

INTERVIEW:

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For the uninitiated, could you give the quick and dirty rundown of your back story? What areas in the fitness industry do you specialize in and what drew you to these topics?

It all goes back to an early Monday morning school run in 2009. I was happily perked up at the back of the bus watching the world go by. As humans, we are pretty good at recognizing patterns. I was very familiar with the route and everything we would pass along the way including the friendly lollipop man that would always wave, the long stretch of motorway, and all the other vehicles commuting at the same time.

However, one day I noticed something was off. It was my eyesight. It was incredibly blurry. Reading car number plates and advertisement billboards was a challenge. I always prided myself on having 20/20 vision. The harder I tried to focus, the more evident it became my eyesight was failing. I shook it off and labeled it as lack of sleep. As the weeks went on, my sight got progressively worse. I also developed an undying level of thirst that could never be quenched no matter what or how much I drank. I was literally skiving my school lessons based on the number of toilet trips I would have in a day. Standard parent protocol had me booked in to see my GP the next day.

The blurry vision and frequent toilet trips were complications of hyperglycemia. You've probably already guessed it. I was diagnosed with Type 1 diabetes. As of the 16th June 2009, I would be taking injectable insulin for the rest of my life and could be at risk of dying prematurely.

Notice that word... 'could.'

After speaking to the doctor, I quickly realized nothing he said was definitive.

I had loads of questions about the complications of diabetes, but all his answers contained the same words such as 'might, maybe, may, possibly.'

While most people would freak out with the thought of limb amputation, blindness, and reduced life expectancy. His tonality and choice of words gave me hope.

Whether this was a clinical communication technique or not, I realized diabetes was my responsibility. Provided I controlled it, there was no reason it would ruin my life. I was going to control it.

So, I set out to learn all I could about my condition and this new way of life...

I accepted medication was a non-negotiable aspect of controlling my diabetes. With two injection pens, a fast acting bolus insulin to cover my meals and a slower acting basal insulin to control the natural release of glucose from my liver in response to daily physical activity and stress, I was now officially in manual control of my pancreas.

I was intrigued to know what was wrong with my body and how I could anticipate and respond to problems. Diet, exercise, and lifestyle were the next steps. Since I could control these, I placed a very high value on each of them. I became engrossed in learning all I could about each. The more I knew, the better I was able to control my condition and, subsequently, the safer I felt.

After finishing school, I took up weightlifting and went on to study Clinical Nutrition at Queen's University Belfast for 6 years. I graduated and ended up working as a nutritionist for the National Health Service.

My love for strength training grew, which led me into competitive bodybuilding. I ended up competing all over the world winning many shows, getting a major sponsorship deal and appeared frequently in a number of mainstream fitness magazines. This kind of fitness achievement was relatively unheard of for someone living with type 1 diabetes due to the complex nature of reaching single digit body fat whilst maintaining very high training volumes.

I pursued my education in nutritional science even further and also set up a side business for personal training. The demand for my coaching exploded and

I eventually left the health service to be a full-time self-employed nutritionist and personal trainer who specialized in body composition.

As time went on I became known for my work. I started public speaking and writing for many of the mainstream fitness magazines.

Nowadays I give back and educate 1,000s of personal trainers every single year with my seminars and workshops. I also published my first book, [The Diabetic Muscle and Fitness Guide](#), in October 2016 which has helped improve the lives of many people around the world. I am currently in the process of building an associated Diabetes Evidence-Based health and fitness membership site aimed at empowering and connect fitness enthusiasts with diabetes all over the world.

For the professionals out there who may not have worked with a person with type 1 diabetes (T1D) before, what are the top tips they should understand before engaging with athletes with T1D?

Today's fitness and health professionals work with more people living with diabetes (especially type 2 diabetes) than ever before. This presents a major challenge, particularly within the personal training industry which is growing rapidly, and is normally the first line of contact for many people with diabetes looking to improve their health.

It's imperative to know what diabetes is and the fundamentals of diet, exercise, lifestyle, and medication management.

Here are five important points a healthcare or fitness professional should understand before engaging with T1D individuals involved in sport or fitness.

1. High-intensity exercise like weight training can increase blood glucose levels, even without the consumption of carbohydrates. This is a result of

counter-regulatory stress hormones that increase in circulation as a result of high-intensity exercise. It is imperative that such increases in blood glucose are anticipated and dealt with.

2. Low-intensity exercise like cardio has the potential to lower blood glucose and cause hypoglycemia.
3. The psychological aspect of managing diabetes is undervalued and not talked about enough. If T1D athletes and fitness enthusiasts were to place a higher value on their diabetes management, they would excel in their fitness or sporting efforts. Poorly managed diabetes will have a highly detrimental effect on muscle building, fat loss, and sporting performance.
4. Whey protein and supplements like caffeine have the potential to increase blood glucose levels and may require insulin.
5. People with diabetes are more susceptible to podiatry problems, which can have implications for exercise program design.

When you started to get into lifting, there was little information for type 1 diabetic athletes, or even for those who wanted to exercise recreationally. Over your career, where have you seen the biggest improvements in the knowledge base of coaches/trainers in this area and which areas do you think still need to be improved upon?

When I first started training there was next to no decent information on diabetes and fitness online. There was some generic stuff, but it was very limited and didn't

give any actionable advice. Clinical texts did exist, but they often cost £100+, and were too hard to interpret. Twelve years on, I've read pretty much every clinical text around diabetes, exercise and nutrition. The bulk of research focuses on overweight individuals with type 2 who don't exercise. The research on exercising type 1 individuals is scarce and needs much more attention.

Although exercise has long been considered a cornerstone of diabetes management, many people living with the condition don't have adequate knowledge or experience of training to get the most out of it. You have to ask why?

Proper advice on diabetes and getting in shape requires multiple skill sets and professionals in the following:

- Nutrition
- Exercise Physiology
- Diabetes Specialist
- Psychology
- Pharmacy

There is very little information available that looks at all of these elements as a whole and amalgamates them into one evidence-based resource to help the layman with diabetes and modern day fitness professional make better decisions.

That is the exact reason I wrote my book [The Diabetic Muscle and Fitness Guide](#).

“ Poorly managed diabetes will have a highly detrimental effect on muscle building, fat loss, and sporting performance.”

There's a perception that T1D athletes may gain a competitive advantage by manipulating their insulin dosages to "artificially" increase muscle gains. Is there any truth to this?

No there is not.

Injectable insulin is needed to regulate blood glucose levels in people living with type 1 diabetes and severe cases of type 2 where insulin secretion is nonexistent.

When insulin isn't produced by the body, carbohydrate (notably glucose) eaten from the diet or produced by the liver cannot leave the bloodstream and enter muscle cells for use or storage as muscle glycogen. This results in **hyperglycemia** (high blood glucose) which has widespread catabolic (destructive) effects across the body including loss of muscle mass.

There is a common belief among bodybuilders (in general) that injecting insulin post training and consuming a mix of amino acids, creatine, and carbohydrate (in liquid form) will increase muscle gains and strength.

Is there any truth to this?

Apparently not. See [Tommelen et al](#), and his research in the European Journal of Endocrinology. They reported exogenous insulin administered systemically does not increase muscle protein synthesis in healthy, young adults.

Injecting insulin will facilitate and intensify the transfer of nutrients and water into muscle cells. While this may cause a temporary increase in muscle cell size and also help generate that much sought after muscle pump. It appears to do very little for muscle growth.

In people with type 1 or severe cases of type 2 diabetes, injectable insulin is needed to controlled blood glucose. Without it, muscle wastage and unhealthy derangements in whole body metabolism arise.

Although life changing, the use of injectable insulin can also bring negative side effects. The most common side effect is **hypoglycemia** (low blood glucose), which although annoying, can be treated. Problems arise when hypoglycemic events recur and the individual is forced to eat more food to restore their blood glucose. This can increase calorie intake and the chances of gaining fat.

Insulin is probably most well known as the hormone that helps shuttle glucose into your cells. But there is also an interaction between dietary protein and insulin. Does eating protein alone without an insulin bolus make the protein less effective at stimulating muscle growth?

Insulin is considered an anabolic (constructive) hormone. When protein is consumed, the beta-cells of the pancreas secrete insulin to shuttle amino acids into cells for anabolism. Insulin has been shown to play a role in the creation of new proteins across the body as well as [inhibiting muscle protein breakdown](#).

All the amino acids that make up protein impact insulin secretion differently. Certain amino acids are more potent at stimulating insulin secretion than others, [especially leucine](#). This explains why [whey protein](#), one of the richest sources of [leucine](#), increases insulin secretion more than [any other protein source](#). And, why the food insulin index considers the [insulin requirement for foods as a whole](#) (including protein and fat) rather than just their carbohydrate content.

The synergistic combo of glucose and amino acids signifies a high energy state (compared to one macro nutrient alone), leading to elevated insulin secretion. This is what promotes anabolism, glycogen storage, and synthesis of fat tissue (if excess energy is available). Eating protein alone would not yield as much of an insulinogenic or anabolic response compared to a matched meal of protein and carbs. Besides focusing on carbs and protein alone, it's important to see the bigger picture and consider all the other important factors

that influence rate of muscle growth including, but not limited to:

- Overall diabetes management
- Overall calorie intake
- Body composition
- Stress
- Sleep
- Training frequency
- Progressive overload
- Use of ergogenic aids (performance-enhancing drug, supplements like [creatine](#), etc...)
- Other diseases and illness

Should type 1 diabetics pair carbs with protein to maximize proteins anabolic effect?

The most popular approach to mealtime insulin dosing is counting carbohydrate and applying an insulin to carbohydrates ratio. Most people with type 1 diabetes believe they are only giving insulin for the carbohydrate. However, the insulin dose calculated from the insulin:carbohydrate ratio actually takes into account the insulin requirement for usual protein portions. Carbs and protein are rarely consumed in isolation. It is much more likely that [both macronutrients will accompany each other at meal times](#).

Provided essential amino acid needs are met across the day. The primary responsibility for someone living with type 1 diabetes is to dose enough exogenous insulin to accommodate any increase in blood glucose. ♦

Phil Graham BSc, PGDip, CISSN, MSc(c) is a type 1 diabetic, sports nutritionist, strength coach, and author of the world's best-selling diabetes fitness book - [The Diabetic Muscle and Fitness Guide](#). You can find out more about Phil's work at his [personal website](#) or on [Instagram](#). Also be sure to check out his [Diabetic Muscle & Fitness](#) site and its related [Instagram account](#).

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