

JDRF briefing: Progressing towards an artificial pancreas

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This briefing has been prepared by JDRF in advance of the roundtable on access to diabetes technology and progressing towards an artificial pancreas.

JDRF is the world's leading type 1 diabetes research charity. It funds research to cure, treat and prevent type 1 diabetes.

Background

People with type 1 diabetes rely on taking insulin every day just to stay alive, until the cure for the condition is found. It normally strikes children but can strike at any age. Type 1 diabetes affects about 400,000 people in the UK, 29,000 of them children. Type 1 diabetes cannot be prevented, and is not linked to lifestyle. There is no way to avoid it.

With this type of diabetes, a person's pancreas stops producing insulin. It occurs when the body's immune system attacks and destroys the insulin-producing cells in the pancreas.

Type 1 diabetes has a life-long impact on those diagnosed and their families. A child diagnosed with type 1 diabetes at the age of five faces up to 19,000 injections and 50,000 finger prick blood tests by the time they are 18. Effective control of blood glucose levels is a key factor in avoiding future complications and reducing costs. Access to diabetes technology is crucial to help better manage the condition.

Current state of play in type 1 diabetes treatment

Diabetes technology can be life changing. Flash glucose monitoring for example reduces the need for finger-prick testing and shows trends in blood glucose levels, which can improve management of the condition.

Continuous glucose monitoring (often referred to as CGM) can help maintain target blood glucose levels, and limit the risk of hypoglycaemia if they are used on a daily basis (ie at least 80 percent of the time). They can provide peace of mind for parents as they feature an alarm which can be set to go off when a child's levels get too low or high.

Unfortunately, people with diabetes face a postcode lottery across the UK when it comes to access to technology that can help improve and manage their condition.

On the 1st of November 2017, the Freestyle Libre, a flash glucose monitoring device, was made available on the NHS Drugs Tariff, which means that in principle it is available to people with diabetes on NHS prescription. However, it is up to Clinical

Commissioning Groups to decide whether to make the Libre available on the NHS and under what criteria.

According to Diabetes UK, only two in five areas in England and one in three areas in Scotland have the technology available to people who meet the local health bodies' criteria. Thousands are left waiting as 38 Clinical Commissioning Groups (CCGs) in England are yet to make a decision. This is in contrast to Northern Ireland and Wales where anyone that is deemed to qualify has access. The concern is that decision makers are only looking at baseline initial cost rather than the potential long-term impact this could have for the NHS and patients.

NICE has issued statements detailing when CGM may be suitable for someone with type 1 diabetes, however there is no statutory obligation on CCGs to provide funding for the technology, though some CCGs do have policies for prescribing it in certain circumstances.

Insulin pumps are an increasingly common treatment for type 1 diabetes. An insulin pump delivers insulin every few minutes in tiny amounts, 24 hours a day. Insulin pumps reduce the need for multiple injections and give the user the ability to make smaller, more accurate adjustments to insulin delivery.

NICE has produced Technology Appraisal Guidance on the use of insulin pumps for people with type 1 diabetes (TA151), however uptake and use of insulin pumps is still quite slow. The most recent National Diabetes Audit, published in July 2017 showed that whilst overall uptake of insulin pumps had increased, there were still large variations in access. A number of NHS Trusts only have 1 in 20 people or less using an insulin pump, compared to some Trusts that provided access to almost 7 out of 10 people.¹

Barriers to patient access to technology

In addition to the examples above with regards to the current state of play, other concerns lie in what the UK-EU relationship will look like post-Brexit and what impact this would have with regards to access to medical devices and medicines. The Association of British Healthcare Industries (ABHI) found in a recent study that of the £5 billion worth of health technologies used in the NHS in 2016, £3.2 billion came from the EU. Currently, full regulatory alignment with the EU has ensured the continued supply of safe and effective medical devices and medicines to the UK but this could very well change once the UK leaves the EU.

The Trade Association MedTech Europe emphasises the need to maintain custom arrangements and regulatory controls as this allows medical technologies to cross borders with minimal delay as possible. If these were not maintained then the likely outcome would be an increase in the cost of supply to patients which could in turn impact patient safety.²

¹ <https://digital.nhs.uk/catalogue/PUB30027>

² <https://www.medicaldevice-network.com/features/ensure-smooth-trade-med-tech-post-brexit/>

What changes need to occur to progress towards an artificial pancreas?

JDRF is spearheading a global strategy to deliver artificial pancreas technology in the UK, which will change the lives of those affected by type 1 diabetes. In the UK the artificial pancreas is in advanced human trials led by Dr Roman Hovorka at the University of Cambridge.

An artificial pancreas is pieces of technology that could do some of the job of a healthy pancreas, providing exactly the right amount of background insulin to the body as it's needed. This then removes some of the time and effort that goes into managing type 1 diabetes.

The artificial pancreas consists of a continuous glucose monitor, a computer programme and an insulin pump that work together to automatically control background insulin levels.

The system currently being developed by Dr Hovorka's team at the University of Cambridge would be able to take over much of the management of insulin delivery throughout the day and night, and keep blood glucose levels in target range for longer periods of time.

A commercially available form of first generation artificial pancreas exists in the USA, the Medtronic 670G, however this is currently only approved for use in those 14 years and older. Trials are currently ongoing in children as young as seven and Medtronic plan to bring the product to market in Europe once they have concluded.

As only 12% of those with type 1 in the UK are currently using insulin pumps, it's potentially a concern that health care professionals would be unlikely to recommend an artificial pancreas if someone is not using a pump/CGM already.

If the NHS access issues to today's type 1 diabetes technology can be addressed, a path can then be cleared for the artificial pancreas.

In summary, having access to the right technology can be life changing. It can help people better control their condition and can save the NHS money through reduced complications. People with type 1 diabetes deserve to get the type 1 diabetes technology they want and need on the NHS.

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