Dementia patients to be prescribed smart home kit

Kat Lay, **Health Correspondent**

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The technology is designed to help patients stay in the home as long as possible GETTY IMAGES

Dementia patients will be handed prescriptions to kit their houses out with smart technology at the point of diagnosis within the decade, experts predict.

The technology, including radar to monitor their movement, robotic devices to remind them if they have left the hob on and ear-worn sensors to track their brainwaves and gait, is designed to help them to stay in their own homes as long as possible.

It could also cut avoidable hospital admissions by spotting problems before they become crises, researchers believe. Many elements are already available and relatively cheap, they said.

One hospital bed in four is occupied by someone with dementia, and admissions are often for preventable or treatable reasons such as infections, falls or dehydration.

“The system for caring for people with dementia is broken. I think most patients living with dementia and carers come into contact very infrequently with healthcare professionals. What that means is preventable problems develop,”

said David Sharp, a neurologist and head of a new £20 million research centre at Imperial College London that will develop and evaluate devices for dementia patients.

The centre, part of the UK Dementia Research Institute, will work with patients and their carers to test technology ranging from robotics to artificial intelligence in their homes.

Professor Sharp said he hoped that in ten years' time a package of technology would be available to support patients when the illness is diagnosed.

GPs might select smartphone apps to help patients track things such as sleep or concentration levels from a dashboard of those proven to be clinically useful, he said.

That could be followed by a visit from a professional to install physical sensors to track patients, and a specially designed secure hard drive, kept within the home, to which the information collected would be delivered.

Computer programmes could then spot unusual patterns that might herald the start of an infection or a decline in function, researchers said.

"Like when you are deploying your Sky box into your home — the level of technology is not that dissimilar from that level of sophistication – you might have your dementia engineer come over and deploy the technology into your home and that would provide the kind of information we are talking about," Professor Sharp said. "This may sound science fiction, but many of the elements of this are in place."

There are about 850,000 people living with dementia in the UK, more than 60 per cent of whom live in the community.

Payam Barnaghi, from University of Surrey and the deputy director of the centre, which is due to open on June 1, said that stays in hospital could distress dementia patients.

"Not only are they trying to navigate a new physical environment, they are distanced from their friends and families," he said.

"The technologies involved in this project will enable people to live independently at home whilst not sacrificing their care. Working with the latest machine learning capabilities means the technology we're using will be able to get better at spotting warning signs and events that require intervention.

“Doctors will be able to have confidence in their ability to monitor people remotely and to react quickly to any worrying changes. Improving the quality of life of people with dementia is crucial to their and their families overall wellbeing.”

The kit that will help us live in our homes for longer:

•Sensors, including some using miniaturised radar technology, can be placed around the house to check things like how frequently the patient is going to the toilet, whether they’ve made their usual morning cup of tea, or if they are becoming less active.

•Body-worn sensors can track vital signs such as heart rate, blood pressure and body temperature. Imperial researchers have developed a prototype that can be worn as a small earpiece to measure gait, brain activity and sleep. This will give doctors a fuller picture of how the patient is doing.

•Artificial intelligence programmes will scan the collected data to look for patterns, such as a raised temperature that might indicate infection, or a change in walking pattern that might increase the risk of a fall.

•Robotic devices that interact with patients living with dementia to alert them to potential safety risks such as spills on the floor or a cooker left on. They may also spot if a patient seems agitated or distressed, allowing them to alert family members or carers.

Case study

Trevor Truman is a member of the new centre’s steering committee, and principal carer for his wife, who was diagnosed with Alzheimer’s disease in 2016. He tested early prototypes of the technology that will be developed at the centre as part of a trial.

He said: “Most carers want to keep their loved one at home, safely and feeling secure for as long as possible. Having experienced over 20 individual sensors or data-gathering devices in my home, I realise technology can play an important part in achieving this aim. Some sensors automatically monitor information such as sleep patterns, room temperature or unusual movements. Others, such as those that monitor blood pressure, weight, body temperature and hydration, require input from us.

“This suite of technology allows the team to monitor my wife’s health and wellbeing remotely, and call the carer in any situation that creates concern. An

example of this was when I received a call saying my wife may need to see her GP, based on her blood pressure readings from the technology.

“When we visited the GP, we were able to take my wife’s data with us — using the app on my tablet — giving our GP an instant overview of her health and recent history relevant to the visit. New medication was prescribed that day. It was quick, efficient, and effective for us, and can be for others too.”