



this is **MedTech** in *Community Care*



MedTech Europe
from diagnosis to cure

Community Care Sector Committee

Living with dialysis, then and now

The thought of an artificial organ that's keeping you alive from outside your body – literally carrying the blood through tubes from your body into a machine sitting next to you, which cleans it and then pumps it back into your veins – sounds like something out of a science fiction film. Yet for people with kidney failure like 25-year-old Neil Robinson, not only is it very much a reality, it's a way of life. Having been the UK's longest-waiting transplant patient until very recently, Neil can tell you pretty much everything there is to know about being on kidney dialysis. After all, he was hooked up to this life-saving technology three times a week for over 22 years before having a transplant in January 2014. Although many people develop kidney problems later in life as a result of other health problems like high blood pressure or diabetes, Neil was born with a condition called kidney reflux, which is a blockage of the kidneys. These organs play a critical role in eliminating toxins from your blood by acting as filters that remove unwanted water and waste, which are ultimately flushed out of your body when you urinate. When the kidneys don't work properly as in Neil's case, the build-up of toxins in the blood is life-threatening.

Dialysis does the job that the kidneys cannot do. Various versions have been around for decades but today there are two main types: haemodialysis and peritoneal dialysis. Haemodialysis removes waste and water by circulating the person's blood outside his/her body through an external filter called a dialyser, which is attached to needle(s) inserted into an access point inside the person's arm (the fistula). Tubes lead from the needles to the dialyser. The fistula is surgically created by joining an artery and a vein to increase blood flow, allowing easier access to the blood for dialysis. "It makes a buzzing sensation in your arm when it's touched but you don't really feel it when you're walking about. I've had two: I got the first one in my left arm when I was 14, but unfortunately it only lasted about a year. I got another one in my right arm when I was 18," says Neil. "The fistula looks like a lump. The more it gets needed, the more it grows, and the bump never goes down," he adds matter-of-factly.



Cochlear implants: 50 years of 'miracles'

Imagine you had never heard sound – until your doctor flicked a switch and introduced you to a sense you had never known. Or think for a moment what it would mean to you to lose your hearing as a child only for a tiny device to give you back what you thought you had lost forever. Some call it a 'miracle' but it's not. It's just the fruit of half a century of innovation. Jonathan, the old lost his hearing at the age of four months following a bout of bacterial meningitis. The disease damaged his cochlea, a small piece of the inner ear which contains thousands of sensitive hair cells. These hair cells send signals to the brain with information about the pitch and loudness of sounds. If your brain does not get these signals, you cannot hear. For Jonathan, all the auditory 'equipment' he needed was in working order, except for the cochlea. So his doctors saw him as a good candidate for a cochlear implant – a device that sends electrical messages directly to the auditory nerve, bypassing the cochlea.

Cochlear implants were invented in the 1960s by Dr House – a Californian-based otologist. Several decades of international research and hundreds of prototypes later, these tiny devices are giving people the power to hear – and, in some cases, the ability to speak. The implant consists of a microphone which picks up sound waves and a speech processor that converts these waves into an electrical signal. Inserting the device requires surgery to place the receiver in the bone just behind the ear, and electrodes are coiled around the cochlea. Young children are often selected for cochlear implants because they have heard before and their deafness has not yet had a profound impact on their speech. Adults can benefit too. These technologies are at the cutting edge of innovation, dramatically transforming people's lives. Of course, many people who are hard of hearing can benefit from (relatively) simple hearing aids which amplify sound. These small devices can be fitted externally or placed just inside the outer ear without the need for surgery and older people often benefit from these devices as their hearing capacity fades with age.





Keeping diabetes in check! How to make it a game for kids

When young children are diagnosed with diabetes, the news can be shocking both for them and their families. Yet, once the initial worry has passed, getting into the daily routine of testing and shots can even be a laugh...

The path usually starts with doctors explaining the diagnosis and symptoms in ways that are informative to parents and accessible to children. There are numerous online sources of information that can help too.

Next comes understanding how to manage insulin levels. There are a number of options today which didn't exist ten years ago. Between insulin pumps and three-second testing devices, managing diabetes has become much easier than ever before. Having a healthy diet is also essential in managing the disease. A wealth of online tools can help children learn about sugar in food and understand how their body works.

And while pricking your child with a tester or a needle is never fun, most kids take it in stride. Brave little four year old Connor, even outdid his parents when he used the insulin kit by himself for the first time... and he even wanted to "get a lot of blood".

Of course none of us want to see our babies on blood testing and syringes every day, but diabetes is manageable, and can be done so in a light hearted manner.

By the way, for all those in doubt... it's diabetes, not diabetUs.

Smarter, sexier more comfortable prosthetic limbs

From an early age, David Sengeh knew more about prosthetic limbs than he would have wanted.

Raised in Sierra Leone during a brutal civil war, he saw loved ones lose arms and legs during vicious assaults. 8,000 men, women and children lost limbs during the war but many amputees would not wear their prosthetics. He wanted to know why.

David learned that traditional manufacturing methods were creating prosthetic sockets which were deeply uncomfortable. Amputees were suffering from pressure sores and blisters due to ill-fitting prosthetics. 'It does not matter how powerful your prosthetic ankle is, if your prosthetic socket is uncomfortable you will not use your leg – and that is just simply unacceptable in our age.'

David embarked on a PhD at MIT Media Lab where he designed a more comfortable prosthetic socket drawing on the latest in magnetic resonance imaging (MRI), computer modelling, and 3D-printing. The result is a quick and cheap method for designing and producing prosthetic limbs which are tailored to individuals. In the words of a patient who took part in a trial of the product: 'It's so soft it's like walking on pillows. And it's f-ing sexy'.





When kids get glasses before their first birthday

I don't think there's anything more adorable than kids with glasses. It probably started when I saw Jerry Maguire...

I got my first pair of glasses when I was 7. And I was absolutely thrilled about it. Though it seems to be an unwritten rule that I should've been embarrassed and annoyed and hate the whole idea as it is. I still remember the walk home from the optician, holding my mother's hand and sliding my glasses up and down my nose, fascinated at how clearly I could see. I was happy to have my glasses. For one, I could see properly. And they also looked pretty cool. My first pair lasted for about 6 months, and the next five pairs lasted about half that long. Everyone has a different reaction to the first time they put their glasses on, and what inspires more joy than watching a baby try on glasses?

Blind, paralysed but 'unbreakable'

By any measure, Mark Pollock is an extraordinary man with an extraordinary story.

Mark's eyesight was failing by the time he entered university but it did not stop him becoming a champion rower, learning to salsa dance and meeting his beautiful wife, Simone. He was completely blind by the age of 22, yet he still managed to become the first blind man to reach the South Pole. Styling himself as an adventurer and motivational speaker, Mark's story inspired others to overcome adversity. Then, just a few weeks before he was due to marry Simone, Mark faced his biggest setback: he broke his back after falling from a second-floor window.

The accident left him paralysed, devastating the young couple's plans to start their own family. But Mark Pollock had spent his life sizing up obstacles in order to overcome them. Knowing that a long, hard road lay ahead, Mark and Simone somehow mustered the strength to take on the most daunting of tasks – finding a way to help a paralysed man to walk. Now, four years after he lost the use of his legs, Mark and Simone are at the forefront of exploring robotics technology. They are working to apply the latest in bionics, electrical spinal stimulation, pharmaceuticals and physical therapy to give hope to those who have been told that they will never walk again. It has, of course, been a testing time for a young couple whose best-laid plans were turned on their head by a tragic twist of fate.

Yet their relationship endures and Simone, a lawyer, has herself become something of a lay expert in cutting-edge robotic technologies and spinal injuries. It has been a long four years but there is a sense now that their efforts will pay off in the long run. Somewhere at the intersection of technology, pharmacology and a truly remarkable human being lies hope for a radical breakthrough for what is currently viewed as irreversible paralysis.



How the Selfie Generation is breaking the ostomy taboo

Model Bethany Townsend posted selfies wearing nothing but a bikini and a colostomy bag. The world watched, and the world's ostomy community took action. It's hard to imagine a more image-conscious industry than the world of fashion. But one very brave model has posted a series of selfies that are changing attitudes to a medical condition most people would prefer not to talk about. If you passed Bethany Townsend in the street or saw her picture on the cover of Cosmo, you'd probably think she looked like a typical fashion model. But what you wouldn't know is that Bethany has a colostomy bag attached to her abdomen to collect waste from her misfiring digestive system. Without it, she would die. Her intestine was badly damaged as a result of Crohn's disease and, while colostomy surgery may have saved her life, it left her with a small opening in her abdomen.

This might have blunted the ambition of some aspiring models but Bethany wasn't going to let this hold her back. She started posting selfies on Instagram while wearing a bikini with her colostomy bag front and centre. The photos went viral. Fast. Then something incredible happened. Other brave women also started posting bikini selfies showing their colostomies. Soon men were getting in on the act and before you could scream grassroots-disease-awareness-campaign, a taboo had been smashed.

The meme did wonders for Crohn's awareness and for the technology that keeps people alive after their digestive systems let them down. Crohn's is a disease that affects the digestive system, causing severe inflammation and affecting a person's ability to absorb nutrients, digest food and remove waste. It can strike people in their teens or early 20s, often affecting women more severely than men.

Talking about ostomies can be uncomfortable but the more people put themselves out there, the more normal it becomes. Blogger and vlogger Thaila Skye, for example, knew it was up to ostomates like her to break down barriers and get an open conversation started. "The lack of openness and support in previous years means that nowadays, people want to talk about their experiences in the hope that they can help others who are going through what they went through."



Hands up! Who wants to talk about incontinence?

No? Anybody? Pity, because around one in four adults can suffer from bladder problems, with women more likely to be affected than men. And when we say 'suffer', we mean it.

The physical symptoms are well known but the psychological trauma of losing control can be profound.

Take Emma Ibbetson for example. Emma knew her son's first day of school could be stressful, even dramatic. But it was far worse than she had ever expected.

Sitting with her four-year-old son, Jonah, waiting to meet his teacher for the first time, Emma began to cough.

She coughed again. And again. And then – completely involuntarily – lost control of her bladder.

Her plastic chair was wet and she was surrounded by other parents and their children. Emma did the only thing she should have: she stood up swiftly and pushed the chair under the table in the hope that nobody would notice.

Not for the first time, Emma had been embarrassed by her bladder. But even though she knew coughs, sneezes and laughter can be a trigger, there was little she could do except dread the inevitable humiliation.

Urinary incontinence tends to affect more women than men. Emma recalls suffering from short-term bladder sensitivity during pregnancy and then enduring more prolonged problems as a result of a back problem.

For anyone living with incontinence, the lack of control is a major challenge. For busy people with small families, incontinence is a living nightmare.

How do you go to work, run errands, sit through music recitals, or ferry kids from school to football practice if you cannot be confident that your bladder is up to it?



MEDICAL TECHNOLOGY IN COMMUNITY CARE

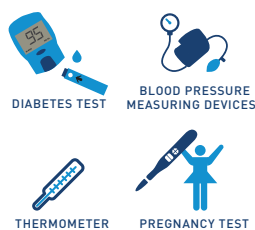
6 BROAD CATEGORIES OF MEDICAL TECHNOLOGY

PREVENTIVE



To prevent disease, injury or other conditions.
Used by citizens and healthcare professionals.

DIAGNOSTICS



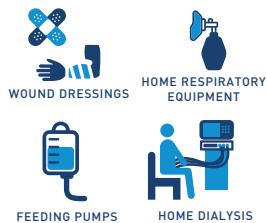
To diagnose conditions. Used by citizens
and healthcare professionals.

INTERVENTIONS



Often used outside of hospital.
Used by healthcare professionals.

THERAPEUTIC



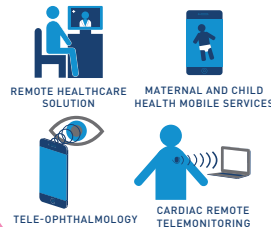
To treat patients in the home or after hospital stay.
Require support from healthcare professionals.
Used by patients and carers.

ASSISTIVE



To manage or restore bodily function.
After initial fitting patients and carers
take over the care.

MONITORING / E-HEALTH



To monitor health and transfer of health
resources and health care by electronic
means. Used by citizens and healthcare
professionals.

COMMUNITY CARE IS TREATMENT RECEIVED OUTSIDE OF A HOSPITAL

Home

General Practitioner Service

Institutionalised Homecare

- › Elderly Nursing / Care Home
- › Palliative Home
- › Psychiatric Home
- › Specialty Doctors

Out-patient Clinic / Ambulatory Care

Rehabilitation / Recovery Centre

Specialist Clinic

- › Physiotherapy
- › Podiatry
- › Optician
- › Dentist

Sale, Supply And Treatment

- › Pharmacist
- › Bandagist
- › Dispensing Appliance Contractor