

Digital Tools Case Study

Quick intro to yourself and any contact details you're happy to share ...

Denton Physio Technology is a UK based technology company providing digital healthcare solutions to the public and private health sectors. In 2020 Denton Physio Technology introduced the re.flex system, an innovative 3D motion sensor solution used for preventative management and pre-operative rehabilitation.

re.flex allows patients to undergo remote rehabilitation, improving measurability, adherence and subsequent outcomes for patients and clinics.

Denton Physio Technology is continually looking for opportunities to expand it's evidence base by piloting the product or conducting clinical trials.

Please visit our website: www.dentonrpa.com

Contact us: admin@dentonrpa.com or call at 07828484000



[Watch Product Demo](#)

https://www.youtube.com/watch?v=3Wa_zYECOGM

What physio services do you provide? (e.g. specialty, conditions, location, patient demographics)

Prevention and Conservative Management - re.flex can aid preventative management of knee and/or hip conditions and potentially reduce the risk of post op complications.

Post-surgery rehabilitation - People who have undergone knee or hip replacement surgery or sports medicine surgeries (eg. anterior cruciate ligament) and need post-surgery rehabilitation.

The goal of re.flex is to offer an easy to use, cost-effective and efficient digital physiotherapy assistant for patients. The main benefits of using re.flex include reducing pain and avoiding surgery (for knee/hip OA prevention) and effective post-surgery rehabilitation with a high number of physical therapy sessions and well documented medical outcomes.

What tools are you using to deliver your physio services digitally?

How it works. Figure 1 shows how re.flex works from the perspective of a patient. In order to use re.flex as a digital physiotherapy assistant, the patient will use a set of two motion tracking sensors, mounted above and below the injured joint, connected to the re.flex mobile application.

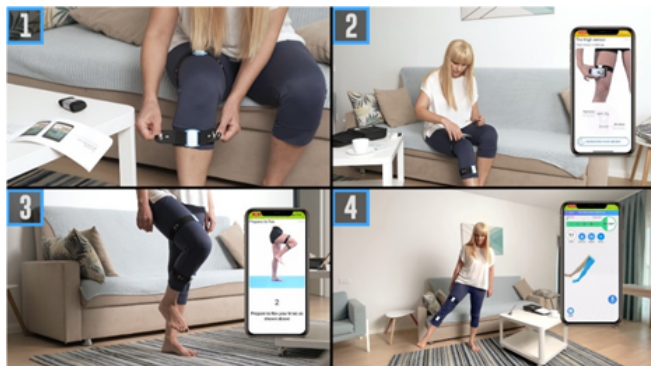


Figure 1: How re.flex works

Patients can place the sensors anywhere on the quads and calves (*Sensor positioning - 1*). The application receives the data from the two sensors via Bluetooth (*Sensors pairing - 2*) and after a few simple movements performed (*Calibration - 3*) it combines this data received from the two sensors to provide real-time 3D representation of the leg on the patient mobile device (*Live exercise assistance - 4*).

The technology and features. re.flex consists of the following hardware and software components (Figure 2):



Hardware sensors (1). These are the sensors mounted on the patients' leg to monitor and measure their movements.

Elastic straps (S, M, L) (2)

Charging cable (3)

Mobile tablet

Mobile app. The mobile application has two separate interfaces, namely an administrative interface and patient interface.

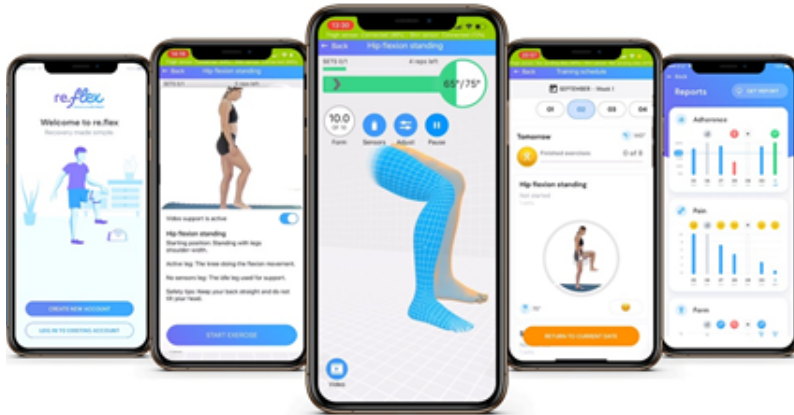


Figure 3: re.flex patient interface

The **patient interface** (Figure 3) contains the list of exercises that he needs to execute. The mobile application receives data from the motion sensing sensors, and via a **movement analysis module**, it shows the movement live on the mobile device screen, counts exercise repetitions and shows how correct the movement was performed, based on the patient's specific thresholds.

The **administrative interface** (Figure 4) shows the progress of the patients, the list of scheduled exercises and the feedback received. Receive patient daily progress reports.

The **web server** hosts a cloud-based database which stores the patient and exercise data and a Web platform that Denton Physio Technology uses internally to monitor the patients and define new exercises and programs.

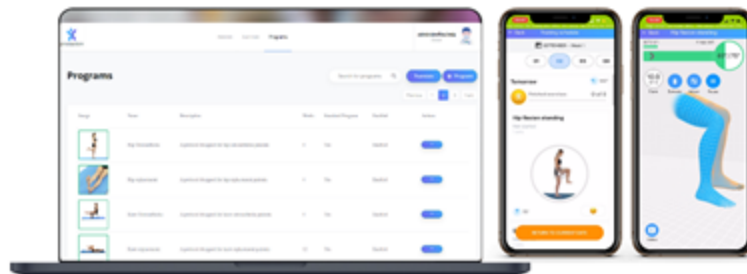


Figure 4: Administrative interface (in development)

How have these services replaced face to face contact?

re.flex 3D motion sensors are used in a complete digital rehabilitation model for patients which don't have access to a physical therapist (eg. rural areas, patients not able to reach the clinic etc) or as an adjunct to in-person physiotherapy appointments.

In the UK patients face challenges accessing physiotherapy appointments as it can be difficult travelling via public or private transport whilst managing injuries. Attending physio sessions can be very timely due to traffic, parking and waiting times and people struggle to fit it around their busy schedules. Additionally, over time the hidden costs of recovery can be significant for patients. The re.flex solution presents a remote solution to resolve these challenges for patients whilst improving outcomes and even more benefits as we live in COVID world.

What is the clinician's experience of using the digital tools?

A physiotherapist working with re.flex is able to automate his home-exercise prescription by using the built-in protocol approved by clinicians and remotely monitor the patient's rehabilitation progress. At any time during the monitorization, the physiotherapist is able to request an face to face follow up session with the patient in clinic or virtually.

The customisation of the protocol is done automatically by the system for the preventative model (coming soon for the post-surgery product), based on the patient's feedback. This unique feature gives the physiotherapist the opportunity to approach the home exercise plan in an efficient and time-saving manner.

Do you have any patient feedback on the digital physio service you offer?

Patient A, 57

"I had a total knee replacement and the beginning of my rehab was a bit long because there wasn't much improvement of my knee mobility. My doctor recommended me re.flex. Without this system I wouldn't be able to do the exercises as accurately as the device assisted me to do it. re.flex is a very precise device and using it I was able to ensure that no movement could be harmful for my rehabilitation"

Patient B 49:

"A few years ago I was diagnosed with bilateral OA. The pain I had been feeling was intense and I needed medication. Everyday I had to take painkillers and I wasn't able to walk without them. After 2 months with re.flex I no longer need medication. re.flex improved my mobility and my effort. Now I can walk, take strolls and dance without pain. It's a miracle and I didn't believe these results can be possible in such a short amount of time"

Watch more video testimonials [here](#)

Any tips to others exploring using digital tools in physio services?

Paper exercises and applications with video exercises have been around for a while. But this technological advancement allows clinics and physiotherapists to do more than simply prescribe home exercises. Having the opportunity to check the quality of the execution and remotely assess a patient's progress is the future.

Trial re.flex in your practice and experience the benefits of the first digital physiotherapy assistant with live 3D assistance. We find that our patients love it and we are sure yours will too!