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 Nevelise 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 (02:14.038)

podcast episode six, and this one is the top 10 tips to optimize timing range when using a AID system. Personally, this is one I've been looking forward to the most. I enjoy talking about the systems, but really this is where the kind of rubber meets the road. It doesn't matter what system you use, all of these tips will be useful in terms of getting you from 50 % timing range, which you'll get for doing very little, pushing all the way up to 90 % timing range, maybe more depending on how many of these you.

want to do and find possible to do. So these are kind of like options tools for your tool belt. You don't have to use them all. Just use, pick out the ones that really seem to you and just ignore the other ones that don't. Absolutely. And I think, I think since we've had so many children, young people go on the systems, we've really wanted to think, well, okay, we're here, we've got them on. What can we do to make their control even better? And like, like we say, give them the tools in the toolbox and they can,

So in an ideal world, the sort of standard is to try and get 70 % time in range between 4 10 millimoles per litre without getting more than 4 % hypoglycemia or time below range less than sort of 4. So that's the kind of balance, isn't it? You're walking a thin line between trying to push as much time in range as possible without it causing too much hypoglycemia and at the same time without it being too annoying because you really want these systems to

make your life easier, not make them harder. And that's one thing I would say about continuous glucose monitors without these systems is they give the user the option to go wild and get all the time you mean to they want, but they have to work extremely hard to make that happen. Whereas these systems reverse that round. There's not many things in life you get more for doing less. This is kind of one of them. So we don't want to pretend that these things were saying you have to do them all, but

sometimes these things can just really help optimise your timing range, which is basically the health in the future as well. Absolutely. There's just principles maybe that can be applied as and when. And most of these, you weren't using an automated insulin delivery system, are going to be completely applicable. And if you don't have diabetes, the vast majority of these things that we're going to go through will be ideal for your health. So something we're big on when we speak to the families who we support is what's good for the person with diabetes is

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undoubtedly good for the person without apart from the fact is they don't see it in a continuous glucose monitor whereas the person with diabetes does. So it shouldn't be that the person with diabetes is being singled out. It's just being their continuous glucose monitor almost be like a proxy for what's happening the rest of the family's body. They just don't get to see it. So the first one was that with top one top tip is balanced meals. So within the show notes we put a little infographic which really

My work as a dietitian I use all the time explains the difference between high carb meals that are low in fat, balanced meals and high fat meals with carbohydrate. The simple bean thing being, if you're on a high carb meal with low fat, the glucose absorption and entry into the bloodstream is a lot faster than how the insulin works, takes, insulin takes about two hours to peak, four hours to work. In that scenario, a high carb, low fat meal is in within 60 minutes and done in two hours. So you get a spike regardless.

being an automated insulin delivery system is not going to change anything because you've given that insulin as the user front up, you're still going to go high in this scenario. And the common one is breakfast cereal is probably the worst. Yeah, absolutely. Breakfast cereals. And I suppose just going back a step, these are principles that you might want to discuss with your families before they even go on an AID system. So, or if, you know, even when you, if you're on multiple daily injections, it's about sort of

these principles being applied from the start, like John says, for our families, for us in our day-to-day lives. know, breakfast cereals are the bane of dietitians' lives and you can see why with the infographic. Yeah. And I guess probably there's two things you can do here. Well, the one is people are not going to change. So, and absolutely it's a personal choice. If they're always going to have the cocoa pops, then absolutely fine.

The way you can manage it is you can throw some activity in after those cocoa pops and actually see that insulin that's in there getting supercharged and get on top of those post meal highs. So the standard one that I will see in clinic is a person who has cocoa pops on a weekday, there's no glucose spike after eating. Well, that's because they walk 15 to 20 minutes to school. But on the weekend, when they're gaming, their glucose level goes through the roof and you can really see the value of being active after eating even for those high carb meals. So I guess it's just thinking about if

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going to have those things, what's the compensation you can do to manage that? And in this scenario it's putting the activity in after eating. Would you ever add protein in before? Yeah so I guess then that takes it on to how do you make a high carb meal into a low fat meal into a balanced meal? Well a balanced meal generally has a carb, a protein, ideally a vegetable.

But maybe that might not be possible at breakfast. I don't know too many people who have broth with their cereal. But obviously you can change to toast with egg, which will make a huge difference in terms of the after meal spike. So if it's all carbs, you're only really left with activity to solve the problem. But if people are willing to have more of a balanced meal by including some protein, i.e. egg on toast or some high protein yogurt type situation, then what you can actually do is slow down the absorption of that glucose.

and make it so that the glucose going in is more like peaks after two hours and lasts four hours. So having more of a balance. And obviously when you get to the evening meals, the more vegetables you have in there and the more fiber you have in there, it slows that glucose absorption down. So balanced meals as often as possible, a carb, a protein, a vegetable, if possible. And then I guess then the final one, which will come to me in one of our other rules is what do you do with these high fat meals?

and that have got some carbs in your pizzas, your fish and chips. Yeah. Lasagna is another one where the instant often works too fast. Someone goes low and then all the carbs get digested along with the instant resistance afterwards and the glucose level shoots up after. But we'll save how are you going to manage that for when we talk about high fat meals. But the simple thing for this is if it's a high carb meal and they're not going to add some, make it more balanced.

then the only option is to put some activity in for 15 to 20 minutes after, i.e. walking to school. Or if they're willing to make it more balanced, get a protein source in there, get a vegetable source in there, and then you will find that the post meal highs are tackled by dietary changes rather than the system needing to compensate. So you wouldn't, just to clarify, if they walk to school...

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they wouldn't be put in activity mode on their pump, they? Because that'd be counterintuitive. Yeah, no, that's a point. I mean, you can get away with sort of 15, 15, 20 minutes of activity just at walking pace without requiring to do any adjustments, especially in the presence of a breakfast cereal for sure. The second one is pre-boilers in, ideally giving the insulin 15 to 20 minutes before a meal can really help.

get on top of those post-meal highs. So it's important probably just to take a bit of a physiology check on this because this helps explain a lot of things that happens with diabetes, is nothing short of a pain in the backside, but is just the reality. So a person without diabetes, their pancreas is sat right above their portal vein. And the portal vein is the bit that connects the intestine to the liver.

and it's the bit where the food gets, specifically carbohydrate, gets digested, it goes into the portal vein, then into the liver, and on its way to there, the pancreas dumps the insulin into the portal vein, which means the vast majority of the glucose that you eat is first of all stored in the liver before it has a chance to get out into the circulation. So that's why people without diabetes generally don't get high glucose levels after eating because the vast majority of that is captured within the liver. Now, if you think a person with type 1 diabetes

They do not have or very little insulin produced from the pancreas, which basically means when they eat and they put their insulin into the subcutaneous fat tissue, the insulin is around in the outside of the body and it's not in the portal vein. So everything that you eat, it goes into the portal vein, bypasses it well, goes through the liver without being captured and stored in there and out into the bloodstream. So even with the right insulin dosing for the food, you're still going to get an after meal spike because you don't have the insulin where you really need it, which is in the portal vein.

that make sense? Absolutely. Cool. So that speaks to you can't just give the insulin at the time of eating, you need to give it a head start in general of 15 to 20 minutes. And if you give that insulin a 15 to 20 minute head start, it gives some of it a chance to get into the portal vein, but it also gets it ready in the blood as soon as that glucose comes washing out through the liver and to get it captured within there. So giving that insulin 15 to 20 minutes. But I'm sure you've got some questions around when's that a good idea? When's it not? I guess.

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things that, know, from a user point of view, thinking about our younger age groups or people that have said, or, you know, we're trying to unpick people that might have gone onto an AI system, but have been on injections for a long time where this, just wouldn't do this if their glucose level was say 4.5 before a meal. If I give my insulin 15 minutes before I'm going to go low or how do I know if that child is going to eat it?

they're a little bit picky. Sometimes they like the beige food. Sometimes they like just the fruit. Sometimes they'll just eat the protein part of it. you know, what suggestions for, you know, real world examples would you be talking to these families about? That's best practice for people who you're confident about how much they're going to eat and they eat it all the time and they eat it in, you know, 15, 20 minutes. But I was thinking my son Jude.

There's no way in the world I'll be getting that instant in 15, 20 minutes before I'll look from, because once he gets the dinner table, that's his time. He just loves to get on the soapbox and chat and he can take up to 40 minutes to eat his food. So in that case, then you would probably think about giving a safe amount upfront and you might not even go 15 to 20 minutes up from, you give a safe amount upfront, number one, that you know they're going to eat and then you can make the rest up afterwards, which is useful with these systems because you can obviously put in multiple boluses of carbohydrate amounts. So

I think this is one way you truly have to have the glucose never lies. If you give your insulin upfront and you go low, it's too much, it's too soon. Go half and half, half upfront, half later on. If the glucose level stays in target, then that's the strategy for you. If you still go a bit too high after eating, then maybe put 60 % upfront. know, type one diabetes management is a full on trial and error game. And I think that's where the 15 to 20 minutes upfront is the gold standard.

for most of the time for most people, but certainly young children or if you're a slow eater or you have a type of meals which get absorbed slowly, that's not gonna work for you. So, you know, your team will tell you to probably give it 15, 20, was a front because that's best practice. your glucose levels tell you that's a really bad idea, you trust the glucose level. That's simple strategy. And, you know, sometimes it's about building up confidence, isn't it? So you might say, okay, well, let's try 10 minutes and then and see what happens. But obviously you

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15, 20 minutes is optimum and maybe demonstrating through the pictorial demonstration as to what's happening can help families and people and service users understand exactly why we're saying what we're doing because it's easy for us to say, but it's putting it into practice, isn't it? Yeah, and in the show notes we've put a little graphic of what we teach which is called SET, which basically means adjust the timing of the bolus based on where the glucose level and trend arrow is.

I'm not going to go into every single scenario, but you can imagine 15 to 20 minutes is ideal if you can have between four and eight and a steady arrow. But if you're say 12 with an arrow going up, you can get away with giving the insulin maybe half an hour before. So it has a chance to come down before it starts to go up again. So I won't go into that too much detail. You can check that out in the show notes. Definitely some of our families use this, definitely. And they've already noticed it by the time you start to talk to them about it as well.

So number three is managing high fat meals. I really like from Francesca Anand, lead dietician at UCLA. Her thing is find out before you fiddle. So what we do know is that high fat meals will cause insulin resistance and generally mean you need more insulin for that meal, but they will also slow down how quickly it leaves the belly. So you won't need it all up front. In theory, these systems should be able to manage that by not giving, if you give the insulin for the carbs, majority of it up front.

you won't go too low. And then when the glucose level starts to rise later, it will be able to get on top of it with the algorithm. So find out before you fiddle. Probably what I don't know what I've seen that works about half of people, but the other half of the people, the systems are just not strong enough yet to get on top. So you need to do something different. So that need to do something different is basically increase the amount of insulin that you're putting in and work out some way of spreading it out. And that will be system dependent.

So for the Tea Slim, we discuss this in the Tea Slim session. What you can start with, first of all, see if it happens, but they have the usual pizza and they go high and they go really high up to 13, 14, five hours afterwards. We need to do something different. Start by adding 25 % extra carbs in their eating into the bolus, split it half and half and extend it over two hours and see how that goes. If that still doesn't work, next time increase it by 50%. So as we said, if someone's having 100 gram pizza, you've dialed in 125.

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spread it over two hours. If that doesn't work next time, 150. If it doesn't work, 175. And just as an idea here from the research, on average for a big pizza like that, you'd need 65 % extra with some people needing up to 125 % extra. So 25 % is literally the bottom end and a safe range to

go from. And the thing for the TCM on that perspective is don't start the sleep mode too early because you'll end up with no auto corrections.

And then the other one that we looked at that we talked about that's got a specific thing is the Cambridge system where you can put the slowly absorbed meal in. So you would put a safe amount of carbs in upfront, maybe even up to 100 % of the carbs and then add some extra, the extra 25, 50 % in a slowly absorbed meal. So it will give the initial bolus upfront to capture the majority of the piece, let's say. But then if it starts to rise later on, that slowly absorbed meal function will start to kick in.

So again, that can be really useful from the Cambridge system and a nice little way to use some of those Batman tools. But then for the other two systems, the 780G and the Omnipod 5, what you're left with doing is probably giving 100 % of the carbs up front and then adding an extra 25 % carbs about 60 to 90 minutes after. And then again, increasing that to 50 or 75 % depending on the results. So that would require a separate bowl about 60 to 90 minutes after. And there's some infographics in the show notes to kind of

just to explain what we've been through there. So that's really good because we've got like almost a solution for each of the systems. And I suppose thoughts about that would be don't just try it once, try it once, write down what you do, try a second, you know, because sometimes you get families that come back and they're like, well, we did that. How many times did I did it once? So it's just really important to try and find what works for you. And as as Francesca says,

see what happens without doing those things first before you then put that sort of potential solution into place. So number four is probably my big thing. I've been involved in a bit of research with this and it's something that we've been teaching since 2019 and works really well if people use it. So it's not going to be for everyone but for those people who use it really find a massive value and that is if the glucose level does go high after eating say above 10 you can use

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say 15 minutes of activity to drop the glucose level by about two. And now everyone can do the two times table. So it's pretty straightforward. If you're 14, that's going to be 30 minutes. If you're 12, it's only going to be 15 minutes. And it can be any type of activity. It can be walking, cycling, dancing to YouTube, playing with your mates, just something that gets the blood pumping and the body moving. Because the main issue with the post-meal highs is you want to, first of all, get the blood pumping to the skin to get that instant absorb from where you've given it.

And the second thing is you want it delivering to your muscles as fast as possible. And the third thing is for the people with diabetes, Type 1 diabetes, their general insulin being broken down is by the kidneys. So if you reduce the blood flow to the kidneys and pump more to the muscles, more of the insulin that you've given actually gets used before it gets broken down. So you've got

three reasons why doing this type of activity when your glucose level goes high after eating is a way of really bringing

those little highs back into timing range and something that can optimize timing range. And it can also take the frustration out of the systems because sometimes people go, I'll go and put a correction in it's only 90 minutes after and it's saying there's too much incident on board. Well, there is, you just need to make the most of that incident that's already there. And the easiest way to do it is move your backside. And just really good to have almost like a recipe that you can use. think that definitely encourage people to try the recipe because

It makes it a little bit more black and white. And if you've got people who think, well, what about if the trend arrows are going up and down and all that business? There is an algorithm in the show notes that we actually teach to our families. Most are happy with 15 by 2. It's really simple. But you've got nerdy people like me, they'll want time in tight range. want, what do I do if I go above eight? Well, we need about five or 10 minutes there. There's an algorithm for you there if you want to kind of go into those levels of nerdiness.

Number five, you definitely need to still make exercise adjustments. So when these systems first came out, we would have manufacturers representatives coming in saying, these systems are amazing. All you need to do is put these activity modes on and they will manage all types of activity, which clearly wasn't the case. So this is probably the easiest way to remember. It's another sort of recipe for you. So this is the T25 T25. And that simply means if you're going to be doing activity,

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Get the target level, whatever it is, if it's a temp target for the 780, an exercise mode for the T-Slin, activity mode for the Omnipod 5, an Ease Off for the Cambridge. Why they couldn't name the same thing, who knows? But you've got to get that on between an hour to two hours before you start because you need to give the instant adjustments time to work or reduce the amount of incidents in your system. And the second, the 25 part of the first T25 is...

If you're eating within two hours of starting the activity, reduce the amount of carbs you put in by 25%. So for example, if you're going to eat 100 grams, you're down in 75, not 100. Obviously, they did a simple one there because the maths are easy for me. That's your first T25. You will still need to check your glucose level prior and every 30 minutes. Now, if the glucose level is less than seven, you'll need probably anywhere between five and 15 grams of carbohydrate to push it up above seven so that you can manage the activity.

And then when you finish, the other T25 is turn the target off as soon as you finish because you're likely insulin deficient at that point. And maybe do a 25 % reduction in the carbs for the meal afterwards to prevent the glucose level going low from insulin sensitivity if the activity has

been over half an hour or 45 minutes. So I suppose, again, thinking about that in a sort of slightly different way.

is obviously the algorithms working all the time, but if you give insulin for food, whether you turn exercise mode on or activity mode on or ease off, you're never gonna, that insulin that you're giving for food will still be there and still work. So that's whereby you need to think about taking that 25 % off if you're doing that activity within that sort of timeframe. Yeah, absolutely.

Just keeping it simple for you. And obviously T25, T25 is where you start. But if you try T25 and with the first T25, you still go low. Next time you reduce the carbs by 50%. Or if you go high next time, you don't do the insulin reduction. So again, in the show notes, there's a little algorithm that you can follow for some basic exercise advice. But obviously with exercise, the glucose seriously never lies. Whatever you try, if it works, stay with that strategy. If it doesn't work, you need to modify that strategy. Let the glucose be your guide.

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Okay, number six, CGM accuracy. So obviously these systems are being driven mainly by the glucose level and the trend arrow. Therefore you want a sensor as accurate as possible, as long lasting as possible. And also you need to look after your sites because if your sites become a problem because of infections or irritation, you're going to be limited by what these systems can do if you can't get CGM readings.

So we've got some sort of tips here from our clinical practice. The first one is pretty straightforward. Don't put the continuous glucose monitor in an area where you bend a lot or that is scarred from previous insulin, because that will mean if you're bending it all the time, you're to be moving the filament and dislodging and disrupting. That's not going to help. And then there's something that I got from when I went to one of the conferences, which was slow and low, which means that when you're peeling off the center or even the cannula for that matter, you

put something ideally like Lift Plus on, which will remove the adhesive and you nibble around the edges slowly and peel it off slowly. You don't take the manly approach and just whip it off in one go. And absolutely. And when you look at the research behind, because basically if you're just ripping it off, you're just destroying that top, the dermal layer of the skin every time you're just damaging it every time. So you're just putting yourself more at risk of getting like a dermatitis, eczema, tight.

sort of reaction at the skin side. So, and we need the CGM to be on to be able to use the system. So it's really, really important to look after the skin and there's a lot of work that's going on behind the scenes, isn't there, in terms of support and advice for that? Yeah. And obviously

once you take it off, make sure you moisturise. You can use things like tea tree cream and oil to just look after the areas.

because if you don't look after the skin, you're going to run out of real estate to actually get the benefit of automated insulin delivery systems. Now, in terms of accuracy for continuous glucose monitors, the arm is the key because it's generally where people have got the smallest layer of fat between the blood and where the sensor is being measured. So generally, the arm is the most accurate because of that reason, followed by the abdomen, followed by the bum, because generally the bum, there's more fat tissue. There's a lot further for that glucose to travel.

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Be careful with the application. You see it all the time that people putting a sensor on, they're sticking it against the person's arm and like really ramming it against the arm and then pressing the button and they went, did it hurt? Yeah, of course it hurt. Cause you just stuck the needle in my arm. So once you want to be as careful as possible. one tip that we found for the G6 is if you put the G6 on the arm, it's already, the adhesive is already on, then you can actually slightly pull on the G6 away from the body, which takes the skin away from the muscle.

And then you can insert it that way you won't get any hitting the muscle. So that's a bit of a top tip really. And then we talked a little bit about this in the first session, but calibration. So if you're going to calibrate because you want to nudge the sensor back into range, you need to make sure that blood glucose number one is a very accurate measure. So wash your hands, make sure your hands are clean, make sure your meter is quality controlled, your strips are in date.

and that you do two good, you wipe away the first drop when you do your finger prick and you get two tests and you average out the two before you put the calibration in. That way then you won't end up getting a one-off reading which destroys the sensor accuracy and it actually becomes something you wanted to do to nudge it back on track. You've ended up making the problem worse. Yeah. And I just probably just going back to sort of skin integrity and things with sensors, pod sites, cannulas.

There's loads and loads of advice out there that's accessible for people to use. I suppose one of the things that I've seen in our practice is that we're not necessarily systematic in our approach. So it's really important that if you get into some skin integrity problems or issues, that it's not that you try everything at once. So, you know, such as a skin safe or a calve line or whatever that you try.

one for a couple of days, it's really important to go systematically through those things before we move on to the next. And obviously there are, you know, if there are issues, then it's really important to think about a referral to dermatology as well, to get advice and support for that

because we want people to be able to use the systems and there will be a way of doing it and there'll be a way of helping those or minimizing the risk of those reactions occurring.

John Pemberton (27:46.125)

And one thing to consider, the sensor is likely to be at least accurate on the first day because of problems when you insert the sensor, you get local disruption. If you want some way people do get around that is put the new sensor in a day before, give it a chance to bed in before they start the next one. So that's an option if people have real problems on day one.

The next one really is kind of about the insulin. So don't forget the basics wherever you're putting the insulin in, it needs to follow a good technique. So just like you would do for injections, rotate the sites, make sure it's not on a bendy area. Make sure you're changing every three days. Make sure you're looking after the skin. But these systems are fancy and brilliant, but they run off continuous glucose monitoring readings and insulin going in. If those two things don't happen, these systems can't do what they need to do. So don't forget the basics in terms of looking after the insulin part.

Yeah, no, absolutely. Next one is probably an area that I'm a professional in, which is alcohol management with type one diabetes. So we'll probably do a separate podcast on this at some point, but just for simple version for this perspective, especially with AID systems is generally with alcohol. What happens is the alcohol gets prioritized to be detoxified by the liver, which means the liver stops putting glucose into your bloodstream.

So normally you have basal insulin to look after the glucose that's being produced from your bloodstream. Therefore, if that's not happening, you don't need as much insulin. but that's all based on the volume that you drink. So the easiest way to think of this is one unit of alcohol takes your liver one hour to process. So if you have a small glass of wine, which is two units, you don't need to bother. If you have a two bottles of wine, which is 18 units of alcohol, that's the next 18 hours that your liver is out of action in terms of.

putting out glucose. So you absolutely need to think about it. So we've kind of put on the show notes, if you're having more than four units of alcohol, we need to think about preventing hypoglycemia. So the first thing that you need to do, regardless of the device is to put on the either exercise mode, ease off activity mode, whatever you call it. thing that basically pushes the target higher and relaxes the algorithm in general to

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to look after that. So just to put that into context, if you put the Cambridge system on, in general, it will push the target by two to three millimoles and relax the algorithm direction by 30%. So there's quite a bit of protection offered there. For the tea slim, you could put the activity mode

on, but you'll probably want an alcohol profile that has the basal rates reduced by half and the correction factors reduced by half before you go out. So you definitely want a drinking profile.

For the Omnipod 5 system, it pushes the target up to 8.3 and relaxes the algorithm directionally by 50%. So quite a bit of correction there. But for the 780G, however, it pushes the temp target up to 8.3 and it stops also corrections, but it doesn't reduce the strength of the algorithm. So if you do go quite a bit higher by drinking alcohol with carbohydrates in, you might find that that's still too aggressive and you might need to go back into manual mode and put a temporary basal rate on for those nights where you go out drinking.

So it's just something to be mindful of. And I guess really having in mind, you don't want tight control when you're going out drinking, maybe a glucose level between seven and 10 or seven and 12. That way then the systems won't be pushing too much insulin in if you go above that, but also you stay away from the hypo range. Something too important, if you drop below seven, have 10 to 15 grams of fast acting carbs. That might mean you just change your Bacardi and Diet Coke to a Bacardi and Real Coke. So something like that, or always have glucose tablets with you.

One thing to be mindful of on these systems, if you let them go really high, it is going to put extra insulin in. So you probably need half grams carbs or quarter grams carbs for the drinks that you're drinking and the food that you're eating as you go along. Otherwise, it will push you really high and the system might push lots of extra insulin in. It really helps if you've got a sensible person who's supporting you or following you, or if you're a young person, certainly your mum and dad with the sick bucket by the side of the bed is always helpful.

But if you're going away to university, for example, having friends there that know about diabetes who are following you so they can help you if required, because the last thing you want is severe hypoglycemia because the glucagon doesn't work in those situations and you will need IV glucose in that case. It's just important to remember that.

John Pemberton (32:03.864)

We put a little sort of guide and algorithm on the show notes. And again, these are for informational purposes only. You will need to contact your team to discuss these. If you want to think about any of these, these just kind of give some ideas from our practice. But we'll probably do a further podcast on partying with type 1 diabetes at some point where we'll get into some more of the specifics.

And the next one we've kind of put is sleep optimisation. all these systems are at their best overnight, but there are certain things, the different systems that you can do to manage some problems. So for again, with the tandem, if you want to go over the sleep mode. just the sleep mode is one of the, I suppose, USPs of the of the tandem T-Slim. So it obviously targets a lower

glucose level overnight by putting the sleep mode on. It's really important to have it on. You can pre-program it on to come on at different times in the week. But just worthwhile thinking about when it goes on in relation to when your last meals were because auto corrections won't work or they won't be initiated when you're in sleep mode.

but it's a really good way of optimizing that control overnight, being in sleep mode. Yeah, and most of systems we find, the other systems we find just left kind of as they are, but again, with some of the systems that offer different glucose targets overnight, such as the Cambridge system and the Omnipod 5 system, if you've got people who have changing insulin sensitivities, so for example, you've got a person who's got dorm phenomenon where the glucose level starts to rise from three o'clock in the morning and it's quite pronounced.

You can on the Cambridge systems target the glucose level down to sort of that 4.4. So it's giving more insulin and acting earlier. Similarly, if someone's an Omnipod 5 system and they've got a target of 7.2 overnight, you can drop it to 6.1. On the flip side, if you've got a young person who's very sensitive to insulin from midnight till four in the morning, you can have a higher target during that time for those two systems. That's something that you don't get offered with the 780G. So again,

John Pemberton (34:13.742)

you know, unless someone's prepared to stick the target level up before bed and then, you know, put it back in the next day, which has its own challenges. So that because you're asleep or ideally asleep for eight hours a night, it's a big part of your control. So if you can roll in at, you know, six during those eight hours, it's a long, that's almost, you know, you've already covered 40 % of your time in range covered. Yeah, absolutely. And I guess then our final one is number 10 is reviewing trends. So

Ideally, systems will pick up on trends and will support you in your glucose management by making these automated decisions. But whether those adjustments are needed in active insulin time, carb ratios, correction factors, you're only going to know if you keep an eye on your weekly CGM reports. And obviously, everyone aims for a different percentage. 70 % is the ideal. But if you're currently at

50%, getting to 55 % is a worthwhile goal. If you're currently 60, get into 68%. If you're at 17, you wanna go higher to 78. It's about walking that tight rope between what's it gonna take me to get from an extra five, 10 % and am I willing to do that within my life? it a worthwhile trade off? And only the person or you can answer that question, but you'll only know if you can keep an eye on your sort of timing range on a weekly basis on whichever system that you're using.

So guess some final thoughts really with this 10 top tips. There was some system specific stuff, but we pretty much started with the basics, which was balanced meals as often as possible. High fat meals. You've got some options to manage that optimize your activity by 15 or 10 to 15 minutes after meals to optimize or really supercharge that insulin. And then if you do go high to 10, 15 minutes drops you by two and then exercise how to manage exercise. So obviously the unique we've

sort of broken that down into the unique features that you can use on each. But the principles remain absolutely the same. So reducing that bolus pre-exercise and putting the activity mode, temp target and ease off on. That's the one. Yeah, that's right. T25, T25. Just remember that. And then we sort of delved into

John Pemberton (36:28.194)

These systems run off continuous glucose monitoring readings and insulin. So you need to look after your skin. You need to look after your sites and optimize the accuracy of all of those. And then we finished off with a bit of alcohol management, optimizing your sleep, and then reviewing your trends. So hopefully these sort of top 10 tips will give you some clues on things that if you're a user, how to get the most time in range. If you're a person supporting someone, how you can offer things further than just a little tweak of the active insulin time. And in the show notes, we've detailed all of these.

things with some nice diagrams so you can use some of these resources in clinic or if you're a person with diabetes, obviously use them, but check with your team first. So hopefully this automated insulin delivery system series have given you everything from what is AID systems? What's the decision-making criteria potentially? Top tips for each of the systems and then top 10 tips overall.

I think we've had a good start and enjoyed doing it. Yeah, absolutely. Absolutely. Good revision. I think probably next what we're going to delve into is the CGM series, which is how do we assess accuracy? What we should be aiming for either venous or capillary glucose. And then once you've decided which system kind of meets those criteria, what are the bells and whistles that you'd like to choose? You know, are you going to prioritize accuracy or certain alarm features? Are you going to prioritize connection with AID systems? So we'll cover all of that.

And certainly for the people who are on injections and pump therapy, that's not an automated insulin delivery system that will capture everything that you need in terms of options to discuss with your healthcare team. So we'll hopefully see you in the CGM series. And thanks for listening.