4 - Mastering CamAPS FX – The Batman of AID Systems

John Pemberton (00:09.944)

Welcome to the Glucose Never Lies podcast where science meets real life experience to empower diabetes management. I'm John Pemberton. I've lived with type 1 diabetes since 2008 and have spent nearly 20 years mastering both the science and art of managing it. Through personal experimentation, published research and my work as a diabetes specialist dietician, I've gained deep insights into what truly makes a difference. When my son Jude tested positive for type 1 diabetes antibodies,

I realised that all the knowledge in my head was wasted if I couldn't communicate it in a way that was clear, actionable and easy to come back to. So I built the Glucose Nebuliser Education Programme, a free online resource designed to teach people diabetes management exactly the way I'd want people to understand it if they were looking after my son. After battling a functional motor disorder for many years and recently experiencing a major depressive episode, I was eventually pulled out of that hole by my friends, family and professionals who helped me get back to being me.

That experience taught me the power of giving and this podcast is my way of giving back. My co-host Louise is a highly experienced diabetes nurse with over 20 years in the field. She brings a wealth of knowledge and her superpower is making complex diabetes science accessible and practical for everyday life. She is the best diabetes nurse I have ever worked with and there have been some good ones. Most importantly, she keeps me in check and keeps the podcast on point. So if you're living with diabetes or supporting someone who is,

We want to make things easier, clearer, and importantly, more enjoyable. We hope you enjoy the content. If you do, please share it with those who may like it too. As a disclaimer, the information shared on the Glucose Nebulize podcast is for informational and educational purposes only. While we discuss strategies and insights for diabetes management, this podcast is not a substitute for professional medical advice. Always consult your healthcare team before making any changes to your diabetes plan.

That done with, let's get into the content.

John Pemberton (02:13.486)

of a Live Podcast, episode four. And this is all about the Cambridge system, the CAM APS FX, what we call Batman, the one that's got lots of tools, but you need to know how to use them to get the most effective use and the most effective timing range. So just as a little bit of a recap, on the first episode, we introduced automated incident delivery systems. And then we talked about Control IQ, the 780G, and this is the time of the Cambridge system. So again,

From a kind of simplistic point of view, from Batman, he's got a lot of tools, a lot of different options, a lot of toys, but you need to be able to use those to their full effect to get the most time in range. And we're going to really work through what the Cambridge system is all about. And then again, hopefully some ideas, some tips and tricks to how you can adjust this system to get the most out of it.

So again, this is probably more of Louise's expertise than mine. So I'll be certainly passing, handing over the baton to discuss the tips and tricks, especially for the younger children that Louise has got lot of experience of putting them on and even diluted insulin, which again can be useful. So just a bit as an overview of the components, do you want to go through the components? Yeah, that's absolutely fine. A caveat.

As regards my experience with that, guess this was the system, the only system that was licensed for the particularly young age group that we had have a lot of under fives. So we use this system with our youngest population as being the AID system for them, because I guess it was the only one that we could use at the time. So, and I guess I sort of led that.

part of our service tentatively with the support of the Cambridge sort of team as well. So I guess the component part is we've got the pump and so these are both simple pumps. you've either got the Darner pump or or more latterly the Ipsa pump. When I say simple pumps, they are pumps that are designed to be used with an algorithm with the Cambridge app.

John Pemberton (04:21.3)

So more latterly, we've used the Ipsa pump by choice, just things such as being able to put a preloaded cartridge into the pump has been sort of life-changing for us as professionals to teach how to draw up insulin and things using the Darna pump. And then we've obviously got the Dexcom G6 sensor. It's licensed to be used with the Libra 3 as well.

but you also need an Android smartphone. It can't be an Apple phone. So it needs to be an Android phone that's compatible with the Dexcom G6 or the Libre 3. And the algorithm is sort of downloaded onto that phone. So that's the Cambridge CAMS APSFX.

So that needs to be downloaded onto that phone. So those are some of the teething, potential teething problems that you might have in the initial period, just making sure that you've got the right kit and everything works together really. Yeah, so I mean, I can pop in there. mean, some of the things that I found.

really nice about this system is you can have a target level as low as 4.4 as high as 11, which really does give you the greatest range of options depending on who's in front of you. If you've

got someone really wants really tight control, pregnancy or people who are used to running 70, 80, 90 % timing range, you can target that down at 4.4. If you've got people potentially got retinopathy or real fear of hypoglycemia, you can set that target level much, much higher. And you can have up to

48 different target levels across the day. Not that anyone's going to have 48 different target levels, but you might want three or four. Certainly an overnight tight, bit more relaxed during the day, and again, a little bit more tighter in the night. So I think that that adjustable personal glucose target is something that really stands out for the Cambridge system, certainly. And I think that comes into play massively with the particularly young age group. So you...

John Pemberton (06:33.44)

sometimes want to have that personal glucose target, sometimes a little bit lower than what you would expect to try and keep the algorithm working because what you can see sometimes on downloads is the algorithm shutting off and then the glucose level goes really, really high. So it's about sort of using the tools that you can to adjust to try and keep the algorithm, keep that timing range as optimized as possible. And that's one of the things that we sort of

looked at in quite a lot of depth with some of our really young patients. Yeah, and I think also it being the most sophisticated, I used to say complicated, I guess get told off all the time. I think that's fair enough. The most sophisticated and when you look at sort of the research and interesting fact for all the nerds out there, FX stands for Florence and that's the particular algorithm that was researched by Roman Havorka. There was several different

different names to different ones, but Florence is the one that flew. So yeah, anyway, they're talking. knew that. Nerd, nerdy stuff going on there. Going to too many conferences that. But again, you've got so many inputs going in and it models four hours into the future in terms of thinking about its adjustments that it's going to make. So again, it takes a lot of inputs within there and in terms of sort of more of an AI based algorithm rather than some of the more simplistic ones. But again, that comes to

you're going to get the full use out of it making sure your carbohydrate entries are fairly accurate and again using some of the additional features which we're going to discuss now which really gives it the use of the opportunity to maximize time and range the different options he's got so if you want to talk through like ease off boost and move so there's I mean from a simplistic point of view we can think about using ease off so you would use ease off for things like exercise or if

there was insulin on board and you were going to undertake exercise immediately after that meal or if you were concerned that the sense of glucose level was dipping sort of on the lower side but you set it on and then it will automatically switch off if it senses that the glucose level is

actually going too high. So it almost that need for you to take that initiative is taken away. So I guess that's something to consider.

John Pemberton (08:55.052)

And then we can use boost as a form of maybe bringing the glucose levels down. Again, that will switch off automatically. They talk about it sort of adding 33 % aggression or reducing by around 33%. But there's no, I guess it's because it's based on all these different scenarios that there's not necessarily a numerical value on that.

And then obviously things like adding in hypo treatment. So to the gram, it's really important. Adding snacks in, so announcing small snacks into the algorithm. We tend to use a guide around 10 grams. So if it's anything sort of more than that, then you'd probably want to do a bonus for. But if you announce the algorithm that you've added a small snack in there, the algorithm knows that that is a snack that it might want to potentially.

increase the tiny micro boluses that are going in the background and that's important that the the basal is tiny micro boluses that are going in there and then you've got your slowly absorbed meals so that might be whereby you can use it to manage a high fat high protein meal but also some of our younger patients parents and families have used that for things for different meals so it announces the algorithm that

that there's that sort of 30 grams that they want to go in more slowly, but it will only sort of offer insulin if required sort of thing. So it's got quite a lot of safety mechanisms, I guess, which is where it might fit into that younger age group and obviously pregnancy as well. Yeah, I think one thing to say from a healthcare professional point of view is when you're checking out the download, it can look really weird.

because you see these little micro carb amounts going in and things where you think, oh my God, why are they putting in all these carbs? But if they put in things like slowly absorbed meal, it's just letting some of that insulin go that you've kind of programmed in. And again, for people who are really picky and slow eaters, slow, so merely, you know, finish the meal for like half an hour, 40 minutes. That can be quite useful again to have that feature where you're slowing the, the, it's only going to give insulin when the glucose level starts to rise.

John Pemberton (11:11.394)

So again, that can be quite helpful in all those scenarios. But again, on the sort of downside of that, number one, you need the phone to be with you. So it has to be an Android phone. So if you're an iPhone, die hard at the moment, that's a bit of a challenge, but I'm sure that will change. But the fact that the algorithm runs from the phone means the phone needs to stay within kind of like two meters of you or so.

which again for most times is absolutely fine but there may be times where you want to run over and play football and do those things that again you're not going to have the algorithm working and doing all that fancy stuff for you. I they talk about it being like the Dexcom so within the six meters being in the same room I guess but that is something to consider when you're thinking about a small child or in a nursery room that those sorts of things although it hasn't caused any problems to date.

That is something that absolutely needs to be sort of discussed and, you know, with the sort of carers or school and things. Yeah, so I guess some of the top tips from the optimising that come from from ourselves are really the only things that you can adjust to drive the algorithm of the carb ratios and the personal glucose target. So the personal glucose target is the thing that you will use. And because you've got such a wide range of this times a day where you want the algorithm to be more aggressive because people are insulin resistant, you just get that.

personal glucose target down really tight, really low. And it's times of the days where it's hypos or a problem, you increase it. So I think we mentioned on a previous podcast, the under fives generally tend to have this wicked insulin resistance between like 7 PM and midnight. We just get the glucose target down really low to like five or 4.5. And then from midnight, you bop it up again to sort of eight or nine to manage the drop. So that really maximizing the use of that personal glucose target means you can

really manage someone's insulin sensitivity and support them so they don't run into high and lows? Yeah, and I guess, you know, it's really easy to see what the algorithm is doing from the phone as well, just by flipping out on its side, seeing the graph, can see. So like the service user can see all the time, sort of what's going on and what would be seen on a download, which is again, I know that features on some of the other systems, but I think it's quite easy to recognize what's going on.

John Pemberton (13:24.45)

So hopefully that gives you a bit of an overview of the Cambridge system, what the components are, the sophistication of the algorithm, the options that you've got as a user to optimize the daily management. And obviously some of the challenges that come with that, you have to be actively engaged to get the most out of it as well. So just bear that in mind. So hopefully that's been helpful. And again, in a future session.

we will go through the top 10 tips to optimize timing range, regardless of which system that you're on. So hopefully that'll be helpful to give you some further tips. But in the next session, we're going to focus on the Omnipod 5 system with smart adjust and go through the same sort of ideas of components, pros and cons, how to get the most out of system. So we will see you in the next session.