

Case study: Supporting families to adopt using a closed loop system

The 2022/23 core NPDA report has demonstrated that use of a closed loop system is associated with the lowest average HbA1c compared to other insulin delivery and glucose monitoring combinations. Across England and Wales, 14.7% of children and young people with Type 1 diabetes were using these technologies. However, in some clinics, nearly two thirds were using one. Here, Dr Michael Plunkett from University Hospitals Birmingham NHS Foundation Trust, shares how he and his team supported their patients to access and use this new technology:

Before we began: We had effectively pre-positioned ourselves as a clinic, by our attitude to technology. As early adopters, we had entered the first pandemic lockdown with about 95% of our children and young people on real-time continuous glucose sensors (the majority) or flash glucose meters so we were able to remotely access glucose data while clinics were “closed”. We had confidence in advising our families based on this data. We had a team of diabetes nurses who were keeping themselves (and the wider team) informed of technological developments, prior to general launch, including hybrid closed loop (HCL) pumps.

How we began: While HCL pump awareness was in its infancy we developed a list of suitable patients. We started with a cohort who we felt would cope best with the change and demonstrated clinical improvement to prove to our clinical team that the concept would work for us. We discussed the benefits of looping with these patients in MDT clinic settings and with nurses either face to face or over the phone. We set up group starts (off-campus because of Covid restrictions) with the support of a pump representative. This group quickly demonstrated the benefits of HCL. With increasing expressions of interest via our parent Facebook group we decided to systematically move all existing pump patients to HCL, as their current pump warranty expired, or clinical need for improvement was indicated. We also endeavoured to put all newly diagnosed patients onto HCL within the first 1-3 months of diagnosis. Readiness was agreed by the young person, family and multi-disciplinary team, with input from our MDT psychologist. From this we learnt that anyone could be made ready.

How we embedded: We began with a tubed (first available) pump. Families completed virtual training at home, before attending one of our monthly pump starts. PDSNs and the pump representative delivered 2-3 hours face to face training, with each child leaving the training wearing their pump. PDSNs met families 3 days later to support the first set change and review. Subsequently we have completed these reviews virtually. Since its recent release, we offer the “tubeless” pump which does not have pre-training with a review session set at 15 days post pump start to allow for the pump to have completed its “AI” learning. We have also looked to a third HCL pump as a solution for some of our youngest patients.

The benefits: It was undoubtedly the almost immediate observation of blood-glucose stabilisation overnight, with markedly reduced hypos, resulting in 6-8 hours of “time in range”, and undisrupted nights for both parents and children that confirmed for families and professionals that this was the way forward. It was not uncommon for parents to report their first night since diagnosis that they had slept through without alarms or worry. We could also see that young people whose attention to their insulin needs was less than ideal were achieving much improved time in range and being kept safer where previously their struggle with diabetes had the potential to be all-consuming.

The barriers: We have not considered that we had many barriers to HCL adoption by families and have had no difficulty with funding. Some families and young people have taken longer to take up the offer, and a small number have been supported to continue on multiple daily injections, because of complex development needs, intensive sports involvement or simple personal preference. We have ensured these families understand that the offer is always on the table and have encouraged them to do their own online research including exploring social media, so they remain fully informed. Traditional complex issues such as non-compliance with diabetes management, or perceived lack of ability to cope with technology, access to a phone, chaotic lifestyle, safeguarding and self-harm concerns, have not been seen as barriers. We have considered that even a marginal improvement in glucose control, if aligned with a reduction in stress or anxiety or conflict around diabetes is an overall benefit worthy of our efforts and the public funding.