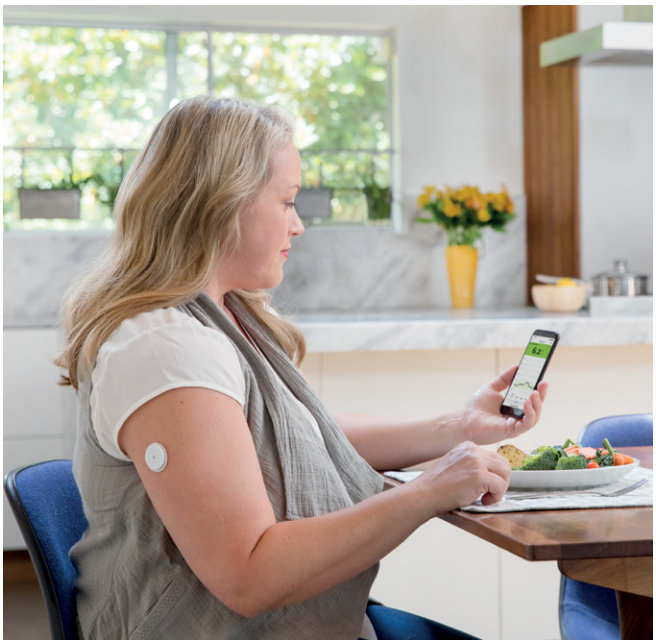
How Type 2 diabetes insulin users (including basal only, premixed insulin and basal/bolus regimes) are benefitting from technology at a primary care practice in Wales

Wales has the highest prevalence of diabetes out of the four UK nations, with an expected 1 in 13 people living with the condition[1]. The last twenty years have seen a rapid increase in the diagnosis of diabetes, predominantly in Type 2 diabetes, and there are a further 65,000 people in Wales estimated to be living with the condition who are undiagnosed[1]. Currently 10% of the NHS Wales budget is spent on treating diabetes and its complications[1].

In September 2021, Health Technology Wales (HTW) published a set of guidelines which supported the routine adoption of FreeStyle Libre sensor-based glucose monitoring[2] to guide glucose regulation in all people with diabetes who require treatment with insulin[2]. Irrespective of the type of insulin, number of daily injections or insulin regime, the guidelines acknowledge the FreeStyle Libre technology as a cost-effective intervention, compared with finger-pricking to self-monitor glucose levels[2]. In line with the HTW recommendations, Ashgrove Medical Centre in Llanelli, Carmarthenshire, Wales, began a programme of initiation to encourage insulin-dependent Type 2 diabetes patients to use Abbott's FreeStyle Libre 2 system to help manage their diabetes.



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Ashgrove Medical Centre falls within the Hywel Dda University Health Board and serves a population of 7,921 patients in the local area. The practice cares for a total of 574 patients who are living with diabetes. Of this total, 531 are living with Type 2 diabetes, with 64 of the patient cohort using insulin to support the management[3] of their diabetes. Within the 64 patients, 30 of them are using basal only insulin, 12 are using basal/bolus insulin, and 22 are using premixed insulin.

ENGAGING PATIENTS TO SUPPORT BETTER SELF-MANAGEMENT DECISIONS

Continuous glucose monitors (CGMs) can be a useful tool in helping patients to better engage with their diabetes management[3], as they are able to see the real-time impact that food, exercise, stress, and insulin can have on their glucose levels.

Elizabeth Evans, Lead Nurse who specialises in diabetes at Ashgrove Medical Centre, has been working closely with patients living with Type 2 diabetes at the practice since March 2021, and introduced the FreeStyle Libre 2 system to patients who are insulin dependent, or are primed to start using insulin.

Liz said: *"Since introducing the FreeStyle Libre 2 system to patients who were primed for insulin, we found that their behaviour would often change in line with what they learnt from wearing the sensor. For example, some patients would be more careful about what they ate, and considered what made their glucose levels spike. In some circumstances, their diets improved so much, that it delayed the initiation of insulin.*

"Patients using the sensor are also able to recognise how different types of exercise can impact their glucose levels. Effectively, it helps identify which activities cause their glucose levels to rise or drop, enabling them to manage their levels more efficiently, leading to improved glycaemic control.

"CGM also reduces the need to finger-prick, which the majority of patients are happy about. Testing glucose levels this way can be very ad hoc, making it difficult to monitor and manage. But with a CGM, the readings are instantly accessible and easily obtainable by the patient. We do, however, still encourage patients to finger prick test if they are feeling unwell."

Liz added: *"I would encourage practices to offer diabetes technology in line with the HTW criteria, to any patient already on insulin, so that patients can make positive self-improvements before next seeing their healthcare professional and receiving further advice. In most cases, this improved self-management routine using CGM, has led to less reliance on the clinical team in practice, saving time and money in the long term."*

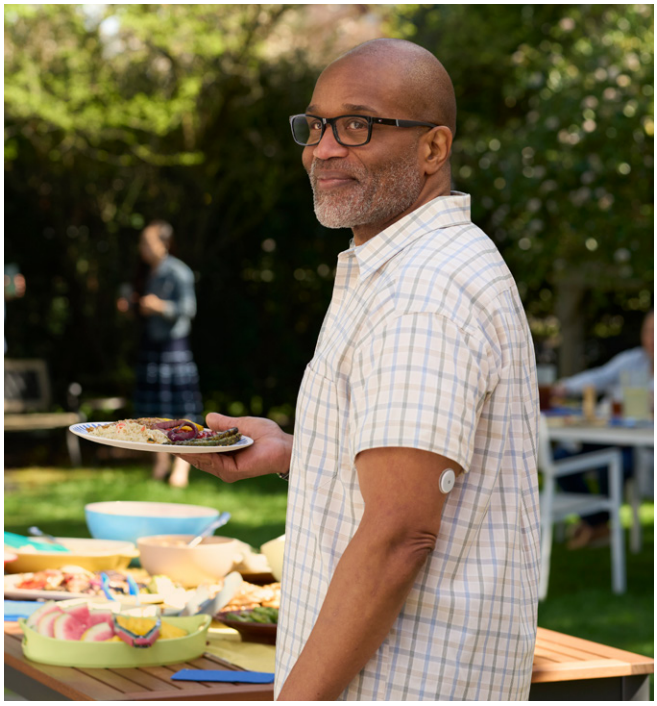
STRIVING FOR BETTER PATIENT OUTCOMES AND IMPROVED CLINICAL DECISION MAKING

Liz continued: *"At the practice, we use the FreeStyle Libre 2 system for patients already on a basal, premix or basal/bolus insulin regime. With the patient being on insulin, it's a case of setting them up on the system and adding them to my cloud-based monitoring system, LibreView[4]. Patients can use their phone to link to the sensor and to gain its full benefit, or alternatively we can provide them with a reader if they do not have a compatible phone[5].*

"However, what I also do is provide a patient due to start insulin with a sensor, to gather information on their glucose profile. This enables us to access the full glycaemic picture[6], which helps identify the most suitable insulin to introduce or accurately adjust the insulin dose or regimen, and in some cases has even led to insulin no longer being initiated.

"By having access to a fuller picture of what's going on with a patient's glucose levels, rather than a snapshot in time based on the reliability of the patient carrying out consistent finger-pricking, these trends then support our clinical decision-making process more effectively, and enables the practice to provide a more accurate level of care.

"During the first sensor wear period, we're also able to understand which type of insulin is better suited to the patient, instead of following the more traditional method of starting with a basal insulin, then moving onto a mixed insulin if glucose levels are not under control, and then eventually following the basal/bolus regime. For example, in some cases I've initiated patients onto a mixed insulin, when they've been using the CGM for two weeks prior.



Images are for illustrative purposes only. Not real patient.

"I find that doing this supports better clinical decisions. If the patient has a flat glucose profile trend which is visible via the data, then they only need a basal, but if they have a fluctuating profile trend then a mixed insulin is more appropriate.

"By working out early on what the best solution for each patient is, we can progress their therapy and reduce the insulin trial period by up to two months, rather than having patients trial three months on a basal insulin before realising we need to change to a mixed insulin or add in a bolus insulin."

HOW DIABETES TECH CAN OFFER LONG-TERM BENEFITS TO PATIENTS AND PRACTICE

To support patients starting on the FreeStyle Libre 2 system, there are a number of ways this can be done. For example, for those patients who are able to self-start, the training can be delivered online. Alternatively, patients can be supported by their healthcare professionals, or Abbott can also lead group new starter clinics to support practices and save time.

Liz said: *"Most patients living with Type 2 diabetes on insulin have welcomed the technology with open arms, as they have been asking about access to it over the last few years, when we weren't able to offer it to patients on a single injection.*

"Increasing access to CGMs for this population is hugely beneficial, as we can provide accurate care and advice, and once they're comfortable using it, we're able to reduce in-person consultations and carry out remote appointments, effectively saving time for our practice, and patients."

Liz added: *"Other features of the sensor include the ability to keep families informed on the patient's readings, via the LibreLinkUp[7] app along with the offer of ongoing support. Additionally, the glucose alarms[8] feature offers patients and their families reassurance if they suffer with hypoglycaemia anxiety.*

"According to patient feedback, the flexible glucose alarms which can alert them of hypoglycaemia or hyperglycaemia episodes have been extremely helpful. For example, with a frailer population, we're able to set the alarms at a safe level to keep their glucose levels a little higher to prevent hypos, adopting a preventative approach, leading to a reduction of long-term complications and use of secondary care and emergency services.

"Finally, a newer feature of the FreeStyle LibreLink app[5], is the connectivity to the NovoPen Echo Plus and NovoPen 6. These are re-usable pens that use cartridges that can connect to the app and download the injections given, including the doses and times given. Increasingly, my patients are environmentally aware and like the positive impact these have on the environment along with improving their management. From a professional point of view, I find these pens particularly useful to see when and how much insulin is given, when a patient may not fully remember when they gave their insulin and how much. By tapping the pen to the phone, this information is downloaded to the FreeStyle LibreLink app. This is an exceptionally good safety feature for the patient themselves, as often they may not remember if they have taken their insulin, so instead of taking the insulin, they omit it, in case they double dose. Using these pens enables patients to check when and how much their last dose of insulin was."

Liz concludes: *"Improving the management of diabetes within one practice such as ours at Ashgrove Medical Centre, supports the case that wider access to diabetes technology would be beneficial across the board, not only to improve glycaemic control but to reduce the complications associated with poorly controlled diabetes, which accounts for 10% of the NHS budget in Wales."*

This notion is also supported by Dr Rajeev Vaikunthanathan, the lead GP at Ashgrove Medical Practice.

He said: *"In my experience as a clinician working in a clinic which supports diabetes management, I have found that compliance around regular finger-prick testing can be poor. This provides insufficient information on blood glucose monitoring, resulting in a significant obstacle to manage patients effectively and safely. The decision to make CGMs available to all patients on insulin is therefore absolutely the right decision.*

"Within primary care, it would be extremely useful to train all levels of primary care staff working within a diabetes clinic, to be assured in their understanding of CGM.

"It is our hope that even small projects such as ours will contribute to recognising the value of how a CGM is improving the management of diabetes in the community, and will aid in the decision to make CGM systems available not only to those with Type 1 and Type 2 diabetes on insulin, but to all living with Type 2 diabetes."

"Having access to CGM has entirely changed the process of clinic consultations. We now have access to reliable and detailed glucose data, which we can logically analyse along with the user, in order to make appropriate changes to diabetes management. More importantly, people living with diabetes and using this technology are now able to benefit from high or low glucose alarms in addition to viewing trends and glucose readings every minute.

"The use of CGM alleviates the fear of hypoglycaemia, thereby giving users the opportunity and confidence to take on activity and exercise and make appropriate changes to their insulin doses. On multiple instances, through identification of persistent hypo – or hyperglycaemic episodes, it has been possible to intervene early, prevent acute complications and reduce the need for hospital admission."

Dr Akhila Mallipedhi, Diabetes Consultant and Clinical Lead Hywel Dda University Health Board

CGM=continuous glucose monitoring.

1. https://www.diabetes.org.uk/in_your_area/wales/diabetes-in-wales. **2.** https://healthtechnology.wales/reports-guidance/freestyle-libre-flash-glucose-monitoring/. **3.** Clark TL, *et al. Diabetes Technol Ther* (2024). https://doi: 10.1089/dia.2023.0612. **4.** The LibreView data management software is intended for use by both patients and healthcare professionals to assist people with diabetes and their healthcare professionals in the review, analysis and evaluation of historical glucose device data to support effective diabetes management. The LibreView software is not intended to provide treatment decisions or to be used as a substitute for professional healthcare advice. **5.** The FreeStyle LibreLink app is only compatible with certain mobile devices and operating systems. Please check the website for more information about device compatibility before using the app. Use of FreeStyle LibreLink may require registration with LibreView. **6**. Unger J, *et al. Postgraduate Medicine* (2020): https://doi.org/10.1080/00325481.2020.1744393. **7.** The LibreLinkUp app is only compatible with certain mobile devices and operating systems. Please check www.LibreLinkUp.com for more information about device compatibility before using the app. Use of LibreLinkUp requires registration with LibreView. The LibreLinkUp mobile app is not intended to be a primary glucose monitor: home users must consult their primary device(s) and consult a healthcare professional before making any medical interpretation and therapy adjustments from the information provided by the app. **8.** Notifications will only be received when alarms are turned on and the sensor is within 20 feet unobstructed of the reading device. Users must have, override do not disturb settings, enabled to receive alarms and alerts on their smartphone.