PUMP FAILURE GUIDELINES

Planning ahead

All technology, including pumps, can fail occasionally, even within their warranty period. It is important to be able to independently initiate injection treatment if required. The aim of this guide is to assist you in this process.

Remember: more than two hours without insulin delivery can lead to diabetic ketoacidosis (DKA).

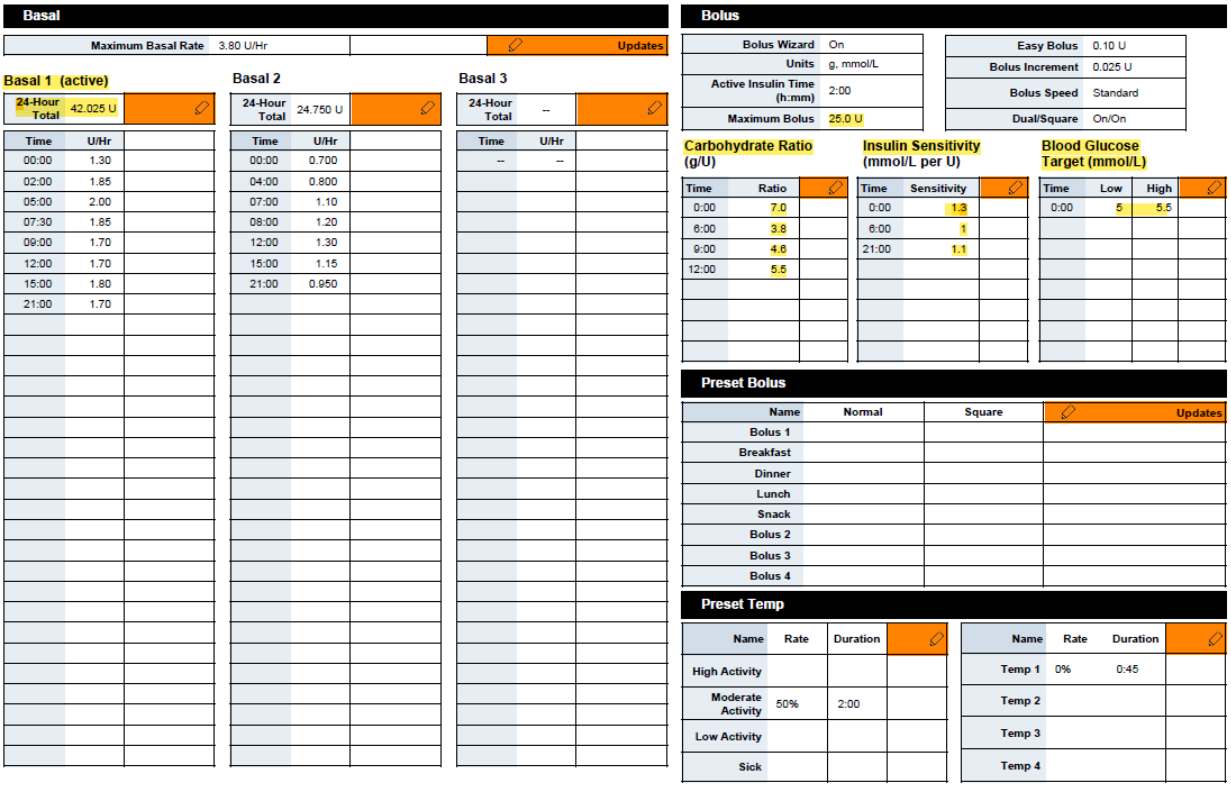
Be prepared

All families on pump therapy should ensure they have:

- Novorapid or Humalog pens with penfill cartridges or disposable pens
- Pen needle tips
- A prescription (in date) for long-acting insulin (i.e. Optisulin)
- A plan of how to calculate doses if you need to revert back to injections

To be able to calculate doses you will need to refer to the pump's programmed settings. The best way to ensure you have your child's latest data is to **upload the pump regularly**. There is one page which gives you all the settings you will need.

Medtronic Carelink settings page (below):



Basal

Maximum Basal Rate	3.80 U/Hr		Updates

Basal 1 (active)

24-Hour Total	42.025 U

Time	U/Hr
00:00	1.30
02:00	1.85
05:00	2.00
07:30	1.85
09:00	1.70
12:00	1.70
15:00	1.80
21:00	1.70

Basal 2

24-Hour Total	24.750 U

Time	U/Hr
00:00	0.700
04:00	0.800
07:00	1.10
08:00	1.20
12:00	1.30
15:00	1.15
21:00	0.950

Basal 3

24-Hour Total	--

Time	U/Hr
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Bolus

Bolus Wizard	On
Units	g, mmol/L
Active Insulin Time (h:mm)	2:00
Maximum Bolus	25.0 U

Easy Bolus	0.10 U
Bolus Increment	0.025 U
Bolus Speed	Standard
Dual/Square	On/On

Carbohydrate Ratio (g/U)

Time	Ratio
0:00	7.0
6:00	3.8
9:00	4.6
12:00	5.5

Insulin Sensitivity (mmol/L per U)

Time	Sensitivity
0:00	1.3
6:00	1
21:00	1.1

Blood Glucose Target (mmol/L)

Time	Low	High
0:00	5	5.5

Preset Bolus

Name	Normal	Square	Updates
Bolus 1			
Breakfast			
Dinner			
Lunch			
Snack			
Bolus 2			
Bolus 3			
Bolus 4			

Preset Temp

Name	Rate	Duration
High Activity		
Moderate Activity	50%	2:00
Low Activity		
Sick		

Name	Rate	Duration
Temp 1	0%	0:45
Temp 2		
Temp 3		
Temp 4		

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Glooko settings/rates page (below):

Insulet Omnipod Dash® System

General		Bolus	
Active Insulin Time	3 hours	Min BG for Bolus Calc	3.9 mmol/L
Unit of Measurement	mmol/L	Bolus Calculator Enabled	ON
BG Goal High	10 mmol/L	Extended Bolus	ON
BG Goal Low	3.9 mmol/L	Reverse Correction	ON
Low Reservoir Level	10 U	Max Bolus	18 U
Pod Expiration	2 hours	Bolus Reminder Options enable	OFF
BG reminder	OFF		
Auto-off alarm	OFF		
Reminder alerts	ON		
Confidence alerts	ON		
BG sound	ON		
Bolus increment	0.05 U		
Language	English		
Basal			
Max Basal Rate	1 U/hour		
Temporary Basal Method	%		
Temporary Basal Enabled	ON		
Active basal program	Normal School Day		

Settings will be required to be able to calculate injection doses, and to enter into a bolus calculator (MyLife app) or replacement pump if needed.

It is worth spending the time on the phone to the pump company's helpline to enable uploading of the pump.

**The highlighted settings indicate the ICR, ISF, active insulin and glucose target you can use for injection doses if the pump fails.*

You will need to know:

1. Current insulin to Carbohydrate Ratio (ICR) – there may be multiple at different times of the day
2. Current Insulin Sensitivity Factor (ISF)/Correction Factor – there may be multiple at different times of the day
3. 24-hour basal total dose

What if you haven't done a recent pump upload?

Use the pump history and record the Total Daily Dose (TDD) for the past 5 days.
Add the 5 days together and divide by 5 to get an average TDD.

Insulin to Carbohydrate Ratio (ICR)

Under 5yrs

To get a general idea of what the ICR should be, use the **300 RULE**:

- Divide **300** by the average amount of insulin given over the last 5 days (average TDD)
- This gives you the carbohydrate part of the ratio
- For example, if the average daily dose of insulin over the last 5 days is 15 units, the calculation is 300 /15 = 20 and the ICR is 1:20.

≥ 5 years

To get a general idea of what the ICR should be, use the **500 RULE**:

- Divide **500** by the average amount of insulin given over the last 5 days
- This gives you the carbohydrate part of the ratio

For example:

If the average daily dose of insulin over the last 5 days is 50 units: Calculation is therefore

500 divided by 50 units, the calculation is 500 / 50
= ICR of 10.

Insulin Sensitivity Factor (ISF)/Correction Factor

To get a general idea of what the ISF should be, use the **100 RULE**:

- Divide **100** by the average daily amount of insulin given over the last five days
- For example, if the average daily dose of insulin over the last five days is 20 units, the calculation is 100/20 = 5 (1 unit lowers the blood glucose level by 5 mmol/L).

The total basal dose on the pump will give you a good guide of how much Optisulin your child will require. If you are not sure what the total basal dose is, give 40% of the average TDD. **Use this method if you are using the Ypso/CamAPS in automode.**

PUMP FAILURE CHECKLIST & PLAN

Checklist:

- ☐ Novorapid or Humalog penfill cartridges
- ☐ Pen needle tips
- ☐ Intermediate or long-acting insulin or an in-date prescription (e.g. Levemir, Optisulin)

Action if your pump fails:

1. Test BGL
2. Test ketones if BGL > 15 mmol/L
3. Give insulin if needed
4. Give long-acting insulin via injection – either total basal daily dose, or if not sure what this is, give 40% of total daily dose
5. Give short-acting insulin via injection before meals
6. Call the pump company helpline or representative:

   Medtronic: 1800 777 808 (24 hour global helpline)
   AMSL: 1300 851 056 (24 hour global helpline)
   Ypsomed: 1800 447 042
   Insulet: 1800 954 075 (customer care team)
   Roche: 1800 633 457 (pump hotline)

Note: in general a pump failure can be managed by the family at home and should not require a call to the emergency service.

If no long-acting insulin is immediately available, short-acting insulin will be required every 2-3 hours via injection.

Going back to insulin pump therapy

After receiving a replacement pump, it is important to plan going back onto pump therapy.
The Optisulin dose should be halved the night prior to going back onto the pump.

**Please upload the new pump and call triage to have your pump settings checked.*