Exercise on Pump Therapy — non-AID insulin pump: the temp basal advantage

EXERCISE FRAMEWORK

The three variables that decide almost everything

IOB

Insulin on Board is variable #1

On a pump, you can lower both bolus IOB (by reducing meal dose) and basal IOB (by setting a temp basal). MDI users can only do the first.

BOLUS REDUCTION	TEMP BASAL	LEAD TIME
25-75%	**-50%**	**60-90 min**
pre-exercise meal · Rabasa-Lhoret	typical starting reduction	pre-exercise basal drop

Ref: Rabasa-Lhoret 2001 · West 2011 · Moser/Zaharieva 2024 EASD/ISPAD · Campbell 2015.

THE THREE MAJORS

- ✓ **1 · Insulin on Board.** Bolus IOB + basal IOB. Pumps let you adjust both - but basal changes take 60-90 min to show effect.
- ✓ **2 · Starting glucose.** Same as MDI - where you start shapes where you land.
- ✓ **3 · Trend arrows.** Direction + speed still matter. Flat-line exercise is rare.
- ✓ **Temp basal is your pump-specific lever.** 50% reduction 60-90 min pre-exercise is the standard starting point.
- ✓ **Disconnection** is an option for short high-intensity sessions - know your pump's basal deficit recovery.

PRE-EXERCISE · THE TEMP BASAL TIMING

When to start reducing basal

SESSION TYPE	TEMP BASAL	START	DURATION
Moderate aerobic 30-60 min	-50%	60-90 min pre	Until 60 min post
Long aerobic > 60 min	-50 to -80%	90 min pre	Until 2 h post
Short high-intensity	Consider disconnection	Before session	Max 60 min off
Evening exercise	-30 to -50%	During + until bed	Protects overnight

Temp basal on its own is rarely enough. Combine with pre-meal bolus reduction (if exercise is within 90 min of a meal) and mid-session carbs.

PRE-EXERCISE · STARTING GLUCOSE

Treat pump and MDI the same way here

GLUCOSE AT START	ACTION (MODERATE AEROBIC, 30-60 MIN)
< 5.0 mmol/L	15-30 g carb, re-test. Temp basal -50% already in effect.
5.0-7.0	10-20 g carb, start with caution.
7.0-10.0	Start as planned. Likely ideal.
10.0-15.0	Start. Consider a small correction if trending up. Check ketones if high for hours.
> 15.0	Delay if ketones present. Check set - pump failure is the #1 cause of unexplained highs.

PUMP DISCONNECTION

When to disconnect, when not to

- **Disconnect for < 60 min** - acceptable basal deficit. Resume at set rate afterwards.
- **Disconnect for contact sports** - pump safety trumps basal continuity for short sessions.
- **Swimming** - most pumps not fully waterproof. Disconnect or use a waterproof case.
- **Do not disconnect > 60 min** without a top-up correction - basal deficit becomes clinically significant.
- **Omnipod is waterproof** - no disconnection needed for swimming.

TREND ARROWS + TEMP BASAL INTERACTION

Reading the arrow through the algorithm-free lens

- **Rising arrow pre-exercise** - your temp basal will amplify once the excursion peaks. Usually no extra action.
- **Flat arrow** - baseline. Follow the timing table.
- **Falling arrow** - temp basal + carbs. 15-20 g even if glucose is in range.
- **Two arrows down** - treat as pre-hypo. Delay, retest, restart temp basal later.

SURVIVE & THRIVE · EXERCISE SERIES

Exercise on Pump Therapy — during, after, and overnight

DURING EXERCISE · CARBS IN

Combine temp basal with fuel

Temp basal reduces insulin supply. Carbs replace glucose burned. The two together stop hypos.

- **Light 30-60 min:** 10-15 g every 30 min if glucose falling.
- **Moderate 30-60 min:** 15-30 g every 30 min.
- **Heavy / prolonged > 60 min:** up to 1 g/kg/hour (Riddle 2000).
- **Intermittent high-intensity** - glucose often rises from sprints. Less carbs during, more attention post-session.

NON-CARBOHYDRATE COUNTER-REGULATION

The 10-second sprint trick

A brief maximal sprint at the end of moderate exercise attenuates the post-exercise glucose drop without extra carbs (Bussau 2006). Useful if temp basal is already protecting you and you'd rather not stack more food on top.

Iscoe & Riddell extend the principle: intermittent high-intensity intervals within continuous moderate exercise reduce the overall glucose fall. Pump advantage - temp basal covers the intermittent-intensity risk.

POST-EXERCISE & OVERNIGHT

Sustained temp basal reduction - the pump advantage

On MDI, you can't reduce basal. On a pump, you can - and this is where the biggest overnight hypo protection comes from.

- **Keep temp basal -30 to -50% for 2-6 hours post-exercise** after significant sessions.
- **Evening exercise:** consider -30% temp basal until morning.
- **Bedtime snack 0.4 g/kg** slow carbs (Campbell 2015) even with temp basal - they work together.
- **Mixed-macronutrient snack** (milk + oat biscuit) outperforms quick carbs for overnight stability (Kalergis 2003).
- **Set a 3am alarm** for the first few sessions of any new activity until you know your pattern.

MAJOR IN THE MAJORS · THE TWO ACTIONS

Model before you act

ACTION 1 — **Exercise IOB - carbs for 30 min exercise**
Bolus IOB + basal IOB. Pump-specific calculation. Plans your carb load. →

ACTION 2 — **Exercise Planning Explorer**
Temp basal + bolus reduction + carbs, modelled for your pump and session. →

GO DEEPER

GNL explorers, guides & podcasts

GUIDE — **Full Exercise Guide - 5-part series**
Aerobic, mixed, anaerobic and AID + exercise. →

EXPLORER — **Activity Explorer - 10, 20, 30 min walking**
When exercise is the treatment for a high. →

ASK — **Grace - evidence-backed Q&A**
Rabasa-Lhoret, Bussau 10s sprint, Moser/Zaharieva 2024. →