# Exercise in type 1 diabetes

## Webinar for physicians and nurses treating type 1 diabetes

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## Meet the speakers

**Dr. Peter Adolfsson**
*Senior Physician at the Hospitals of Halland, Kungsbacka and Halmstad*

**Dr. Elina Pimiä**
*Head of Tampere Diabetes Outpatient Clinic and Chief Physician in the Finnish Diabetes Association*

**Kristina Grimstad Nordstrand**
*Powerlifting Champion with T1D*

**Prof. Bastiaan de Galan**
*Medical Specialist and Professor of Diabetology at the Maastricht University Medical Centre and the Radboud University Medical Centre*

## Key takeaways

- **Diabetes or hypoglycaemia should not be a barrier to start and continue exercise**
- **HCPs should be educated and give personalized support related to exercise to people with T1D**
- **Technology helps in diabetes management with proper knowledge and training**

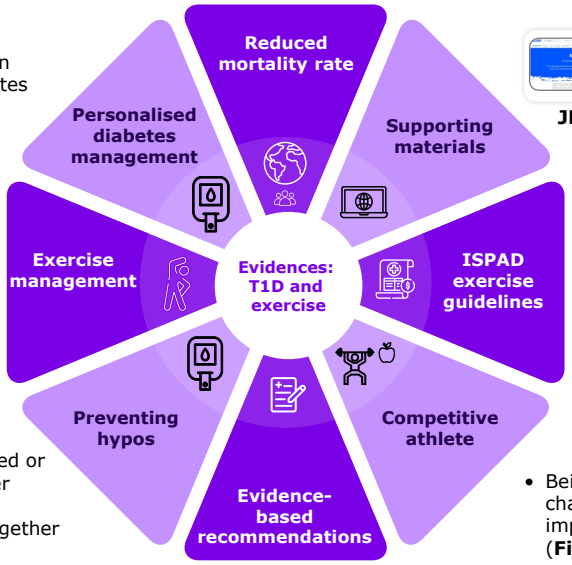
Exercising is important, but managing T1D before, during and after exercise is often challenging. It requires knowledge, different insulin dose and nutritional adjustments based on the form and intensity of the exercise. Loss of glycaemic control and fear of hypoglycaemia are also possible barriers where individuals with T1D need help. Therefore, HCPs and patients with T1D need to fully understand the effects of exercise on glucose control and further incorporate exercise as part of diabetes management.

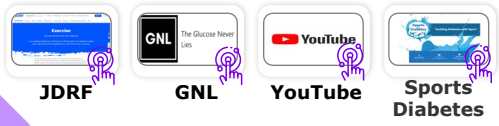
**To watch the replay of the webinar, CLICK HERE**

## Landscape of T1D and exercise

- Moving from sedentary to physical activity thrice a week seems to reduce the mortality risk more than what happens with reducing HbA1c[1]

- Each type of exercise has different outcome on glucose trend and requires personalized diabetes management[2,3]




- Variability is observed in blood glucose responses to different forms of exercise in people with T1D (**Fig 1**)[4]

- The guidelines cover many broad aspects of exercise and diabetes for children and adolescents with T1D and T2D[3]
- Describes insulin pump/MDI insulin adjustments and nutrition recommendations for before, immediately after and overnight for aerobic, mixed and anaerobic activity
- Guidance on AID systems and exercise

- CGM devices can provide intermittently scanned or real-time glucose data before, during and after exercise[5]
- Sensor glucose value should be interpreted together with the corresponding trend arrow

- Being a competitive athlete with T1D can be challenging, but several strategies can be implemented to help glycaemic management (**Fig 2**)[7]

According to 37 evidence-based clinical practice recommendations in AACE guideline[6]:
- CGM is recommended to everyone on insulin
- Lifestyle and other factors should be considered
- Real-time CGM is easier for anyone doing exercise

## *Kristina, a power-lifting athlete living with T1D*

***Kristina Grimstad Nordstrand*** is a powerlifting champion living with diabetes for around 15 years now, and combines exercise with diabetes management. In 2014, she started her powerlifting journey which eventually helped in stabilising her blood glucose levels.

### Needs of the clinics

- Deeper knowledge on T1D and exercise among clinicians and nurses
- Clear personalized guidance on what to do before, during and after exercise
- Motivation and understanding on the benefits of exercise

### Benefits of exercise

- Positive benefits to overall health
- Less glycaemic variability
- Improved quality of life

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## Tools & apps

Direct integration of CGM with smartwatch instead of transferring via smartphone

**Dexcom** offers direct integration with Apple Watch on the G7

In **AppEx,** a sensor sends respective values to the app and an alarm is triggered in critical situations signalling the amount of carbs or insulin needed


## Expert panel discussion

Aerobic/mixed/anaerobic exercises have different effects on glucose levels and require personalized diabetes management

- Sudden drop in blood glucose level
- Interruption in workout
- Availability of food instantly
- Hypoglycaemia during aerobic exercise
- Adrenaline and stress
- Hyperglycaemia during exercise

- Planning food/meals and timing
- Insulin treatment before and after exercise

**Hypoglycaemia is one of the major barrier to start and continue exercise**

## Hypoglycaemia management

### Insulin

- A wide range of insulin adjustment and nutrition strategies can be combined for optimal glucose management and to prevent exercise induced-hypoglycaemia[3]
- Duration of exercise and planning is important

### Technology

- Managing glucose levels when exercising might be challenging even with hybrid closed-loop pumps as exercise target optimally needs to be set well in advance of aerobic exercise[3]
- CGM and especially real-time CGM has many benefits when exercising but it is also important to understand the limitations and need of understanding glucose value[5]

✓ ***Clinicians should discuss with patients about the different types of exercise and their effect on glucose management and give personalized advice and encourage people with T1D to exercise***

**Fig 1. Variability in blood glucose responses to different forms of exercise in people with T1D**

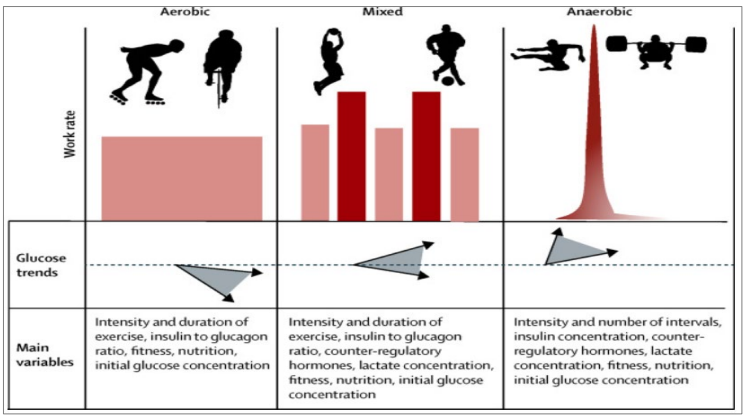
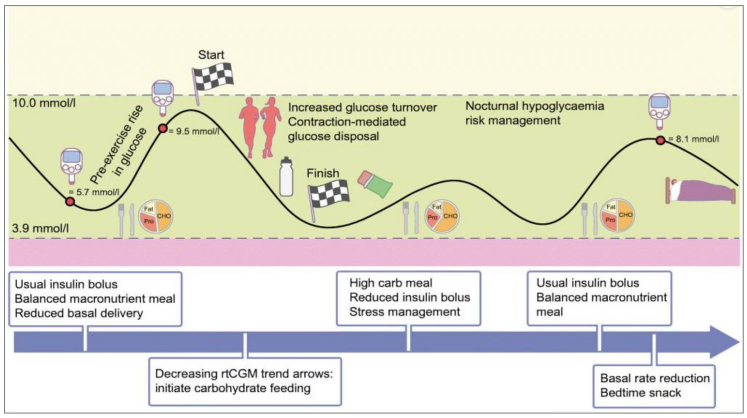



**Fig 2. The competitive athlete with T1D**




1. Reddigan JI, et al. *Diabetologia*. 2012;55(3):632-635; 2. Chetty T, et al. *Front Endocrinol (Lausanne)*. 2019;10:326; 3. Adolfsson P, et al. *Pediatr Diabetes*. 2022;23(8):1341-1372; https://pubmed.ncbi.nlm.nih.gov/36537529/; 4. Riddell MC, et al. *Lancet Diabetes Endocrinol*. 2017;5(5):377-390; 5. Moser O, et al. *Pediatr Diabetes*. 2020;21(8):1375-1393; https://pubmed.ncbi.nlm.nih.gov/33047481/; 6. Grunberger G, et al. *Endocr Pract*. 2021;27(6):505-537; 7. Riddell MC, et al. *Diabetologia*. 2020;63(8):1475-1490; https://pubmed.ncbi.nlm.nih.gov/32533229/.

AID, automated insulin devises; CGM, continuous glucose monitoring; GNL, glucose never lies; HbA1c, glycated haemoglobin; HCPs, healthcare professionals; ISPAD, International Society for Pediatric and Adolescent Diabetes; JDRF, Juvenile Diabetes Research Foundation; MDI, multiple daily injection; T1D, type 1 diabetes; T2D, type 2 diabetes.

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