 REAL-TIME CGM IN PREGNANCY

WELCOME

i This leaflet has been written to complement the information you will get during your sensor training. The Dexcom G6 sensor is approved for insulin dosing decisions and doesn't require fingerstick calibrations.

ABOUT THE SENSOR

Your sensor sits just under the skin and measures the glucose in the fluid around the cells every minute. The sensor glucose measurement may be 5-10 minutes behind what the blood glucose is reading.

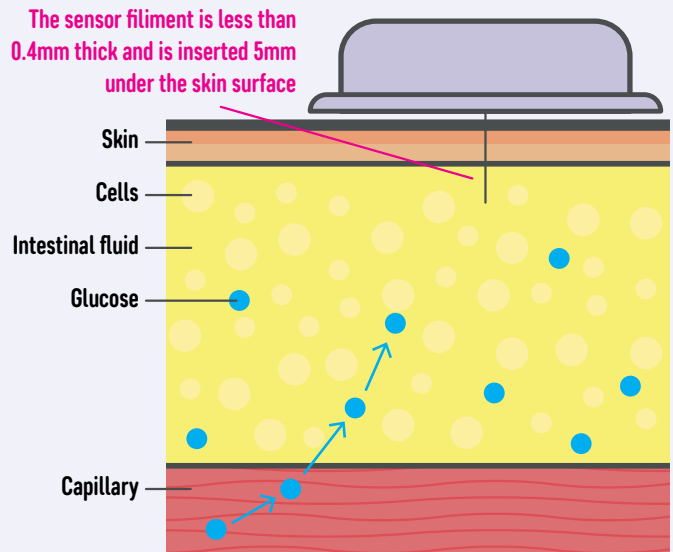
The sensor glucose can be displayed in three ways:

1. Glucose reading now
2. Glucose direction which can be:



3. Glucose history (previous 1, 3, 6, 12 or 24 hours)

The sensor sends glucose data to your mobile phone (and sometimes a smart watch) using the Dexcom Clarity App. If your phone is not compatible with the G6 App we can provide you with a receiver.

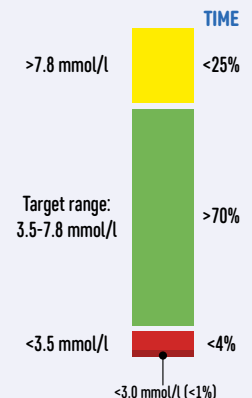


REVIEWING SENSOR GLUCOSE LEVELS

TIME IN RANGE gives a good overall picture of your sensor glucose levels over a 1-2 week time period. Most women start pregnancy with around 50% Time in Range, aiming to get to 70% as soon as possible. It may take until 20-24 weeks of pregnancy, and a **lot of attention to carbohydrate choices and timing of pre-meal insulin doses** to achieve your glucose targets.

- More than 70% (16hrs 48mins/day) Time in Range 3.5-7.8 mmol/L
- Less than 25% (6hrs/day) above 7.8 mmol/L
- Less than 4% (1hr/day) below 3.5mmol/L
- Less than 1% (15 mins/day) below 3.0 mmols/L

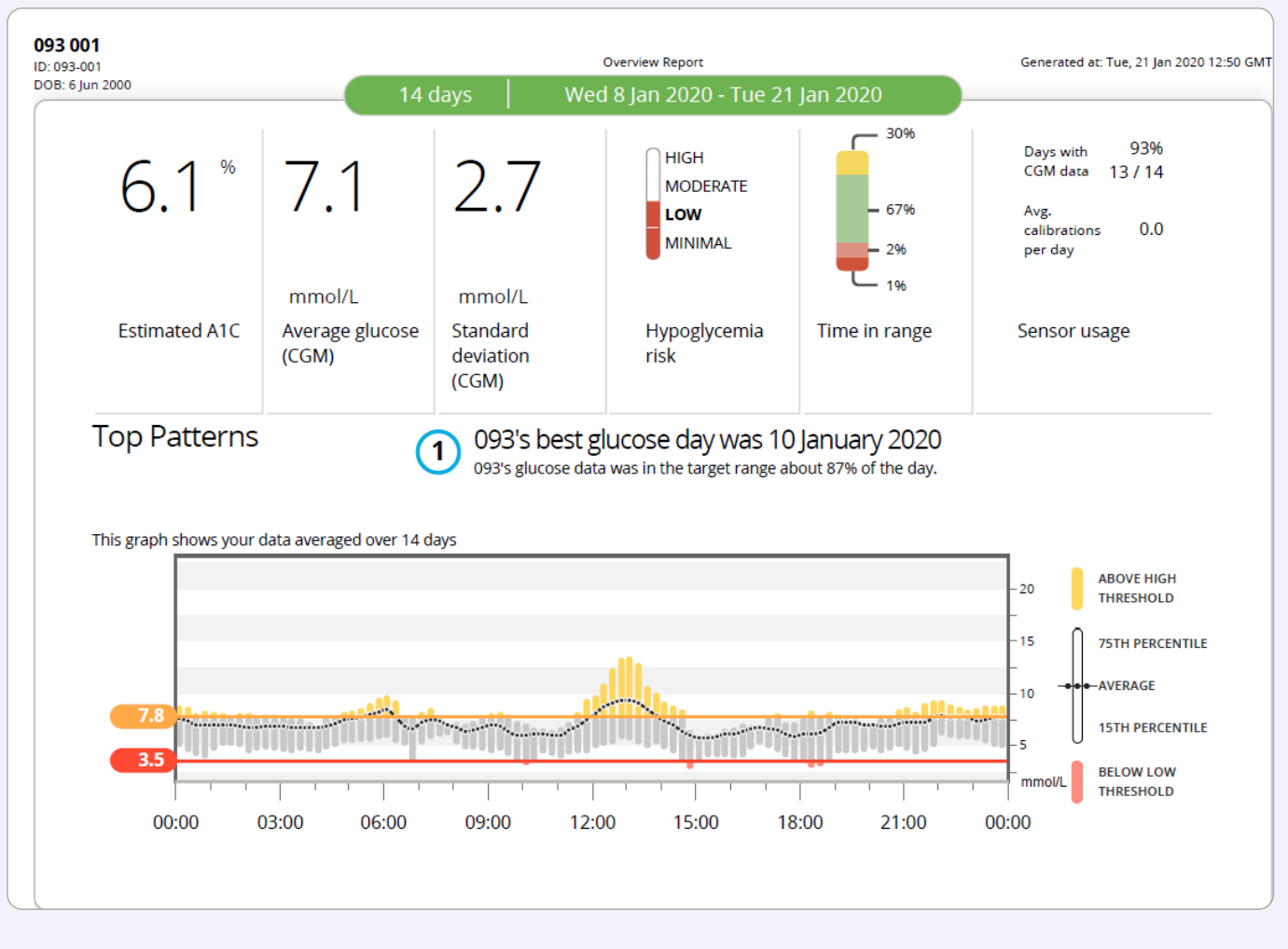
i Every extra 5% Time in Range has benefits for you and your baby!



Adapted from Battelino et al 2019

CONSIDERATIONS WHEN STARTING GLUCOSE SENSORS IN PREGNANCY:

- Be prepared to see many more glucose readings out of target!
- It is important **not to overreact** to readings which are above target with aggressive **correction doses** of insulin. Remember insulin takes time (typically 3-4 hours) to lower above target glucose levels so **don't correct in the first 2 hours after eating!**
- When your glucose levels are above target, reflect on what might have caused the increase?
 - under-estimating or eating **too much carbohydrates** (very easy to do with rice, pasta and potato meals),
 - quickly absorbed carbohydrate choices (e.g. most breakfast cereals, shop bought sandwiches, white flour products),
 - not injecting your pre-meal insulin bolus early enough before eating (aim for at **15±5 mins before eating in trimester 1, 30 ±10 mins in trimester 2 and 45±15 mins in trimester 3**)
- Steady or gentle changes in glucose indicate that your carbohydrate choices and timing of insulin bolus doses are working well
- Some women choose to set a high alert for 10mmol/L or 12mmol/L – entirely optional
- The **Urgent Low Alarm** is set at **3.1mmol/L** and cannot be turned off. **This is for your safety!**
- Sharing your sensor data means that that you and your diabetes team can review your glucose patterns at every clinic appointment. The data shared does not include your name/personal details



WHEN TO DO FINGER STICK CHECKS:

- To confirm hypoglycaemia and monitor recovery from a hypo
- If the sensor reading doesn't match how you feel or the glucose you were expecting
- If the sensor is not working







There are times when the sensor glucose data may be less reliable and you might want to do some finger stick checks, for example during

- the first 24 hours of new sensor
- times of rapidly changing glucose levels (following recovery from a hypo)
- moderate exercise or activity

AVOIDING HYPOGLYCAEMIA

In pregnancy, you may find your symptoms of hypoglycaemia become more subtle and sometimes disappear. Being able to check your glucoses more frequently and using the directional arrows on your sensor can be helpful. The **Urgent Low Alarm** is set at **3.1mmol/L**. This cannot be turned off.

Established sensor users sometimes set an Urgent Low Soon Alert: this alerts 20 min before sensor glucose predicted to reach 3.1 mmol/l, giving more time for hypo prevention. Others prefer to set a higher personalised Low Glucose Threshold Alert between 3.5-4.5 mmol/L. These alerts are optional but early treatment with 5-10g of carbohydrate (sometimes called "micro-carbs") can raise glucose by 1-2 mmols/L and may help you to prevent a hypo event.

Directional Arrows	Over past 15 minutes your glucose has been	If this trend continues how will glucose change?		Hypoglycaemia avoidance and treatment suggestions	
		How long to change by 1 mmol/l?	In 30 minutes		
	Slowly falling	10 mins	2-3 mmol/L		1 GlucoTab or 1 jelly baby = 4g carb
	Falling	5-7 mins	3-5 mmol/L		2 GlucoTabs or 2 jelly babies = 8g carb
	QUICKLY FALLING	Less than 5 mins	Up to 5mmol/L ACT NOW!		3-4 GlucoTabs or 3-4 Jelly babies = 15g carb*

- Remember your **sensor glucose may be 5-10 minutes** behind your blood glucose level and can remain low even when your blood glucose is back in range. Using sensor glucose to monitor recovery from hypoglycaemia may result in over treatment of hypoglycaemia.
- **200mls of orange juice or 1 Lift (Formerly GlucoJuice) drink** contain 15g carb raise glucose levels quickly and **work well for hypo treatment.**
- Always use a finger stick glucose to confirm hypoglycaemia and monitor recovery from a hypo
- During pregnancy, most hypos occur between meals (1-4 hours after eating). These are caused by a mismatch between **quickly absorbed carbohydrates** and **slowly absorbed pre-meal insulin.**
- Frequent between meal hypos indicate that your carbohydrate choices and timing of insulin doses may not be working so well. Ask your diabetes team for advice!

CORRECTING:

Post meal: It is not recommended to correct glucose readings above target within 2 hours of eating as this can result in a low glucose later.

At 1 hour: If your glucose is reading above target and or with upward trending arrows reflect on what might have caused this and can it be avoided in the future? Think about the type of carbohydrate, amount of carbohydrate, insulin timing and your activity levels. 10-15 minutes of post-meal activity (walking, housework etc) will speed up insulin absorption and lower your glucose levels

At 2 hours: If sensor glucose is the same or higher AND is either stable (●no arrows) or rising (●upward arrow) then it is reasonable to give a correction dose. Pump users should use the bolus advisor (which takes account of the insulin on board). If using injected insulin, ask for a bolus calculator device (e.g Expert meter) to calculate your correction dose. Alternatively, you can give half of your usual correction dose,

Do not correct if sensor glucose is falling (●any downward arrow).

ⓘ If you are unwell, have glucose levels above 12mmol/L or have ketones then follow your Sick Day Rules.

TROUBLESHOOTING

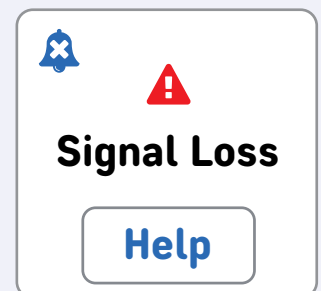
- **Keep the sensor packet** until the sensor has been used effectively and removed. If the sensor ends early or falls off make a note on the packet and bring the lid with the lot number to your next clinic appointment
- If the sensor does not deploy properly and the needle doesn't retract then bring the whole device back in the packet and your study team will provide replacements

SENSOR SIGNAL LOSS

Sensor signal can occasionally drop out and should automatically reconnect. If it doesn't try

- Turning your Bluetooth off and on again. Turning your phone off and on again can also help.
- If still not reconnecting make a note of the transmitter ID. Enter a fake ID starting with 8 (for example 8YYYYY) and allow the system to search for it. Then re-enter the correct transmitter ID and it should automatically reconnect.
- If you have persistent signal loss contact the study team

ⓘ Always keep a finger stick meter with you. Don't rely 100% on the sensor glucose levels



SKIN CARE

The sensor should stay securely attached to your skin using its own adhesive. Some women find adhesive barrier wipes (Skin Tac™) helpful to improve skin "stickiness", others use overlay patches or medical tape around the edges of the adhesive patch (making sure not to cover the transmitter). Medical adhesive removers (Lift Plus) can help to remove residual adhesive. Your study team can supply these for you to try.

LABOUR & DELIVERY

More and more women continue sensor use during antenatal hospital admissions, after steroids and throughout labour and delivery. Midwives may not always be familiar with sensors and may take additional glucose measurements on hospital meters for their records. Your research team will provide written guidance for obstetric teams so that you can be supported to continue sensor use in hospital

EATING THE RIGHT TYPE OF CARBOHYDRATE



Different carbohydrates can have very different effects on blood glucose levels after eating. Choosing the right type of carbohydrate can make all the difference to keeping the 1 hour post meal glucose below the target of 7.8mmols/l.

Carbohydrates that are unrefined, high in fibre with a low glycaemic index (below 55) create a slower and lower rise in glucose levels after eating.

The table attached lists the foods that most women find don't work well in pregnancy with better alternatives.

ACTION DONE (TICK BOX):

EATING THE RIGHT AMOUNT OF CARBOHYDRATE



It is important to eat enough carbohydrate to provide enough energy and nutrition to support a healthy pregnancy.

However too much carbohydrate makes it impossible to achieve the post meal glucose targets.

Carbohydrate is better tolerated when eaten in smaller quantities so eating small amounts at meals with carbohydrate containing snacks between can be very helpful.

You may find the carbohydrate amounts below a good place to start.

- **Breakfast:** 15-20g carbohydrate
- **Lunch and dinner:** 40-60g carbohydrate
- **Mid-meal snacks:** 10-15g carbohydrate

ACTION DONE (TICK BOX):

TIMING OF BOLUS INSULIN

Giving your bolus insulin ahead of eating can help limit the post meal rise in glucose levels

In early pregnancy giving insulin 10-15 minutes before and as your pregnancy progresses extending this time to 30-40 plus minutes.

ACTION DONE (TICK BOX):



GETTING BREAKFAST RIGHT



Breakfast is the most challenging meal for keeping the post meal glucose in target; carbohydrate is not well tolerated at this time of day. Most women have to spread their breakfast over 2 smaller meals containing 15-20g.

Good breakfast choices:

- 1 slice whole-wheat toast (C15g) with a topping e.g. poached or scrambled eggs / mushrooms / tomato / cheese / ham / bacon / avocado.
- 1 small pot yoghurt (C13g) with one small chopped fruit or cup of berries (C7g) topped with nuts / seeds
- 25g jumbo porridge oats (C15g) soaked overnight in crème fraiche and 1 cup berries (C7g), top with nuts / seeds
- 40g jumbo porridge oats (C25g) cooked with water and single cream added to taste

ACTION DONE (TICK BOX):

BULKING UP MEALS WITH MORE PROTEIN AND VEGETABLES / SALAD



Eating more protein foods such as meat, fish, chicken, cheese, eggs, tofu, Quorn, pulses and vegetables will fill you up more and stop you feeling hungry. These foods also flatten out the post meal glucose rise and so help achieve the post meal glucose targets whilst avoiding dips in glucoses later.

ACTION DONE (TICK BOX):

BEING ACTIVE AFTER EATING



Being active for 10-15 minutes after eating can make your post meal glucose level as much as 2 mmols/L lower and so help achieve the post meal glucose target.

This can be going for a walk or being active around the house or work place.

AVOID BEING INACTIVE IMMEDIATELY AFTER EATING

ACTION DONE (TICK BOX):

AVOID EATING CARBOHYDRATE LATE IN EVENING

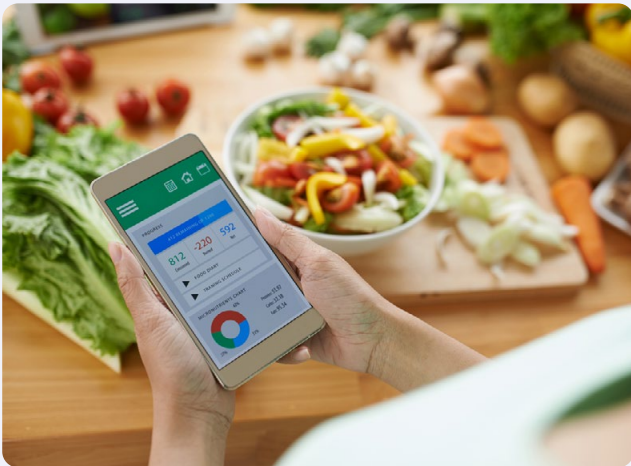


Overnight can be as much as a third of your day so getting glucose levels as near normal pre bed and overnight can really help optimise glucose levels for pregnancy.

Eating your evening meal before 7.30 pm and keeping evening snacks to minimal carbohydrate or carbohydrate free (unless eaten to avoid a hypo) can make all the difference to achieving the pre-bed, overnight and even fasting glucose targets.

ACTION DONE (TICK BOX):

ACCURATE CARBOHYDRATE COUNTING



There are a number of useful resources to help with accurate carbohydrate counting:

- Carbs & Cals book or app (Chris Cheyette & Yello Balolia, Publisher - Chello)
- DAFNE Carbohydrate Portion List
- MyFitnessPal App
- Food Labels: use the “total carbohydrate” amount when working out how much carbohydrate is in the food.
- Restaurant’s web sites: Nutritional information

ACTION DONE (TICK BOX):

KEEP A FOOD DIARY



Keeping a food diary can help you learn what meals and carbohydrate choices are working well for you keeping those post meal glucoses in target. It can also help you see which choices are best avoided.

ACTION DONE (TICK BOX):

STAY IN TOUCH



It can be challenging to keep up with changes in insulin requirements as your pregnancy progresses

Women who are in regular contact with the diabetes educators report better glucose levels and feel in better control.

ACTION DONE (TICK BOX):

SNACKS



Snacking mid meal can be really helpful to avoid post meal hypos, help manage hunger and optimise nutrition.

Making snack choice healthy, high in fibre and avoiding refined forms of carbohydrate really helps keep glucose levels stable between meals.

Good types of carbohydrate snacks are: fruit, yogurt, whole wheat crackers & oatcakes with protein toppings. Additional lists are available from clinic.

It can feel tempting to go for sweeter more refined carbohydrates especially if trying to avoid a hypo but these foods, even if covered with insulin, make it difficult to keep the next pre meal glucose in target.

ACTION DONE (TICK BOX):

CARBOHYDRATE CHOICES

This table lists foods that many pregnant women with diabetes have found result in glucose levels above target post-meal. The 'try instead' list suggests some alternatives that can work well.

✘ REFINED CARBOHYDRATES TO AVOID (High glycaemic index (GI))	✔ TRY INSTEAD (Low glycaemic index (GI))
<p>All white breads: loaf, rolls, pitta, naan, non-traditional baguette, croissant, chapattis, Panini, wraps.</p>	<p>High fibre breads: Rye bread and sourdough bread have the lowest GI. Whole-wheat, stoneground, granary and multi-grain varieties of breads have lower GIs. Chapattis made with whole meal flour Freezing bread first can help lower the GI</p>
<p>White flour based foods: Cakes, biscuits, cream crackers, water biscuits, Ritz, Tuc, Yorkshire pudding, dumplings, pizza, pastry (pies, pasties, quiche, sausage rolls, spring rolls). Breaded & battered foods e.g. fish fingers, battered fish</p>	<p>Oatcakes Whole-wheat crackers & crisp-bread e.g. Ryvita, Cracker wheat. Wheatmeal Digestives, Hobnobs, Hovis biscuits (one or two)</p>
<p>Low fibre & sugar coated breakfast cereals: Cornflakes, Rice Krispies, Special K, Sugar Puffs, Cocoa Pops, sweetened muesli.</p>	<p>High fibre cereals: Jumbo oats Most women don't tolerate any cereal in pregnancy. You may tolerate small amounts of some high fibre cereals earlier in pregnancy (up to 20 weeks): All Bran, Bran Buds, Shredded Wheat See breakfast guidance</p>
<p>Rice, pasta, grains: No types need to be avoided.</p>	<p>The best rice is basmati. Brown rice & whole-wheat pasta may give benefit. Cooling rice, pasta and potato after cooking and then eating cold or re-heating will lower the GI Couscous, bulgur wheat, semolina, tapioca, quinoa</p>
<p>Processed potato products: Oven chips, French Fries, Smiley faces, waffles, Croquettes, frozen roast potatoes, instant potato, ready meals with instant potato topping</p>	<p>Home cooked potatoes: Boiled is best Lightly mashed (non-instant) Small baked potato, Sweet potato, yam, cassava</p>
<p>Processed savoury snacks: Hula Hoops, Quavers, Pringles, Monster Munch, French Fries, Skips, baked crisps</p>	<p>Sliced potato crisps (e.g. Walker's or Kettle crisps) Ryvita snacks Vegetable crisps Salted or natural popcorn</p>
<p>Cold drinks: Fruit juices, smoothies, full sugar squash and fizzy drinks Lucozade</p>	<p>Water. Sugar free squash, sugar free carbonated drinks. DASH water. Soda water.</p>
<p>Sugar: Sugar, glucose, maltose, dextrose, honey, treacle and syrup</p>	<p>Artificial sweeteners if a variety are used and in small quantities Splenda, Sweetex, Hermesetas, Nutrasweet, Candarel, Stevia</p>
<p>Preserves/spreads: Jam, marmalade, honey, lemon curd, maple syrup, chocolate spread</p>	<p>Marmite, Vegemite, nut butters such as peanut butter</p>

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✘ REFINED CARBOHYDRATES TO AVOID (High glycaemic index (GI))	✔ TRY INSTEAD (Low glycaemic index (GI))
<p>Sweets / desserts: Melon, mango, pineapple (some people may tolerate small portions), Dried fruit Sweets, chocolates, mints Sweet puddings Tinned fruit in syrup</p>	<p>Fresh fruit, frozen fruit, tinned fruit in natural juice (juice drained off) Sugar free Jelly Yogurt: natural, Greek-style, Icelandic style (high protein such as Skyr), fruit yogurt (under 15g total carbohydrate per portion or pot) 70% cocoa solids chocolate Full fat ice cream (no added biscuits/caramel ripple/etc.)</p>
<p>Condensed, evaporated milk</p>	<p>Crème Fraiche, cream</p>
<p>Ready meals/stir in sauces/take away: Some ready meals & sauces contain significant amounts of sugar for example sweet & sour sauces, jar or packet Chinese sauces, Chinese takeaway, tomato soup, baked beans, tinned spaghetti</p>	<p>Reduced sugar baked beans (drain off as much sauce as possible)</p>
<p>Bed-time & Malted drinks such as Ovaltine, Horlicks, drinking chocolate.</p>	<p>Cadbury's Highlight, Ovaltine Options, cocoa powder.</p>

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