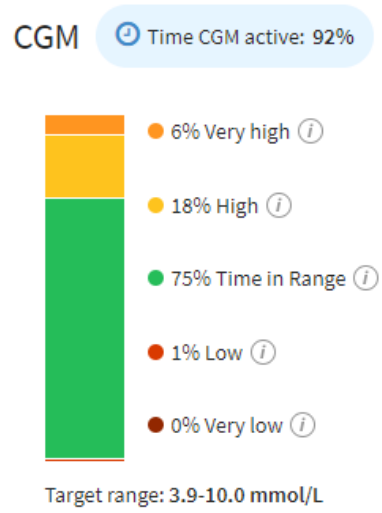
CamAPS Auto mode

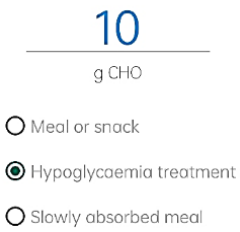
HYPOGLYCAEMIA MANAGEMENT

One of the main aims of auto mode is to improve time in range (TIR) without increasing risk of hypoglycaemia.



Time in Ranges	mmol/L	Goal
Time Above	13.9	<5%
Time Above	10.0	<25%
Time in Range	3.9 - 10	>70%
Time Below	3.9	<4%
Time Below	3.0	<1%

The CamAPS app pairs with the Ypsomed pump and Dexcom G6 to deliver automated insulin. When auto mode is turned on, insulin delivery is adjusted according to the sensor glucose levels. However, hypoglycaemia can still occur. Treat using half the fast-acting glucose you would normally use. You will also need to enter hypo treatment into the add meal function.



Age	Treatment in Manual mode	Treatment in Auto mode
≤ 5 years	5g fast acting carb	2.5g fast acting carb
6 – 12 years	10g fast acting carb	5g fast acting carb
>12 years	15g fast acting carb	7.5g fast acting carb

1. If the sensor glucose level remains below 3.9 mmol/L after 20 mins, **repeat** step 1.
2. If the sensor glucose is 3.9 mmol/L or above, no further action is required. The insulin pump will resume basal delivery once it detects your sensor glucose levels rising again.

Remember, it is also recommended to check blood glucose levels with a finger prick if a person's symptoms do not match the sensor readings.

If you have any further queries, please do not hesitate to contact our team on **64561111** or **pchdiabetestriage@health.wa.gov.au**

HYPERGLYCAEMIA (HIGH BGL) MANAGEMENT

Possible causes
1. Missed meal bolus- Auto Basal is not intended to manage significant highs, which can occur from missed meal boluses or highly underestimated carb intake.
2. Meal Bolus given too close to the meal
3. Flow of insulin interrupted: blockage or kink in the infusion set cannula bent or dislodged set not connected properly air bubble in the infusion set pump is disconnected/ suspended for too long
4. Site not absorbing i.e., due for a line change
5. Site infection
6. Illness
7. Stress
8. Decreased activity

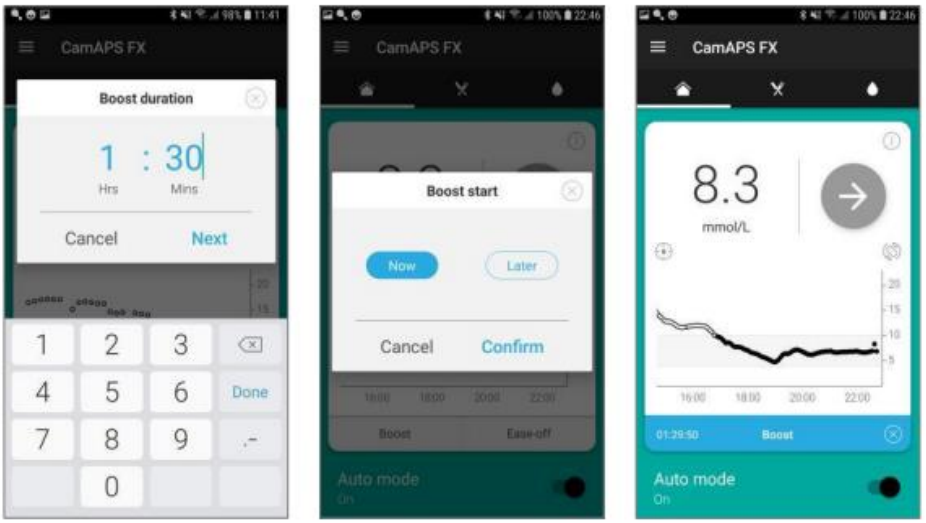
Problem Solving

- Bolus for all meals and double check carb counting
- Bolus for meals 15 minutes before eating to match insulin dose with carbs eaten

Boost

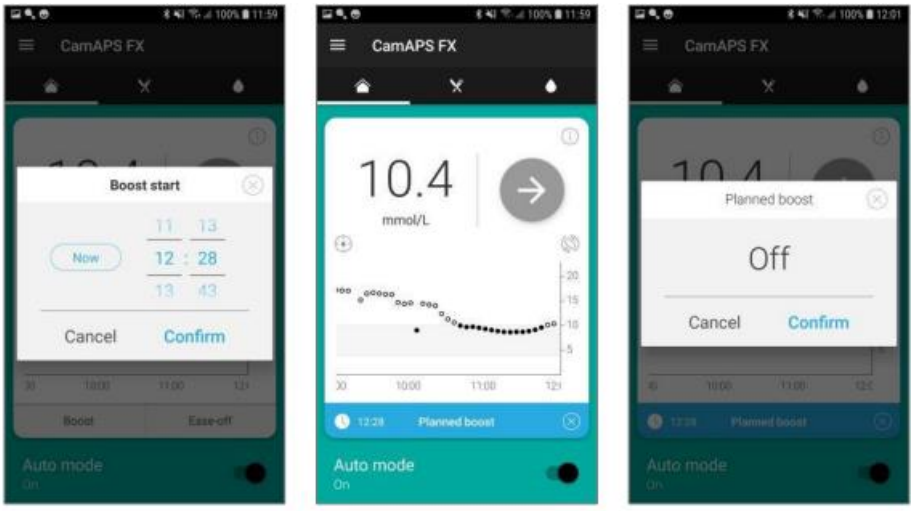
‘**Boost**’ is a mode of operation that can be used when more insulin is needed. This could be at times of inactivity, increased food intake or during illness or stress. You will be able to set up the duration (from 0 to 13 hours) and the time you want the Boost mode to start.
To start ‘Boost’:

- Tap on the ‘Boost’ tab located on the home screen
- Help screen appears; read and dismiss
- ‘Boost duration’ window appears; tap in the Hrs/Mins entry fields to enter duration



- Should you wish ‘Boost’ to start at a later time, select the desired duration as before and tap ‘Next’; then in the ‘Boost start’ window select ‘Later’

- Clock dial appears; select time to start ‘Boost’ then tap ‘Confirm



- Planned Boost’ status tab appears below the graph showing that the Boost mode is due to start at a set time; note the clock symbol and the time on the left of the tab indicating the planned time of ‘Boost’

KETONES

Check ketones if BGL > 15 mmol/L.

If positive for ketones, ≥ 0.6 mmol/L - More insulin is required.

Turn off Auto mode

Using a pen or syringe give an extra 50% to 100% of correction bolus (depending on level of ketones) and re-site the cannula.

Consider the use of an increased temporary basal rate once the cannula is re-sited.

Check BGL and ketones every 2 hours.

Return to Auto mode once ketones are negative and BGL stable.

SICK DAY MANAGEMENT

General Points:

NEVER STOP INSULIN COMPLETELY AS THIS MAY LEAD TO KETONE PRODUCTION

- Test blood glucose levels and ketones (regardless of BGL) every 2 hours.

- If unable to give enough corrections to reduce high glucose levels may need to turn off Auto mode and use temporary basal settings from 150%.

Ketones:

- **Turn off Auto mode if ketones are present.**

- Give insulin injection for ketones
  Stay in Manual Mode for 3 hours (duration of action of insulin) before returning to Auto mode

IF BGL CONSISTENTLY GREATER THAN 15 mmol/L	IF BGL 8 - 15mmol/L	IF BGL CONSISTENTLY LESS THAN 4mmol/L
Negative Ketones • Check BG every 2 hours • Give correction doses as recommended by the system	**Positive ketones** **0.6 – 0.9mmols or trace – low on urine test** • Monitor BGL and ketones 2 hourly • Continue in Auto mode and follow prompts • Bolus for sweetened fluids or food	**Negative Ketones** • Turn off Auto mode and use temp rate of 50% • Treat the hypoglycaemia if present and recheck blood glucose level within half an hour
Positive Ketones • Turn off Auto mode • Using a pen give 50 -100% extra correction bolus and resite the cannula. • An increased temporary basal rate and extra corrections may be required every 2 hours until the ketones are <0.6mmols and the **BG** level has reached your target.	**Positive ketones** **>1.0mmol or moderate - large on urine test** • Turn off Auto mode • Using a pen give 50 -100% extra correction bolus and resite the cannula • Bolus for sweetened fluids or food **Phone for advice if necessary**	**Positive ketones** • Turn off Auto mode • Treat the hypoglycaemia if present and recheck blood glucose level within half an hour • When the BGL is above 4mmol give sweetened fluids or food and bolus for these • Monitor BGL and ketones 2 hourly **Phoning for advice is recommended.**

EXERCISE MANAGEMENT

For **Aerobic Exercise** which include sports and activities such as running, swimming**,** dancing, football, netball, basketball, kickboxing or bike riding your child may experience hypoglycaemia.

For **Anaerobic Exercise,** which include sports and activities such as weight training, sprinting or jumping or any exercise that consists of short exertion and high intensity movement, may cause your child to have hyperglycaemia. In this case, it may be necessary to monitor BGL more frequently and give corrections if the system allows.

Response to exercise is very individual. To understand how different exercise and duration or intensity impacts your child's glucose levels when using Auto mode, it is recommended to record strategies and observe the different outcomes.

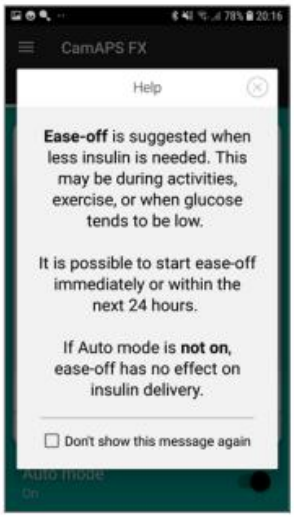
A strategy to prevent hypos using Auto mode is to use the **Ease off function** which reduces the basal insulin delivery.

Ease-off

'Ease-off' can be used when less insulin is needed. This could be during exercise or when glucose tends to be low. You will be able to set up the duration (from 0 to 24 hours) and the time you want the 'Ease-off' to start.
To start 'Ease off':

- Tap on the 'Ease-off' tab on the home screen
- Help screen appears, read then dismiss
- 'Ease-off duration' window appears; tap in the Hrs/Mins entry fields to enter duration







You can use **'Ease off"** for 1-2 hours before exercise, depending on current glucose levels

- Ease off' can continue until 1-2 hours after exercise if glucose levels are trending low
- Your child may need to use the **'Ease off'** overnight for up to 12 hours to prevent post exercise hypoglycaemia

- Consider under bolusing the meal just before sport for younger children

If hypos occur even with use of the **'Ease off'** for spontaneous exercise, consider these actions for your next exercise session:

- Suspend the pump during exercise
- Consider giving a carbohydrate snack **immediately** before exercise if glucose level is < 8.3mmol/L
- If the carbohydrate snack is given more than 10-15minutes before exercise (when the pump is still on) without a bolus, the auto basal will increase to cover rising glucose levels which may cause hypoglycaemia during exercise
- When in auto mode we need to re-think how carbs are given before sport.

For any sport or activity consider how this has been managed previously and adjust based on the impact of auto basal and autocorrections.

REMEMBER: SUSPEND IF DISCONNECTING YOUR PUMP FOR LONGER THAN 15 MINS

Meal management - Food Tips

Meal Boluses:

- Should be given at least 10 - 15 minutes **before** eating to optimise insulin action
- However: if BGL is 4.4 – 5 mmol/L bolus 5 minutes before eating

  If BGL is 4 – 4.3 mmol/L bolus just before eating
- Hypoglycaemia may occur if your child is not bolusing for meals early enough

  -This may occur if the bolus was delivered at the time of the meal or after they have started eating (depending on glucose levels)
  -This is due to the auto basal insulin increasing to match the increasing sensor glucose reading from the meal.
  -When the patient gives the bolus insulin for the meal in addition to the already increased basal insulin there is too much insulin on-board, this can cause hypoglycaemia

Missed or forgotten bolus

- If meal bolus has been forgotten and:
  - Identified within 1 hour of eating enter 50% of carb intake and recheck in 1 hour.
  - Identified more than 1 hour after eating use 'Boost' and continue to monitor hourly until target has been achieved

Delayed or extended glucose rise after a meal:

Meals with higher fat or protein meals (that also have carbohydrates) *may* show a fall in glucose, post bolus, then an extended rise 2-5 hours later.

There are two ways to manage this:

1) Enter the carbs before the meal and allow the Auto Basal to adjust as needed if there is a delayed or extended rise. This is a good option for a one-off meal.

2) Give extra insulin and use the *slowly absorbed meal* feature. This is good option for a regular family meal that results in delayed glucose rises.

   1) Add 20% to the carb dose. i.e., if 40g of carbs add 10g. Total 50g bolus.
   2) Bolus for 60 to 70%
   3) Select *add meal:*
   4) Enter remaining carbs as *slowly absorbed meal*

This method may require some trial and error to see which types of food need an extended bolus and the amount and ratio of insulin. Contact your clinic dietitian on the best way to manage with these types of meals.

Bedtime snacks

It is a good idea to refrain from giving your child a snack at bedtime, without bolusing, to prevent hypoglycaemia overnight. The Auto Basal will reduce to prevent a hypo from occurring if SGLs decrease. It may take a bit of getting used to, but you will gain trust in the system.