

Exercise in type 1 diabetes

Webinar for physicians and nurses treating type 1 diabetes

sanofi



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.

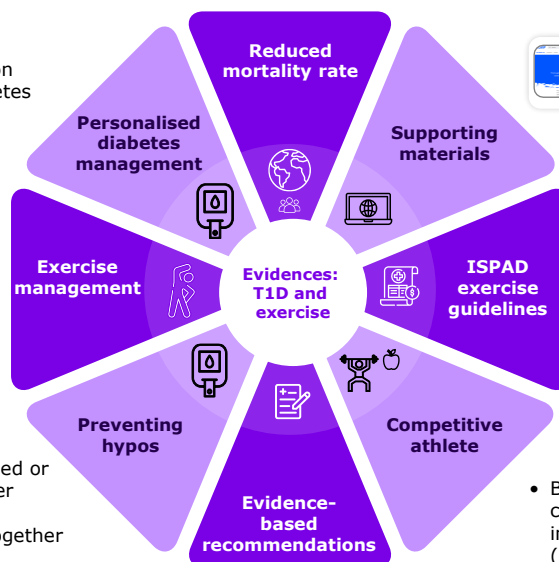
Landscape of T1D and exercise

- Moving from sedentary to physical activity thrice a week seems to reduce the mortality risk more than what happens with reducing HbA1c¹

- 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

- CGM devices can provide intermittently scanned or real-time glucose data before, during and after exercise⁵
- Sensor glucose value should be interpreted together with the corresponding trend arrow



- The guidelines cover many broad aspects of exercise and diabetes for children and adolescents with T1D and T2D³
- 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

- 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 guideline⁶:

- 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



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



Planning food/meals and timing



Hypoglycaemia during aerobic exercise



Adrenaline and stress



Hyperglycaemia during exercise



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-hypoglycaemia³
- 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 exercise³
- 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 value⁵

✓ **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

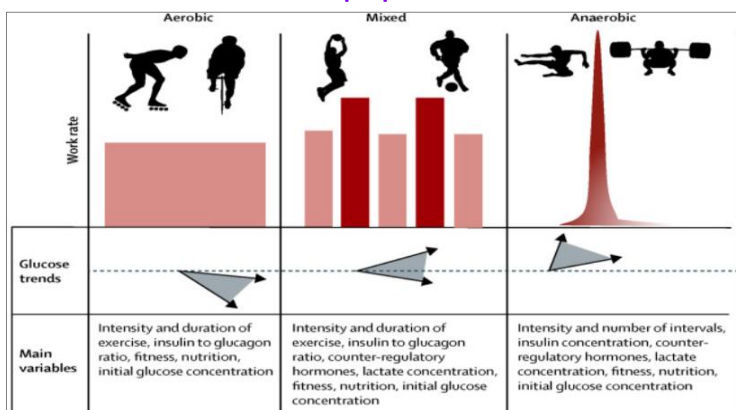
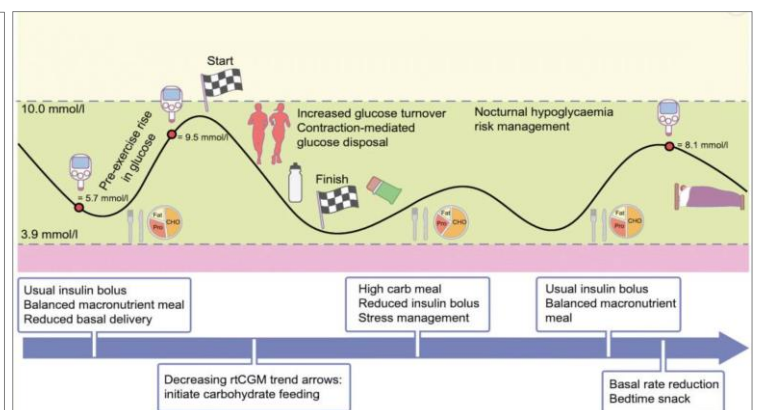


Fig 2. The competitive athlete with T1D



1. Reddigan JJ, 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 devices; 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.