

# Digital implants: Healing from the Inside

14 June 2018 | **Digital Transformation, Healthcare** | [Jens von der Brelie](#)

**Reading time:** 5 minutes

**“You can’t digitalise drugs!” - or can you? Even the pharmaceutical sector is being shaken up by digitalisation - not least thanks to inventive start-ups beavering away to undermine existing business models in the sector.**

Today, how digitalisation will play out in the pharmaceutical sector is becoming a lot clearer. In this series of articles, we discuss how we see this process playing out - what we are already seeing today and how we see this developing in the future. Following on from our first two articles, on [mobile apps](#) and [wearables](#), this third article looks at digital implants.

## **Digital implants can be used to perform internal measurements and to control nerves**

With the rise of continuous glucose monitoring (CGM) devices, digital implants have enjoyed a high profile in recent months. CGM devices are small digital ‘labs’ implanted partly or wholly within the body. More widely known and already long established are pacemakers, which use electric signals to control the heart muscles.

But are patients happy to use implants? Using an implant carries a risk, and users will need to carefully weigh up this risk. The severity of the disease it aims to combat will probably be crucial in determining whether or not an implant is appropriate. One major advantage over conventional drugs is that implants can often be placed directly at the site of action, allowing them to exert highly targeted effects. As a result, they are likely to produce far fewer side effects in other parts of the body. Implants work around the clock and can therefore provide patients with 24-hour protection. In addition, because their functions are automated, there is no scope for patient error in operating the devices.

On top of this, the advantages of digital medicine in general apply equally to digital implants. Providers can easily release updates, allowing them to react rapidly to any new medical discoveries. And accompanying apps can ensure that patients are better informed about their treatment and reduce anxiety. All of these benefits can improve treatment outcomes, with the result that use of implants could help make therapies more effective.

## **Continuous glucose monitoring**

The market for continuous glucose monitoring has been shaken up by the launch of the [Freestyle Libre from Abbott](#). The Freestyle Libre is a great solution with very low costs. The electronic device is worn by the patient for a period of several weeks. On being applied, it

inserts its sensors into the body automatically. A popular alternative is Roche's [Eversense XL CGM system](#), which is implanted in the body for several months. It consists of an implantable sensor and a removable, rechargeable smart transmitter with a vibrating alarm.

In vivo diagnostic implants, which measure glucose internally, offer the advantage over in vitro diagnostics (with test strips) that they are able to take much more frequent measurements. Having more measurements makes it easier to detect trends and make predictions. The benefits therefore go far beyond mere information. Patients are able to optimise their treatment, reducing the risk of long-term damage to their health.

### **Start-up Galvani plans wide range of applications**

A pacemaker is an example of a digital implant which uses electrical stimuli to control functions within the human body. Pacemakers have been around for many years. Relatively new, by contrast, are efforts to bring artificial electronic devices into very close proximity with nerve cells to enable them to record or transmit individual nerve signals. Such a system might potentially be able to override and modify biological signals.

[Galvani](#), which is 50% owned by GSK, is working on a solution in which digital signals interact directly with nerves. The system could be used to eliminate phantom pain, for example. It could also be used to correct wrong signals. One potential application would be to modify the blood pressure signal from the kidneys. If successful, this could mean that many patients no longer need to take antihypertensive drugs. Galvani has set its sights on a whole range of diseases which it believes could be cured using digital signals. In particular such a system might be able to 'switch off' pain with a high degree of precision and without altering pain sensitivity in the rest of the body.

We should also say a few words here about cybersecurity. This is of course a key issue when dealing with implants. If a device featuring external digital access were to be hacked, the consequences for the patient could be extremely serious. The hacker would also have considerable power over patients implanted with the device.

### **Digital implants for data mining and new business models**

Digital implants will enable real time solutions for improved diagnosis and entirely new therapies. For patients, the advantages are clear. But what about providers?

They benefit by offering patients innovative treatments which are both more effective and have fewer side effects. But they also get their hands on valuable data, which could give them a clear edge over their competitors. For example, they can get to know their users better by analysing this data and user ratings. This can lead to closer contacts with users,

which can be further enhanced using tools such as chatbots. In addition, because almost all digital implants have associated apps, they also pave the way for new distribution and payment models. Here, the pharmaceutical sector enjoys the good fortune of being able to learn from other industries which are further along the road to digitalisation.

**Summary: Providers of digital implants can gain an important edge over their competitors - which could prove to be a major disruptor for the sector and lead to lasting changes.** If you want to know how pharmaceutical companies can meet this challenge and adapt their business models for digitalisation, you might like to attend my talk at the Health Meets Future Summit in Frankfurt on June 18, 2018.

If you would like us to email you the slides from the talk, click [here](#).