One man, his bike and a 1000 km trip through the Rhône-Alpes and Pyrenees. How to manage type 1 diabetes during an endurance challenge

John Grumitt

Citation: Grumitt J (2015) One man, his bike and a 1000 km trip through the Rhône-Alpes and Pyrenees. How to manage type 1 diabetes during an endurance challenge. *Diabetes Care for Children & Young People* **4**: 28–32

Article points

1. Endurance challenges should not be ruled out by people with type 1 diabetes.
2. Endurance training for a specific challenge should involve preparation for diabetes management.
3. Input from diabetes specialists before starting a strenuous physical challenge can be invaluable.

Key words

- Cycling
- Diabetes management
- Endurance challenge
- Sport

Authors

John Grumitt is Vice President of the International Diabetes Federation

Cycling more than 1000 km over six days, climbing several thousand metres through the Rhône-Alpes and the Pyrenees would be enough of a challenge for anybody, but what happens when you have to manage blood sugar levels and safeguard against hypos at the same time? This is a personal account of an endurance challenge taken on by someone with type 1 diabetes. It details the specific challenges of training while also managing diabetes and outlines the preparations made to take part in the mHealth Grand Tour challenge. With pointers and tips for other people with diabetes who are tempted by a physical challenge, the author concludes that it is all possible with the right frame of mind together with support and guidance from diabetes specialists.

When someone suggests taking on a big endurance challenge, my first reaction is usually a mixture of excitement, fear and – because I live with type 1 diabetes – a little bit of guilt. The excitement is generated by the potential satisfaction of success. The fear is of the unknown as well as feeling the task might be impossible, and the guilt? Well, that is for the anticipated demands it will place on those around me. So, when the idea of the mHealth Grand Tour – a bike ride from Brussels to Barcelona – came up, I grappled with all of these emotions and more besides.

What tackling adventures like this does demonstrate is that it is possible to achieve a great deal more than one imagines and the greatest limiting factor is in the mind. Having type 1 diabetes, of course, creates additional challenges but none of them insurmountable.

For any person with type 1 diabetes, endurance adventures need to be planned for with special attention to diabetes management. Care must be taken during training to observe and react to the way in which exercise affects blood glucose levels and how this can be managed by modifying insulin dosage and diet to fit in with the endurance task being undertaken to safeguard against hypos, not least during and after exercise. While there is general guidance available, experience has demonstrated that people with diabetes' bodies all behave slightly differently. The planning therefore needs to be tailored to the individual. Likewise, when young people's bodies are still developing, there may be further specific considerations to be taken into account. However with good planning and understanding, a great deal is possible. The following is an account of how I prepared and planned to stay healthy while cycling 200 km a day.

The idea of the Grand Tour was to complete a demanding endurance ride during which we could build awareness of the possibilities that technology offers diabetes management. The idea was born in collaboration with the Global Trade Association for the Mobile Phone Industry (GSMA) and the International Diabetes Federation. A study was

Cycling in the Rhône-Alpes on the mHealth Grand Tour.

conducted during the challenge where riders with diabetes and without had a continuous glucose monitor (CGM) fitted and the readings transmitted to a team at Newcastle University led by Professor Mike Trenell. The study investigated how multi-day endurance riding affects blood glucose levels during the day and during rest, and how different athletes manage their diabetes with insulin and glucose. With a professional team of riders also taking part, it also compared the diabetes management approaches of elite and non-elite riders.

Alongside the riders a diabetes specialist nurse (DSN), a dietitian and a GP provided what proved to be invaluable support. The tour was split into four stages of three days each. Some riders completed the entire 2100 km and 23 000 m climb, others just did part of the tour. Family commitments meant that I could just about get away with taking a week off so I joined the riders for stages three and four, meeting up in Annecy for the ride across the Rhône-Alpes, the Ardeche and over the Pyrenees into Barcelona.

Having decided that cycling an average of 200 km a day and climbing several thousand metres over that distance, day after day for a week was going to be fun, I had to start working out how it was going to be done. The first thing that came to mind was something that James Cracknell, the double Olympic gold medallist and adventurer, had said to me a few years ago at the start of the first Ride Across Britain from Scotland to Cornwall. As the rain lashed down on our tent at John O'Groats he told us to forget anything about the following day or the overall challenge until you are nearing the very end. You have to give your mind a chance to cope with the immediate challenge at hand to avoid being overwhelmed, particularly when you experience inevitable tiredness. I applied this approach to everything from the very start and divided my training into small chunks, each with a clear goal. Each session in the gym and each ride was plotted. By tracking progress against these you can gain an idea of how you are progressing. It also helps you to enjoy the successes you have on the way and maintain your motivation.

The training takes time and inevitably intrudes on those around you. It is important to carefully identify all your other commitments, map them out in a diary and fit your training around them so as to keep the support of your loved ones. Even if the weather is a bit grim and you are finding it tough, you still have to train. If you have to get up

"Having decided that cycling an average of 200 km a day and climbing several thousand metres over that distance, day after day for a week was going to be fun, I had to start working out how it was going to be done."

at 5.30 a.m., then so be it. Equally, it is important to build in periods of recovery, but any decent coach will help you plan that in too.

I was lucky to have a personal trainer, Terry, who became my trusted companion, making the training as effective as possible. Twenty press-ups done well will have greater impact than 100 shoddy ones belted out at speed. A lunge with a narrow step or a bent back is far less effective. Less proved to be worth more.

Having put together an exercise programme I then had to work out a dietary plan. Training for up to 12 hours a week requires a well-fuelled body as well as one that recovers well from fatigue after a hard session. The diet, unsurprisingly, was made up of a well-balanced breakfast, lunch and dinner, healthy snacks and protein to maintain and build muscles, as well as fat and carbohydrate to provide fuel.

When I embarked on my first endurance challenge I was fortunate to meet Dr Ian Gallen, a diabetes specialist with an interest in sports. At my first appointment with him he told me that he had recently supported a young woman with type 1 diabetes to swim the English Channel. You can find out more about Ian and his team at www.runsweet.com. Their help was priceless. First of all, dietitian Carin Hume filled in the considerable gaps in my knowledge on how to maintain the fuel intake I needed in both training and when I was on the Tour. Together with the clinicians, we established a plan. I needed to have a big breakfast about two hours before I started a long day's ride. My glucose tends to rise quite substantially after eating before falling back to normal levels. I had also worked out that my performance deteriorates dramatically when my blood sugar levels are above 12 mmol/L: found generate far less power and am prone to get cramp. My bolus insulin was reduced to only 20% of a normal dose at breakfast. Once the Tour was under way, the fuel and insulin intake varied depending on the terrain. Of course, everyone is different and the levels need to be worked out with a specialist. In my case, I reduced my background basal to almost zero. This meant I often needed to bolus when snacking on the ride or when I stopped for lunch.

Taking a break to admire the views.

In the evening, after each day's ride, I found my blood glucose rose steeply. Keeping track of this and correcting appropriately was a challenge, but an important one to get right.

Having developed hypo unawareness a few years ago, I have become used to using a CGM system so that I can know my blood glucose level at any time and also monitor the trend. This has allowed me to manage where the levels are heading, rather than just responding to highs or lows.

The climbs on the ride were tough. It was essential to be well prepared. The weather at 1000 m above the start of a climb can be quite different and far less predictable. It can also get very cold on a descent. On a climb you need to settle into a steady pace, with occasional bursts when the gradient gets steeper. Typically one needs about 500 mL of water per hour; more if it is hot or you are sweating profusely. Maintaining balanced glucose is one thing, but you also need to maintain electrolytes. I managed this by putting a sugar-free electrolyte tablet into one of my water bottles and putting a diluted sports drink in the other. The golden rule with fluids is to maintain a steady intake, having little often. Carin, herself an endurance athlete, warned me that if I ever felt thirsty I was already dehydrated and at risk of "bonking" or "hitting the wall" (like the struggling runners in the final few miles of a marathon as they are hit by sudden fatigue caused by depletion of glycogen stores in the liver and muscles).

On average, I targeted an intake of 60 g of carbohydrate for each hour. The actual amount

depends on your weight and required output. Like the fluids, the essential element of this regimen was sustaining it, hour after hour. Many of the sports drinks have additional minerals in them. I found that these were needed to replace what was lost in perspiration and to avoid cramp.

Maintaining a steady carbohydrate intake is not only essential to keep the body fuelled, it also keeps the blood glucose levels in target range. An additional hurdle for me, and I expect many others, is that after a meal my readings rise quite substantially before falling again. I have tried various methods to combat this without success. To avoid having elevated blood glucose I would get up early and eat breakfast a couple of hours before setting off to allow time for it to fall back to normal again. Starting with a normal reading reduced the fluctuations and the risk of a hypo. On multi-day adventures such as the mHealth Grand Tour, I set my alarm for 3 a.m. to check my blood glucose and, if necessary, take a corrective dose. Having a hypo, or just going low when out on a long ride can take up to three times the amount of corrective carbohydrate than would be the case if not exercising. I found in training that the required intake to correct these dips was quite extraordinary – all the more reason to be prepared and carry plenty of energy gels on the bike.

Another consideration for multi-day events is the legacy impact whereby insulin requirements are actually lower for a day after a long ride. Riding 200 km a day and sometimes climbing around 4000 m had a cumulative impact not only on my legs but on my insulin regimen too. Dr Gallen's team helped me work out the calculations. Being on a pump made it easier as there was no long-acting insulin to factor in. The background doses were a fraction of what they are when not pedalling for most of the day.

We were joined on the trip by a professional team founded in the USA by Phil Southerland. Originally called Team Type One, with generous sponsorship they became Team Novo Nordisk. As pros they were using the ride as a training exercise. They were kind enough to invite me to join their peloton for a day. Each of them was in great shape, technically proficient and apparently pretty good at managing their type 1 diabetes. Thankfully I was able to sit in the middle while the guys at the front did the hard work. As well as being highly efficient cyclists, what struck me was how they grazed, eating small amounts of food almost continuously. They were far more disciplined than me too. I learnt a lot from them.

"Is it all worth it? Of course it is!"

Riding the big climbs – and there were plenty of them – was a task requiring careful planning and execution. First of all, it was necessary to be in good shape on the approach. This meant being well fed and watered with blood glucose in range. It would not be good to need to take a corrective dose just before an intense hour of climbing as managing your blood glucose in such an environment is tough, potentially distracting and risky. On the climb itself, it is important to establish a steady sustainable rate and hold onto that routine. In the Rhône-Alpes the weather deteriorated requiring us to put on more clothes as the temperature dropped and the rain poured. The body demands more energy to keep warm as it gets colder, needing more carbohydrate and less insulin. In contrast, we crossed the Pyrenees in glorious warm late summer sunshine, which meant focusing more on fluid intake. Although the effort was great and the scenery breathtaking, I had to force myself to concentrate so I didn't fail to take on water or fuel to sustain the effort. Also, when working hard, the insulin requirement became negligible.

At the summit of most climbs there were refreshment stations to top up water bottles, gather more food, enjoy the scenery if the cloud cover allowed and give yourself a pat on the back. A

"When pushing yourself, you need to keep life as simple as possible. Diabetes undoubtedly presents additional challenges, but these challenges can be overcome by responding to your body's needs."

steep descent usually followed during which little energy was burned. As a result, additional care was required to take a shot of insulin with the food intake at the summit. I learnt this the hard way on a previous Alpine adventure, La Marmotte, when, having reached the top of the infamous Galibier mountain pass with a blood glucose reading of 6.2 mmol/L, I decided not to take a shot and found that 45 minutes later after the descent my levels had risen to 22.6 mmol/L. Needless to say, cycling down a mountain road with elevated blood glucose is not good for the concentration and is best avoided.

On the last day we set off from Berga over the final and relatively short climb into Barcelona, via the Tibidabo mountain overlooking the city itself, and ended the ride at the City Hall. By this time, everyone was suffering from achy and tired limbs. The sun shone brightly as we were treated to an enthusiastic welcome from dignitaries and PR people and we were rewarded with a champagne reception from the mayor. The thing about long trips is that you spend so long getting there, and relatively little time thinking about the destination itself, that finally reaching the end seems to happen very quickly. Completing challenges is more about mental attitude than physicality. You can be as fit as you like, but it is determination that gets you through. And that applies to managing diabetes too. When pushing yourself, you need to keep life as simple as possible. Diabetes undoubtedly presents additional challenges, but these challenges can be overcome by responding to your body's needs.

Ian Gallen's www.runsweet.com site is a very good place to start when preparing for an endurance challenge. The forum offers personal accounts of a wide variety of challenges taken by people with diabetes. While I live with diabetes and it is up to me to manage it, I have found sports diabetes clinical teams to be valuable. If ever there is an example of managing diabetes around a goal, this has to be it. The expertise offered by the diabetologists in the planning prepared me for the challenge. The DSN and dietitian helped me with the finer details and I owe a great deal to their support.

Doing such adventures is essentially pretty selfish. Those closest to us, our family and friends, put up with a great deal and the training takes up a lot of time. However, I felt such a sense of achievement at the end of the challenge and if I am asked whether all the training is worth it, I would reply, "Of course it is!" This summer I am completing the Trondheim to Oslo sportive (560 km over a June weekend, without sleep!), as well as looking forward to the 3rd mHealth Grand Tour in September (www.mhealthtour.com). Come and join the fun! ■