Hyperglycaemia & Sick Day Rules: Hybrid Closed Loop

Glucose 14 mmol/L or higher for more than 2 hours, or feeling unwell?

Check blood glucose and ketones

***If you are vomiting and unable to keep fluids down, ketones are more than 3.0mmol/L, and you can't keep glucose in target, there is a high risk of DKA so you must go to hospital as an emergency.**

1: If blood ketones are less than 0.6mmol/L

Stay in automated mode

Auto mode will aim to bring glucose levels down by increasing basal/giving corrections.

Check sensor glucose matches blood glucose.

Give correction bolus **via pump/handset** in addition to insulin required for food.

Recheck blood glucose and ketones in **2 hours**.

- **Glucose <14 mmol/L, Ketones <0.6 mmol/L** → Continue in automated mode on insulin pump.
- **Glucose >14 mmol/L, Ketones <0.6 mmol/L** → Change cannula resevoir and infusion set. New POD for Omnipod users. → **Give correction via pump.**
- **Glucose >14 mmol/L, Ketones 0.6 mmol/L or above.** → Exit automated mode to use pump in manual mode

2: If blood ketones are between 0.6-1.5mmol/L

3: If blood ketones are above 1.5mmol/L*

Exit automated mode to use pump in manual mode

Calculate (look up) average Total Daily Dose (TDD)

See previous day/14 day history on pump/handset or can be found on last clinic letter.

2: Give **10%** of TDD of fast acting insulin as a correction dose via **INSULIN PEN** (not pump).

If TDD unavailable give **0.1 units/kg** of body weight as a correction dose).

Give in addition to insulin required for food.

3: Give **20%** of TDD of fast acting insulin as a correction dose via **INSULIN PEN** (not pump).

If TDD unavailable give **0.2 units/kg** of body weight as a correction dose).

Give in addition to insulin required for food.

Change cannula, reservoir and infusion set. New POD for Omnipod users.

Recheck blood glucose and ketones in 2 hours (following pen correction/bolus via pump)

- **Blood ketones less than 0.6mmol/L**
  - Give usual correction via **the insulin pump**. (Temporary basal rate can be stopped if active)
  - Recheck blood glucose and ketones **2 hourly** until ketones are less than **0.6mmol/L** on 2 consecutive checks and blood glucose is less than **14mmol/L**.
  - Restart automated mode when ketones are less than **0.6mmol/L** and it has been at least 4 hours since pen injection.
  - Continue in automated mode on insulin pump.
- **Blood ketones between 0.6-1.5mmol/L**
  - Give **10%** of TDD as a correction **via the insulin pump**.
  - Give in addition to insulin required for food.
  - Consider increasing temporary basal by **30%.**
- **Blood ketones above 1.5mmol/L***
  - Give **20%** of TDD as a correction **via the insulin pump**.
  - Give in addition to insulin required for food.
  - Consider increasing temporary basal by **50%.**

Continue to cycle through flowchart every **2 hours** (even through the night).

If you have been trying to resolve ketones and hyperglycaemia for more than 4 hours with no improvement please seek help.

Admission is required if:

- **Ketones continue rising above 1.5mmol/L despite above mangement.**
- **Ketones are above 3mmol/L with vomiting or glucose above 14mmol/L. DKA risk is high.**
- **Vomiting or can't keep fluids down.**

If ketones are above 0.6mmol/L when glucose is between 3.9-5.5mmol/L, these are most likely 'starvation ketones' and usually respond to consuming carbohydrates with insulin.

If fluids are not tolerated, admission may be required.

The following 'Sick Day Rules' should be followed alongside the flowchart:

Insulin

- Never stop or omit insulin (doses may need to be adjusted depending on glucose and ketone levels).
- Insulin is required to switch off ketone production.
- Give fast acting insulin every 2 hours if blood glucose is above target and/or blood ketones remain above 0.6mmol/L (follow flowchart for doses).

Blood glucose and ketones checking

- Check glucose and ketones more frequently in illness e.g. every 2 hours including through the night.
- Check blood ketones regardless of blood glucose level when unwell.
- Follow sick day rules advice until ketones are below 0.6mmol/L for 2 consecutive checks.

Fluids

- If refusing to eat, sugary fluids can be given with insulin.
- Keep well hydrated by drinking plenty of sugar-free fluids for normal or high glucose levels (e.g. at least 50mls/hr for pre-school, at least 100ml/hr for teens).
- Give insulin for fluid containing carbohydrates, unless blood glucose levels are less than 5.5mmol/L or hypo.

Developed by the CYP National Diabetes Network Technology Group and clinically approved by The Leeds Teaching hospital March 2026. Review Date – September 2027