

# Managing Type 1 Diabetes in the Active and Athletic Patient

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June 24, 2026



## Disclosures

- I have no relationships to disclose.



# Outline

## 1. Glycemic trends with exercise (normal vs DM1)

- Aerobic vs anaerobic
- Exercise order (AR vs RA)

## 2. Peri-exercise insulin management

- MDI
- Insulin pumps
- Hybrid/untethered approach

## 3. Pre-exercise blood glucose targets & insulin adjustments

## 4. During & after exercise management

## 1. Technology: CGM & closed-loop systems

## 2. Competition day considerations

## 3. Personal insights & practical pearls

# Normal Glucose Metabolism in Response to Exercise

At the start of exercise, BG may fall briefly, then is buffered by:

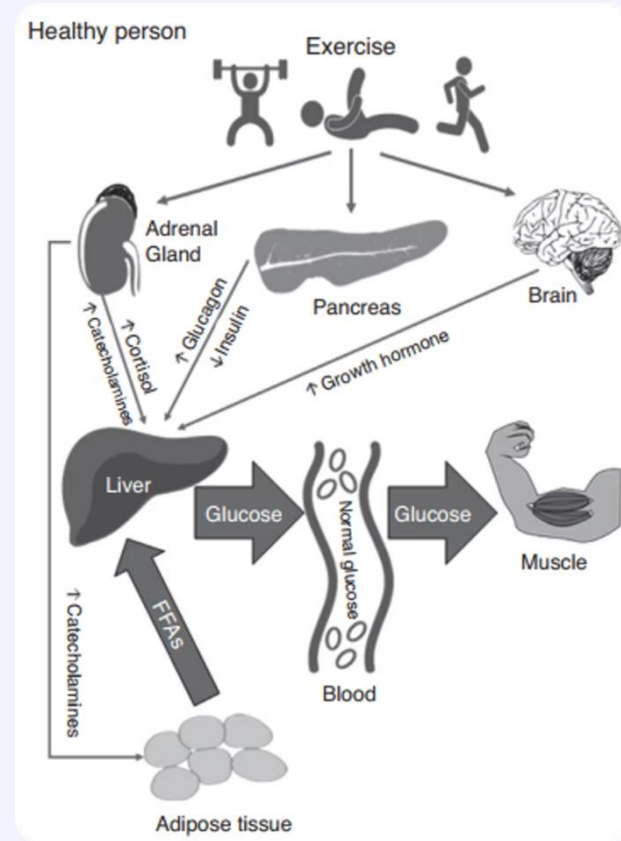
- ↓ insulin
- ↑ glucagon
- ↑ catecholamines

This drives fuel mobilization from:

- FFAs from adipose tissue
- Glycogen stores:
  - Liver
  - Skeletal muscle via contraction, Ca<sup>2+</sup> signaling, and ↑ AMP

BG stays stable during exercise; insulin rises afterward to support glucose storage.

Reference: Exp Physiol. 2020; 105(4):590-599



# Glucose Metabolism in Response to Exercise in DM1

Plasma insulin depends on exogenous insulin.

During exercise, compared with people without DM1:

- Exogenous insulin → ↓ hepatic glycogen breakdown
- Muscle still breaks down glycogen independently of insulin

Blood glucose tends to fall:

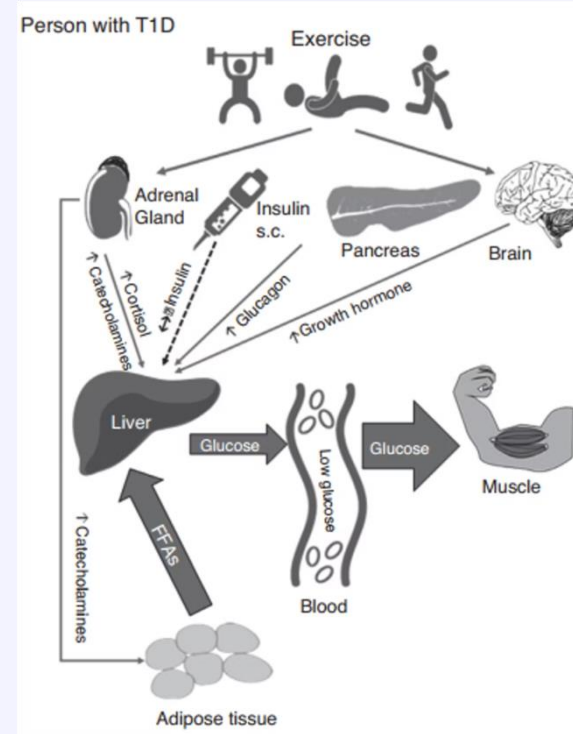
- Especially with moderate-intensity exercise
- Catecholamines usually prevent overt hypoglycemia

After exercise, hyperglycemia can occur when insulin would normally rise:

- Especially after high-intensity exercise

Patients with T1D are at risk for both exercise-associated hypo- and hyperglycemia.

Reference: Exp Physiol. 2020; 105(4):590-599



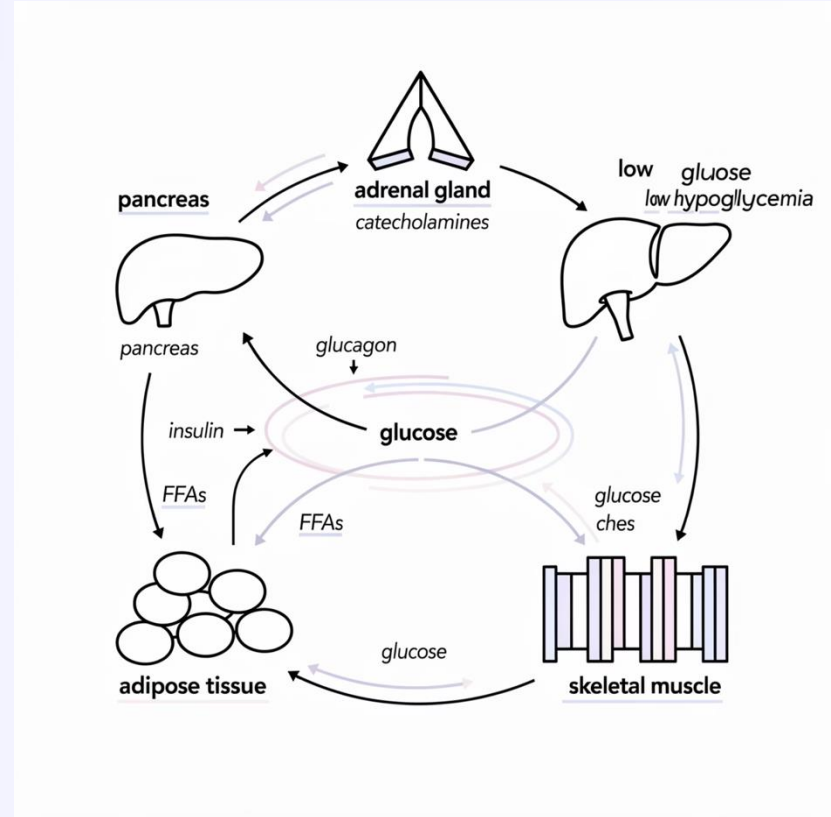
# Aerobic vs Anaerobic Glucose Trends

- Aerobic exercise lowers BG
- Anaerobic exercise raises BG via catecholamines
- Mixed activity often stabilizes glucose

Responses vary by:

- Duration and intensity
- Starting BG
- Fitness level
- Insulin, glucagon, and other counter-regulatory hormones
- Nutritional status

Reference: Riddell et al. Lancet Diabetes Endocrinol 2017; 5: 377–90



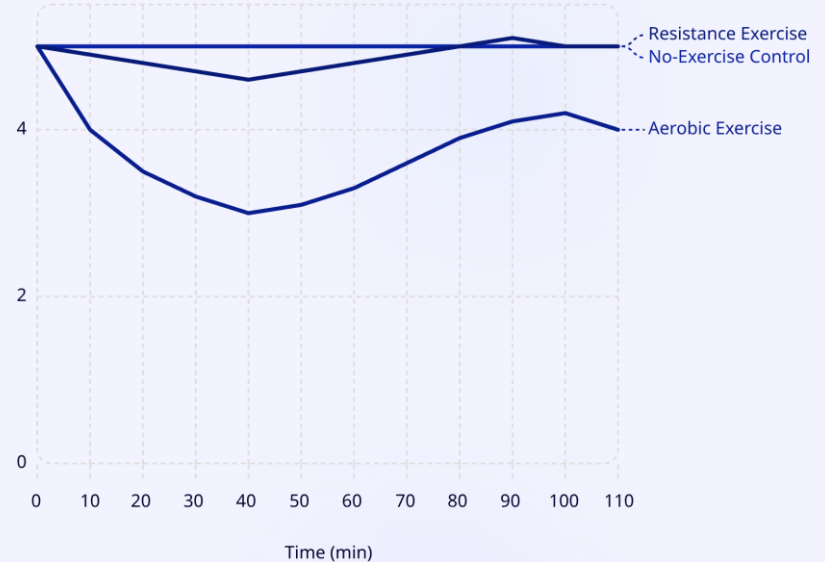
# Aerobic vs Anaerobic Glucose Trends (continued)

## Aerobic:

- BG drops quickly, then rises slightly post-exercise
- Prolonged aerobic exercise can deplete glycogen and cause hypoglycemia within ~45 mins without prevention
- Prevent hypoglycemia with more carbohydrate before/during exercise and less insulin

## Resistance exercise:

- Usually does not cause hypoglycemia, but responses vary
- Can cause a slight BG drop from increased uptake or a slight rise during/after exercise from catecholamines
- Later-day exercise may increase overnight hypoglycemia risk

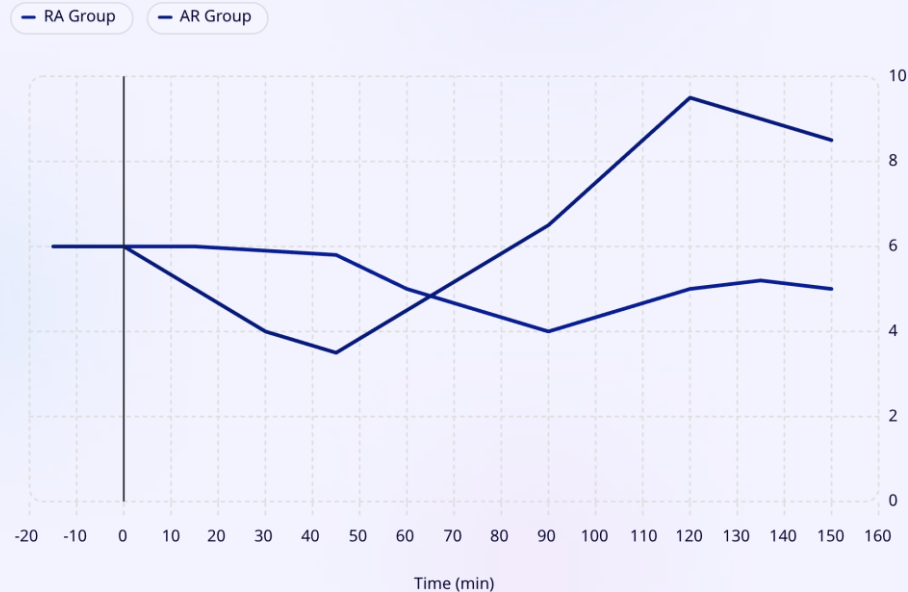


Plasma glucose trends (mmol/L) over 110 minutes of exercise and recovery: resistance, aerobic, and no-exercise control.

Reference: Yardley et al. Diabetes Care. 2013; 36:537

# Effects of Performing Resistance Exercise Before Versus After Aerobic Exercise on Glycemia in Type 1 Diabetes

Reference: Yardley et al. Diabetes Care. 2012;35(4):669-75.



Plasma glucose trends (mmol/L) during exercise and recovery, comparing aerobic-resistance (AR) vs resistance-aerobic (RA).

**X-axis phases:** -15 to 0 min (Rest), 0 to 45 min (Exercise 1), 45 to 90 min (Exercise 2), 90 to 150 min (Recovery).

## Study Details:

- 12 active adults with DM1 (10M/2F; 5 MDI/7 pumps)
- 45 min aerobic run at 60% VO<sub>2</sub> max
- 45 min resistance session: 7 exercises, 8 reps x 3 sets
- Each participant completed both AR and RA, 5+ days apart

## AR Group Results:

- BG fell during aerobic exercise
- BG rose during resistance exercise
- BG rose further in recovery
- More nocturnal hypoglycemia

## RA Group Results:

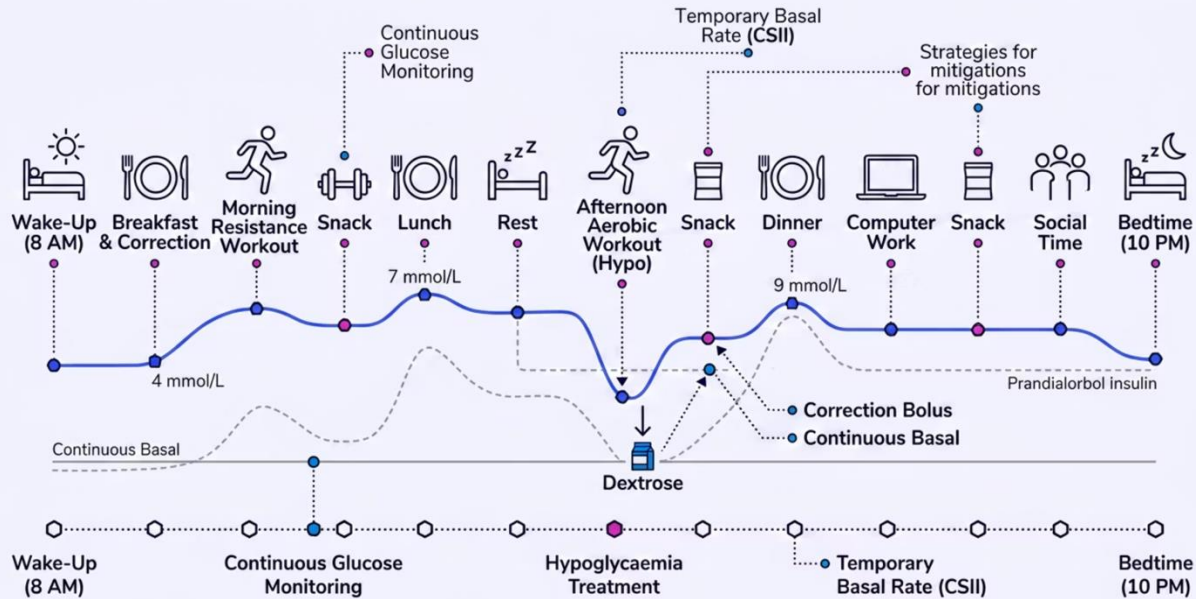
- BG stayed stable during resistance
- BG declined during aerobic exercise, but later
- Smaller recovery rise

## Conclusion:

- Aerobic-first improved glycemic stability and reduced postexercise hypoglycemia
- Consider RA for athletes prone to exercise-induced hypoglycemia

Now that we understand the pathophysiology and trends, how should we advise our athletes?

# Peri-exercise Insulin and CHO Intake Management is Highly Individualized!



Annotations show continuous glucose monitoring, prandia/bolus correction insulin, basal insulin, and hypo - and hyperglycaemia mitigation strategies.

Essential supplies: glucose meter, lancets/lancing device, CGM, insulin (needles or pump supplies), carbohydrate snack, gluca gon, and medical ID.

Reference: Riddell et al. Diabetologia (2020) 63:1475–1490

Why This Matters

# Exercise Is Medicine — But T1D Adds Complexity

## The Opportunity

Regular physical activity improves insulin sensitivity, cardiovascular health, weight management, and psychological well-being in Type 1 diabetes. As a primary care provider, you're often the first and most trusted clinician to guide these conversations.

## The Challenge

People with T1D must actively manage insulin, carbohydrate intake, and glucose targets around exercise. The physiology is nuanced, the technology is evolving, and the stakes are high.



You don't need to be an endocrinologist — know the principles, spot red flags, and refer when needed.

## Lecture Outline

# What We'll Cover Today

01

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### Exercise Physiology

Aerobic vs. anaerobic activity changes blood glucose differently.

03

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### During-Exercise Carbohydrate Strategies

ExCarbs, weight-based dosing, and timing.

05

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### CGM & Automated Insulin Delivery (AID)

Trend arrows, remote monitoring, and system comparisons.

02

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### Pre-Exercise Glucose Targets

Safe starting ranges, ketone checks, and when to delay exercise.

04

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### Post-Exercise Hypoglycemia Prevention

The 8–16 hour window, nocturnal risk, and overnight strategies.

06

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### Competition Day & Practical Pearls

Adrenaline effects, conservative dosing, and PCP take-home points.

# How Exercise Changes Glucose Dynamics in T1D

In people without diabetes, exercise lowers insulin, raises glucagon, and matches hepatic glucose output to muscle uptake. In T1D, exogenous insulin can't adjust in real time, creating predictable management challenges.

## ▼ Insulin Sensitivity ↑

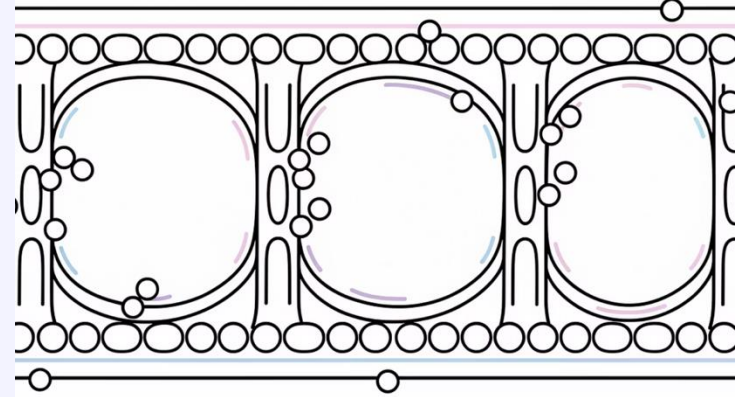
Exercise increases GLUT-4 translocation and muscle glucose uptake, independent of insulin.

## ⚡ Hepatic Output

The liver releases glycogen during exercise; in T1D, this response may be blunted or exaggerated based on insulin levels.

## 🕒 Timing Matters

Active insulin-on-board (IOB) at exercise start is the strongest predictor of hypoglycemia risk.



# Aerobic vs. Anaerobic: Opposite Glucose Effects

## Aerobic Exercise

**Examples:** Running, cycling, swimming, hiking

**Glucose effect:** Typically **lowers** blood glucose as muscle uptake exceeds hepatic output.

**Hypoglycemia risk:** High, especially with active bolus insulin on board

**Onset of risk:** During activity and up to 16+ hours after

## Anaerobic / High-Intensity Exercise

**Examples:** Sprinting, weight training, HIIT, competitive team sports

**Glucose effect:** Often **raises** blood glucose acutely via epinephrine, cortisol, and glucagon.

**Delayed risk:** Post-exercise hypoglycemia can still occur hours later as glycogen is replenished

- ❏ Mixed-sport athletes, like soccer or basketball players, can experience both effects in one session.

# Pre-Exercise Glucose Targets: Updated ADA Guidance

Start exercise in a safe glucose range – but "safe" is not a single cutoff. **Hyperglycemia alone is NOT an absolute contraindication to exercise.**



## Adults: Acceptable Range

**90–250 mg/dL** – generally safe to start.  
Use glucose trend and IOB to guide carbs  
and insulin reduction.



## Pediatric / Adolescent

**126–180 mg/dL** – preferred pre-exercise  
target. Narrower range due to greater  
variability.



## When to Postpone Exercise

Postpone for significant hyperglycemia  
with **ketosis or insulin deficiency** – not  
for hyperglycemia alone.

⊗ **Check ketones if glucose >250 mg/dL.** Postpone exercise if moderate-to-large urine ketones or blood beta-hydroxybutyrate >1.5 mmol/L.  
Ketosis – not hyperglycemia alone – is the main safety concern.

# Insulin Adjustments Before Exercise

## Reducing Bolus Insulin


For planned aerobic exercise within 60–90 minutes of a meal, reduce the pre-meal bolus by **25–75%** based on intensity, duration, and glucose trend. There is no universal formula.

## Reducing Basal (Pump Users)

For insulin pump users, a temporary basal reduction of 50–80% started **60–90 minutes before** aerobic exercise works better than reducing at onset.

## Key Principle: Active Insulin on Board (IOB)

IOB at exercise onset is the strongest predictor of hypoglycemia risk. Even modest active bolus insulin can sharply increase glucose-lowering during sustained aerobic activity.

 Avoid large meal boluses within **2–3 hours** of planned prolonged aerobic activity when possible.

## PCP Pearl

Ask active T1D patients: *“What do you usually do with your insulin before you work out?”* It quickly reveals their strategy and gaps.

# The ExCarbs Concept: Carbohydrates as the Primary Fuel Lever

When insulin can't be reduced in real time, carbohydrate intake is the main tool to prevent hypoglycemia during sustained aerobic exercise. The **ExCarbs** framework gives weight-based guidance.



## Adults

**~0.5 g carbohydrate / kg / hour**

Example: A 70 kg adult needs about **35 g/hour** of moderate aerobic exercise



## Youth

**~1.0 g carbohydrate / kg / hour**

Children need about double the adult rate per kg during exercise



## Bolus Proximity Effect

Needs are **higher** if exercise starts within **3 hours of a meal bolus** because of residual insulin

### Body Weight

### Adult (0.5 g/kg/hr)

### Youth (1.0 g/kg/hr)

### Common Source

40 kg

20 g/hr

40 g/hr

1 gel + sports drink

60 kg

30 g/hr

60 g/hr

2 gels or banana

70 kg

35 g/hr

70 g/hr

Sports drink + chews

90 kg

45 g/hr

90 g/hr

Gel + banana + drink

# The Danger Zone: Post-Exercise Hypoglycemia

⊗ **Most exercise-related severe hypoglycemia happens AFTER exercise – not during it.**

## Why It Happens

After prolonged or high-intensity exercise, muscle glycogen is depleted. Glucose uptake for **glycogen resynthesis continues for 8–16 hours post-exercise**, raising hypoglycemia risk overnight. Prior hypoglycemia also blunts counter-regulatory responses.

## Overnight Strategies

- Check glucose before bed – target >130 mg/dL after prolonged activity
- Use a bedtime snack with complex carbohydrates + protein
- Reduce overnight correction doses; use conservative insulin-to-carb ratios
- Set CGM low alert higher, e.g. 80 mg/dL, after intense evening activity
- Use overnight CGM monitoring or remote sharing

# Continuous Glucose Monitors: The Athlete's Advantage

CGM has changed exercise management in T1D. During activity, trends matter more than single readings.



## Trend Arrows

Rate-of-change data adds crucial context. A glucose of 140 mg/dL with a falling arrow needs carbs; a flat 140 does not.



## Confidence & Compliance

CGM use increases exercise participation and confidence. Fewer fingersticks mean less disruption.



## Remote Monitoring

Coaches, parents, and training partners can track glucose in shared apps during workouts or competition.



## Exercise-Specific Alerts


Set tighter low and high alerts around training and competition.

**Practical Interpretation:** Falling arrow (↓↓) before exercise → take 15–20 g carbohydrate. Rising arrow (↑↑) before competition → avoid overcorrection; stress hormones may settle it naturally.

# Automated Insulin Delivery (AID) Systems & Exercise

AID systems are a major advance in T1D care – but they are **not fully autonomous**. All current systems still require proactive user input around exercise.

System	Omnipod 5	Tandem Control-IQ+	MiniMed 780G
<b>Exercise Mode Target</b>	~150 mg/dL (Activity Mode)	140–160 mg/dL (Exercise Mode)	~150 mg/dL (Temp Target)
<b>Activation Timing</b>	1–2 hours before aerobic exercise	Activate before exercise; temp rates can be used while automation stays active	Set temp target 1–2 hours before activity
<b>Key Caution</b>	May still give correction if glucose rises sharply	Avoid large pre-exercise carb loads that may trigger automatic correction boluses	Algorithm keeps learning; overnight adjustments may still occur

 **Key Teaching Pearl:** All current AID systems still need exercise planning and user adjustments. "Set it and forget it" is not yet possible for active patients with T1D.

# What to Advise Your Athlete with an Insulin Pump...

## If the pump can stay...

- Reduce basal rate by 50–80%, 90 minutes before exercise
- Resume basal insulin immediately post-exercise, before the post-workout meal
- Adjust further based on individual trends

## If the pump has to be removed (contact, collision, or water sports)...

- Can “just go for it”
- Use a hybrid approach if needed:
  - Ultra-long-acting insulin (50%)
  - Reduced pump basal delivery (50%)

# FIT Untethered Trial — Hybrid Insulin Regimen for Active T1D Athletes

**Reference:** Lancet Diabetes Endocrinol 2020; 8: 511–23

**Full citation:** Flexible insulin therapy with a hybrid regimen of insulin degludec and continuous subcutaneous insulin infusion with pump suspension before exercise in physically active adults with type 1 diabetes (FIT Untethered): a single-centre, open-label, proof-of-concept, randomised crossover trial

**Authors:** Ronnie Aronson, Aihua Li, Ruth E Brown, Sarah McGaugh, Michael C Riddell

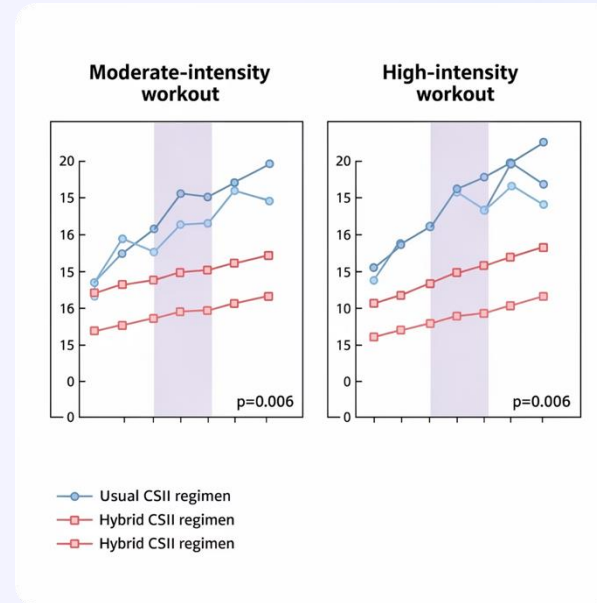
## Study Design

- RCT of 24 active adults with T1D on pumps, crossover design
- Control: usual pump regimen
- Hybrid: 50% basal via pump + 50% via insulin degludec SQ qAM
- Pumps suspended 60 min pre-exercise and reconnected immediately after

## Intervention Period

- Week 1: one moderate-intensity and one high-intensity in-clinic session
- Weeks 2–4: four high-intensity and two moderate-intensity home sessions/week

## Key Result: Time in Glucose Range (3.9–10.0 mmol/L) Through 6 Hours Post-Exercise



The hybrid group spent more time in range during and up to 6 hours after exercise.

- **Moderate-intensity workouts:** 64% vs 40% ( $p=0.006$ )
- **High-intensity workouts:** 66% vs 50% ( $p=0.04$ )

# Training Day vs. Competition Day: The Adrenaline Variable

Competition day physiology differs from training. Epinephrine, cortisol, and glucagon can raise glucose before activity even starts, making this the most common cause of unexpected excursions on race or game day.

## Training Day

Glucose response is predictable. Insulin and carb adjustments are based on experience, and hypoglycemia is the main concern.

## Competition Day

Adrenaline can raise glucose 50–100+ mg/dL before the starting gun. **Target a slightly higher starting glucose (150–180 mg/dL).** Avoid aggressive pre-competition corrections.

### → Use warm-up activity

A 10–15 minute moderate warm-up can blunt the adrenaline spike and help calibrate CGM.

### → Conservative correction doses only

Use 50% or less of calculated correction doses pre-competition. A missed correction is recoverable; hypoglycemia mid-race is not.

### → Avoid excess insulin before competition

Nervousness often drives unnecessary dosing. Trust the pre-exercise plan, not the glucose meter alone.

# Some Personal Insights...

## 1. The Psychological and Emotional Side

- Many athletes with T1D feel pressure to "look fine" and not seem "weak" or "unreliable."
- Fear of lows can be more limiting than the lows themselves. Some athletes run high for safety, but 250-300+ significantly hurts performance and raises A1Cs.

## 2. How Lows and Highs Feel (and Why They Matter)

- Low blood sugar: shaky legs, disorientation, slurred speech, racing heart. Treat immediately; recovery is usually within 15 minutes.
- High blood sugar: irritability, headache, thirst, fatigue, "heavy legs." Athletes can push through, but performance and focus drop.

## 3. The Art of Staying in Range (42 factors on BG)

- Log blood sugars, insulin, and food on practice vs. competition days. Patterns emerge, and the most effective T1D athletes adjust, observe, and iterate.

## 4. Nutrition

- People with T1D can eat anything, but blood sugar is easier to manage with less processed, healthier options.

Credit: Lauren Bongiorno – <https://www.riselyhealth.com/>

## 42 Factors Affecting Blood Glucose

Category	Factor	Effect	
Food	1. Carbohydrates	↑	
	2. Fat	↓	
	3. Protein	↓	
	4. Fiber	↓	
	5. Hydration	↓	
	6. Alcohol	↓ then ↑	
	7. Sugar-sweetened beverages	↑	
	8. Processed foods	↑	
	9. Meal Timing	↓	
Medication	10. Insulin Dose	↓	
	11. Insulin Type/Speed	↓	
	12. Insulin Site Absorption	↓	
	13. Other Medications (e.g., Steroids)	↑	
	14. Incorrect Dosing	↑ or ↓	
	Activity	15. Aerobic Exercise	↓
		16. Anaerobic Exercise	↑
		17. Exercise Intensity	↓
	18. Exercise Duration	↓	
	19. Pre-exercise Fuel	↑	
	Biological	20. Stress Hormones	↑
		21. Illness/Infection	↑
22. Hormonal Changes		↓	
23. Sleep Quality		↓	
24. Dawn Phenomenon		↑	
25. Somogyi Effect		↑	
26. Insulin Resistance		↑	
27. Organ Function (Liver/Kidney)		↓	
28. Adrenaline		↑	
29. Growth Hormones		↑	
30. Thyroid Hormones		↓	
31. Dehydration		↑	

# Resources

Lundgren JA and Kirk SE. Chapter 18: The Athlete with Diabetes

Trojian et al. "American Medical Society for Sports Medicine Position Statement of Care of the Athlete and Athletic Person With Diabetes." *Clin J Sport Med* 2022;32:8–20

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Reddy R, Wittenberg A, Castle JR, El Youssef J, Winters-Stone K, Gillingham M, Jacobs PG. Aerobic and resistance exercise: effects on glycemic control in adults with type 1 diabetes. *Can J Diabetes*. 2019 Aug;43(6):406-414.e1.

Cockcroft EJ, Narendran P, Andrews RC. Exercise-induced hypoglycaemia in type 1 diabetes. *Exp Physiol*. 2020;105(4):590-599.

Hughes MS, Addala A, Buckingham B. Digital Technology for Diabetes. *N Engl J Med*. 2023 Nov 30;389(22):2076-2086. doi: 10.1056/NEJMra2215899. PMID: 38048189; PMCID: PMC12333919.

# High-Intensity & Resistance Exercise: The Glucose Paradox

## Why Glucose Rises

Maximal-intensity exercise triggers catecholamine release, especially epinephrine, which rapidly drives hepatic glycogenolysis. Glucose can rise 50–100 mg/dL within minutes and stay elevated for 1–2 hours after exercise.

Common triggers include weight training, sprinting, and competitive team sports.

## Management Strategy

**During activity:** Avoid overcorrecting; the rise is usually transient.

**Post-activity:** Glucose often falls as glycogen replenishment begins. A small correction dose 60–90 minutes after exercise may help, with caution.

**Mixed sessions:** Ending with 5–10 minutes of moderate aerobic exercise can blunt the post-resistance spike before a correction bolus.

- ☐ This glucose rise can catch patients and families off guard. Counseling helps prevent panic dosing.

## Special Populations

# Pediatric & Adolescent Athletes: Higher Stakes, Different Targets

### Narrower Target Range

Preferred pre-exercise glucose: **126–180 mg/dL**. Children have more variability and less hypoglycemia awareness, so adults must watch closely.

### Higher ExCarbs Need

**~1.0 g carbohydrate/kg/hour** during aerobic exercise – about double the adult rate. Keep fast-acting glucose available.

### Team Communication

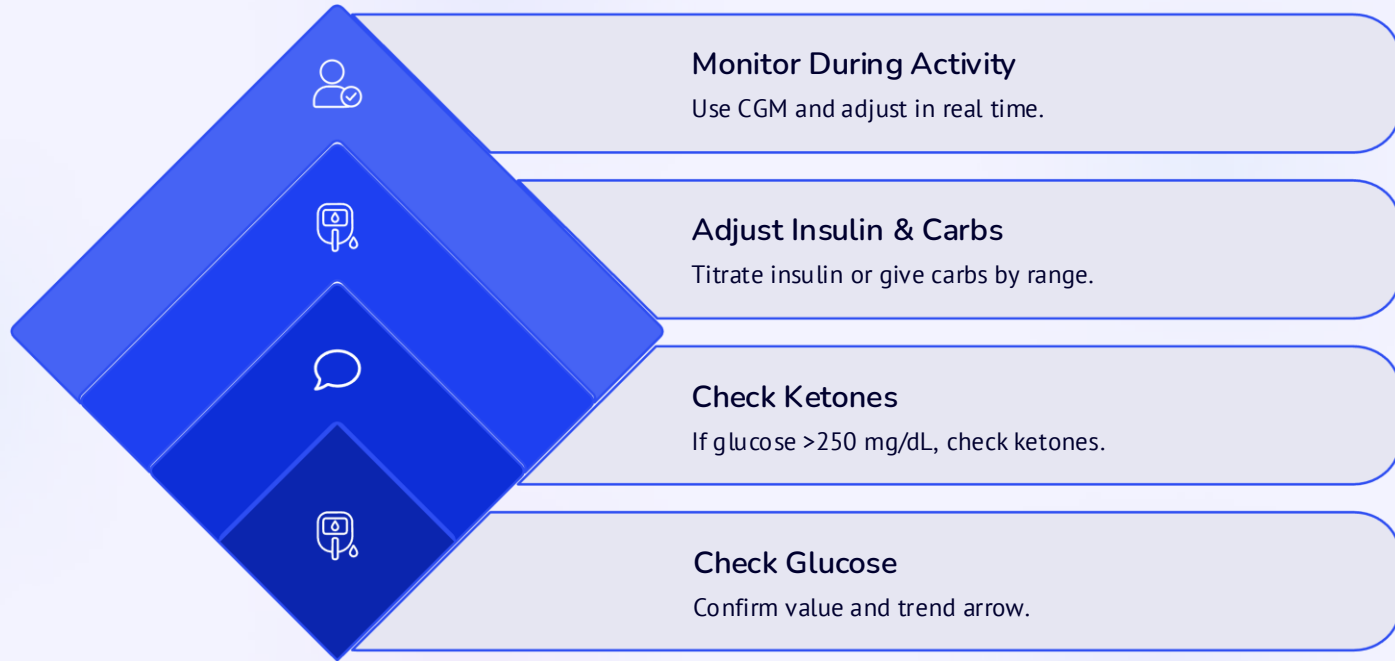
Coaches, athletic trainers, and teammates should know the athlete has T1D, recognize low glucose, and know where supplies are kept.

### Overnight Risk

After evening practices or games, parents should monitor CGM remotely. Bedtime glucose targets should be higher than baseline after intense activity.



## A Pre-Exercise Decision Framework for the PCP



Use this framework to counsel patients or review exercise logs. Focus on starting glucose, trend direction, insulin on board, and ketones.



**Actionable Pearl:** Print or share this algorithm with active T1D patients. It gives them a repeatable pre-workout decision structure.

## Hypoglycemia Management

# Recognizing & Treating Exercise-Related Hypoglycemia

### During Exercise (<70 mg/dL)

**Stop activity immediately.** Take 15–20 g fast-acting carbohydrate (glucose tabs, gel, juice), then recheck in 15 minutes. Don't resume until glucose is >100 mg/dL and stable.

Symptoms may be blunted during intense exercise because of adrenaline, so CGM low alerts are critical.

⊗ Don't rely on symptoms alone. CGM alerts provide an objective safety signal.

### Glucagon Access

All active T1D patients should have **rescue glucagon** at training and competition sites. Nasal glucagon and auto-injectors are easier for coaches and bystanders to use.

Train the team: coaches and athletic trainers should know where it is and how to give it.

### Post-Episode Protocol

After significant hypoglycemia during or after exercise, reduce basal/bolus insulin by 10–20% for the next 24 hours and review CGM trends.

## Real-World Context

# What PCPs Encounter in Clinic

**"My patient wants to train for a marathon. What do I tell them?"**

Encourage it – with a plan. Refer to endocrinology for insulin adjustments, ensure CGM use, and review ExCarbs plus the 8–16 hour post-exercise hypoglycemia window.

**"They're on an AID system. Isn't it automatic now?"**

No. AID reduces risk, but exercise mode, timing adjustments, and carb planning still matter.

**"Their glucose was 280 before soccer practice. Should they skip it?"**

Check ketones first. If negative and they feel well, they can proceed with close monitoring; postpone only if ketosis or major insulin deficiency is present.

## Pattern Recognition

# Using CGM Data at Clinic Visits

## What to Review

For active T1D patients at routine visits, request the CGM ambulatory glucose profile (AGP). Focus on exercise days and look for hypoglycemia patterns after training.

- Consistent post-exercise lows?
- Nocturnal hypoglycemia after evening workouts?
- Pre-exercise glucose too low or too high?
- Time-in-range during exercise windows?

CGM patterns – not HbA1c alone – should guide exercise adjustments.

## Metrics That Matter for Athletes

**Time in Range (TIR):** >70% in 70–180 mg/dL

**Time Below Range (TBR):** <4% below 70 mg/dL; <1% below 54 mg/dL

**Coefficient of Variation (CV):** <36% indicates stable variability

**GMI (Glucose Management Indicator):** CGM-derived A1C estimate when lab draws are infrequent

# PCP Take-Home Pearls: T1D & Exercise

**1** Exercise responses are individualized

No universal protocol exists. Have patients track exercise logs to find their glucose patterns.

**3** Ketosis — not hyperglycemia alone — is the safety line

Don't reflexively skip exercise for high glucose. Check ketones and educate accordingly.

**2** Aerobic lowers glucose; anaerobic may raise it

Activity type helps predict glucose direction and plan pre-exercise prep.

**4** Most hypoglycemia occurs hours after exercise

The 8–16 hour window is highest risk. Use overnight monitoring and conservative bedtime corrections after prolonged activity.

# More Pearls: Technology, Patterns & Partnerships



## CGM Data Is Invaluable

Trend arrows give real-time guidance that single glucose checks miss.  
Encourage CGM use in active T1D patients.



## AID Helps — But Is Not Autonomous

Automated systems lower risk, but exercise mode and carbohydrate planning still matter.



## Pattern Recognition Is the Key

Use CGM trends across multiple sessions, not one data point, to guide personalized insulin and carb adjustments.




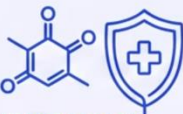


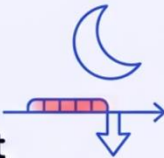



## Know When to Co-Manage

Competitive, high-volume, or highly variable athletes may need a DCES or endocrinologist experienced in sports.

✔ Your role as a PCP is to **counsel, encourage, and connect** — not manage every glucose nuance. This framework is high-yield, high-impact care.

## Key Takeaways at a Glance

<p><b>1</b> </p> <p><b>1) Responses are individualized</b></p>	<p><b>2</b> </p> <p><b>2) Aerobic exercise lowers glucose</b></p>	<p><b>3</b> </p> <p><b>3) Anaerobic exercise may raise glucose</b></p>	<p><b>4</b>  <b>KETOSIS</b></p> <p><b>4) Ketosis — not hyperglycemia — is the safety concern</b></p>
<p><b>5</b>  Adult Youth</p> <p><b>5) Pre-exercise targets: adults 90-250 mg/dL, youth, youth 126-180 mg/dL</b></p>	<p><b>6</b>  Adult Youth</p> <p><b>6) ExCarbs: 0.5 g/kg/hr adults, adults, youth 1.0 g/kg/hr</b></p>	<p><b>7</b> </p> <p><b>7) Most hypoglycemia occurs 8-16 hours 8-16 after exercise</b></p>	<p><b>8</b> </p> <p><b>8) AID systems help but require proactive planning</b></p>

# Active Patients With T1D Can — and Should — Exercise

With the right preparation and clinical support, patients with Type 1 diabetes can compete at every level — from recreation to elite sport. **Your guidance matters.**

## Counsel

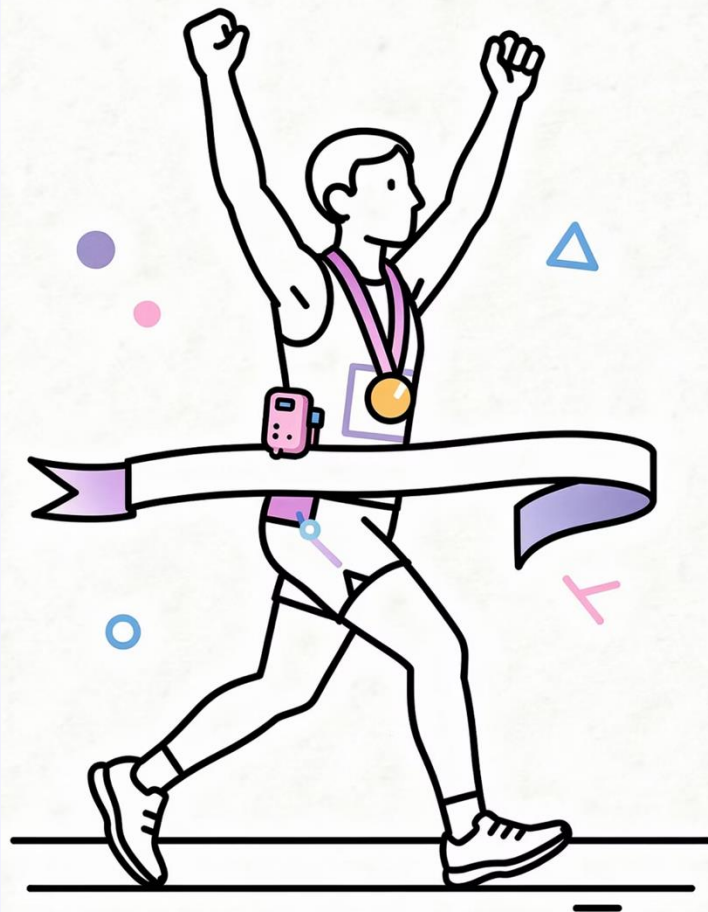
Set glucose targets, review ketone protocols, and discuss ExCarbs at active visits.

## Leverage Technology

Use CGM, review AGP reports, and know the AID system your patient uses.

## Collaborate

Co-manage complex athletes with endocrinology or a DCES. Know your referral resources.



# Questions?

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