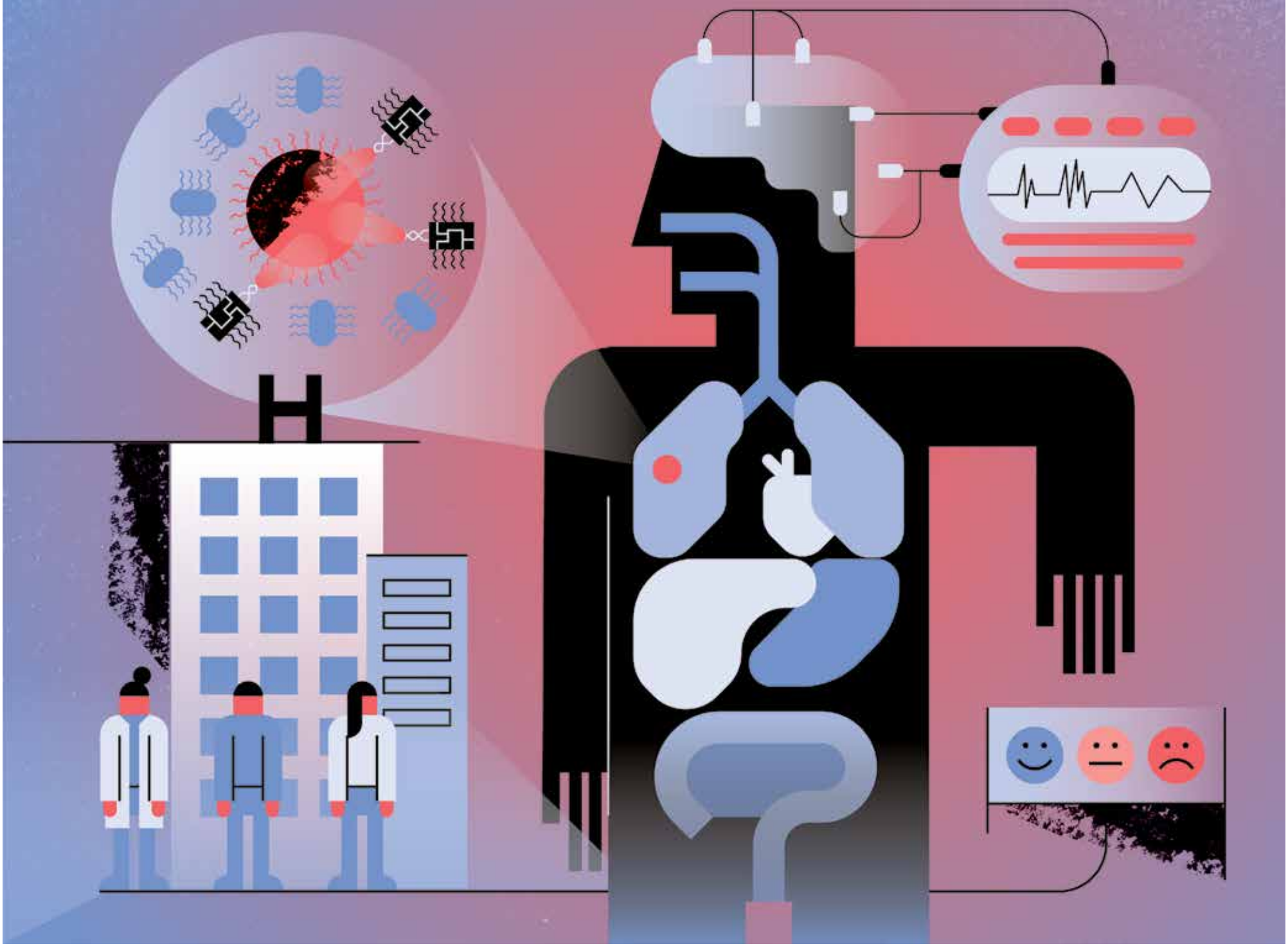
FUTURE OF HEALTHCARE



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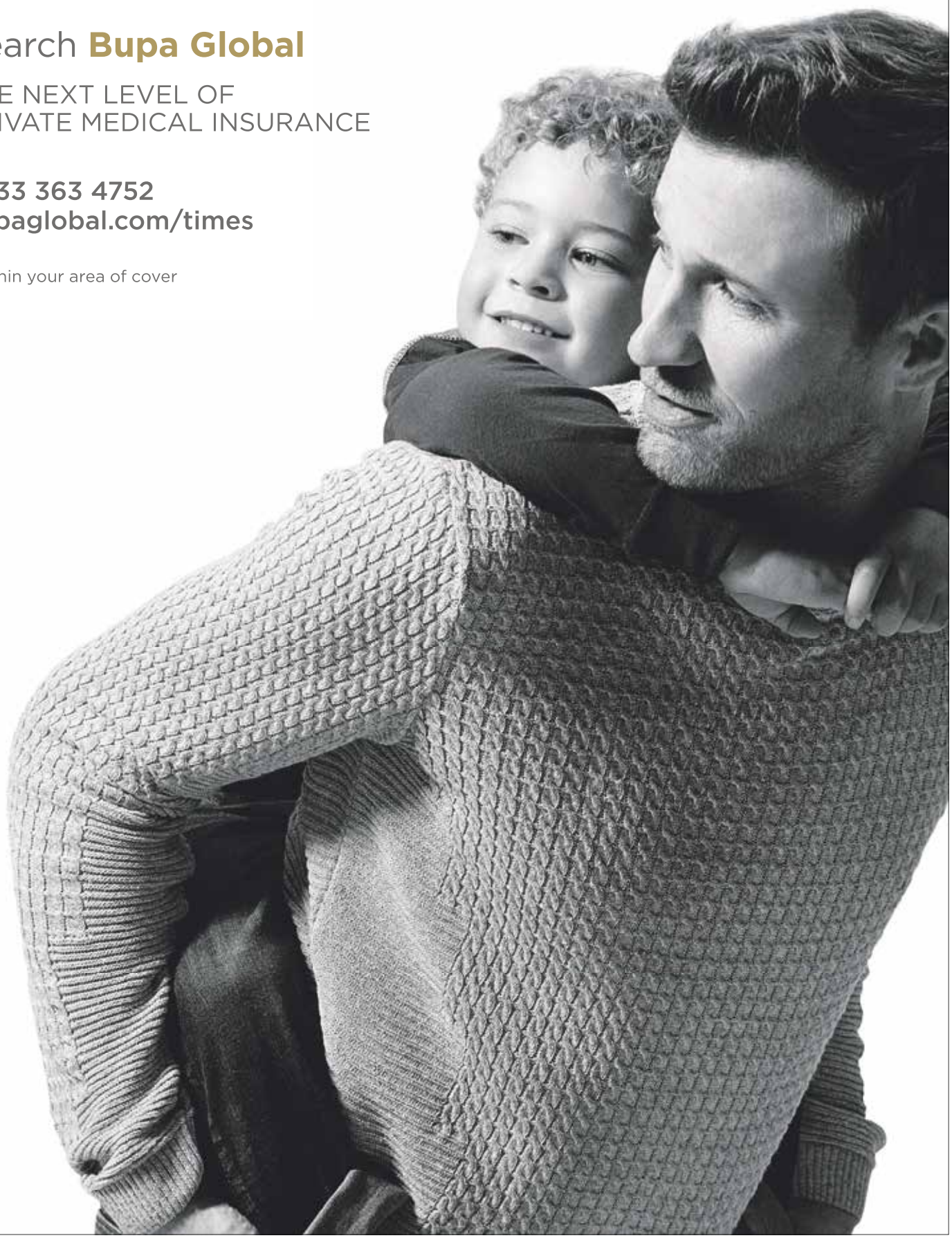

Bupa

FUTURE OF HEALTHCARE

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THE TIMES

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Gearing up to cope with old age

As the UK population ages, the need for preventative healthcare and societal change has become immediate

DANNY BUCKLAND

The triumphs of modern medicine have ushered us to an age when the over-sixty-fives are about to outnumber the under-fives for the first time in history. The most startling statistic in a generation of unparalleled advances is that when the NHS was founded in 1948, 48 per cent of the population died before they reached 65; that is now down to 14 per cent.

By 2030, around 20 per cent of people in England will be over 65 and stretching the official pension age offers at temporary barrier to the economic jeopardy flowing our way.

Today's 20 year olds have a one in five chance of living to celebrate their 100th birthday compared with their 50-year-old parents whose likelihood of reaching the milestone is one in ten. Around 20 per cent of 30 year olds will be alive into their 90s, but that venerable age is likely to be weighted with multiple chronic conditions.

The burden of cardiovascular disease, type-2 diabetes, lung cancer and dementia will only intensify with the Office for National Statistics forecasting that by 2041 the number of people aged 85 and over in the UK will double to 3.2 million.

According to Margaret Chan, former director general of the World Health Organization, old age has become "the new normal" and healthcare systems "are ill-prepared to manage diseases requiring long-term if not lifelong care".

The message was underscored by the charity Age UK's warning that although current 65 year olds can on average expect to live another 25 years, only 11 of those will be spent in good health.

The need for a new approach, based on prevention, societal change and featuring technology, is immediate.

The government's *Five-Year Forward View*, published in October 2014, states: "If the nation fails to get serious about prevention then recent progress in healthy life expectancies will stall, health inequalities will widen and our ability to fund beneficial new treatments will be crowded out by the need to spend billions of pounds on wholly avoidable illness."

But getting society to shift behavioural patterns is a holy grail that stands in a haze on the horizon. Injecting money to maintain a straining system has little chance of success so responsibility not only falls on the government, agencies and charities, but also society.


Jack Taylor/Getty Images

"With the rising age demographic comes increase number of chronic diseases such as diabetes and cardiovascular disease and that will increase the healthcare costs as people will have these diseases for longer," says Leena Alanko, a researcher at the Finnish think-tank Demos, whose *Health 2050* report advocates preventative healthcare.

"These diseases are already affecting today's society; it is not possible or even reasonable for society to provide care for everyone which is why we need a new system."

This, she adds, should include transport, housing, town planning and harness the power of technology to both diagnose and monitor health as well as energise behavioural change.

"It will be the biggest social change in history," says Aleksi Neuvonen, Demos founder. "We have a small window of opportunity and the intervention has to happen before this cohort of people get very old. Hospital care is very expensive and we have to counter that by instilling preventative health in young people and even children."

It is likely that the cavalry to save our health will need to emerge over several hills and the government's commitment to sugar tax on fizzy drinks from April 2018 is an example of one attack route.

Public Health England has also challenged the over-65s to follow "productive healthy ageing" with practical advice to improve lifestyles and keep them out of hospitals.

Health initiatives are being matched by a sweep of innovation recalibrating every aspect of our contact with health, from booking GP appointments to managing cancer at home and supporting people with complex conditions.

Lloyd Price, of the UK Digital Healthcare Council and co-founder of Zesty, an early-to-market healthcare booking app, sees promise in the vibrant technology arena.

"We are seeing a drift towards people being more responsible with their health because technology makes it easier," he says. "People can now become involved with their appointments and treatments rather than being distant and leaving it all to a healthcare professional. Changing behaviour is a big task, but there is hope."

Taunton and Somerset NHS Foundation Trust, one of twelve digital exemplar hospitals forging a blueprint for future tech-influenced care across the NHS, is piloting a number of projects including a scheme with Google's DeepMind Health aimed at delivering faster and better care via an app. The NHS is far from a sitting target.

Collaboration with technology and pharmaceutical firms is now commonplace across the NHS with the aim of improving access to treatment, streamlining systems, eliminating waste and encouraging the public to take more responsibility for its own health.

But how life will look for the battalions of 90 year olds, who will become a large population sector, depends on factors radiating across health, economics and politics and, while scientists continue to amaze with discoveries, the answers lie in more prosaic strategies that make it easier to eat healthily, walk, run and play.

The scale of the looming problem may be mountainous, but it is inspiring fresh, progressive thinking exemplified by the Institute of Mechanical Engineers' quest for better designed homes with assistive technology.

"Contrary to popular belief, our growing ageing population is becoming more tech savvy and this will only increase in the decades to come," says Dr Helen Meese, lead author of its recent *Healthy Homes* report.

The NHS was established to deal, principally, with episodic care: you fall ill, it fixes you. As it approaches its 70th anniversary, the hope is that society can prevent itself pushing this cherished institution into the history books. ◆

20%
of people in England will be over 65 by 2030

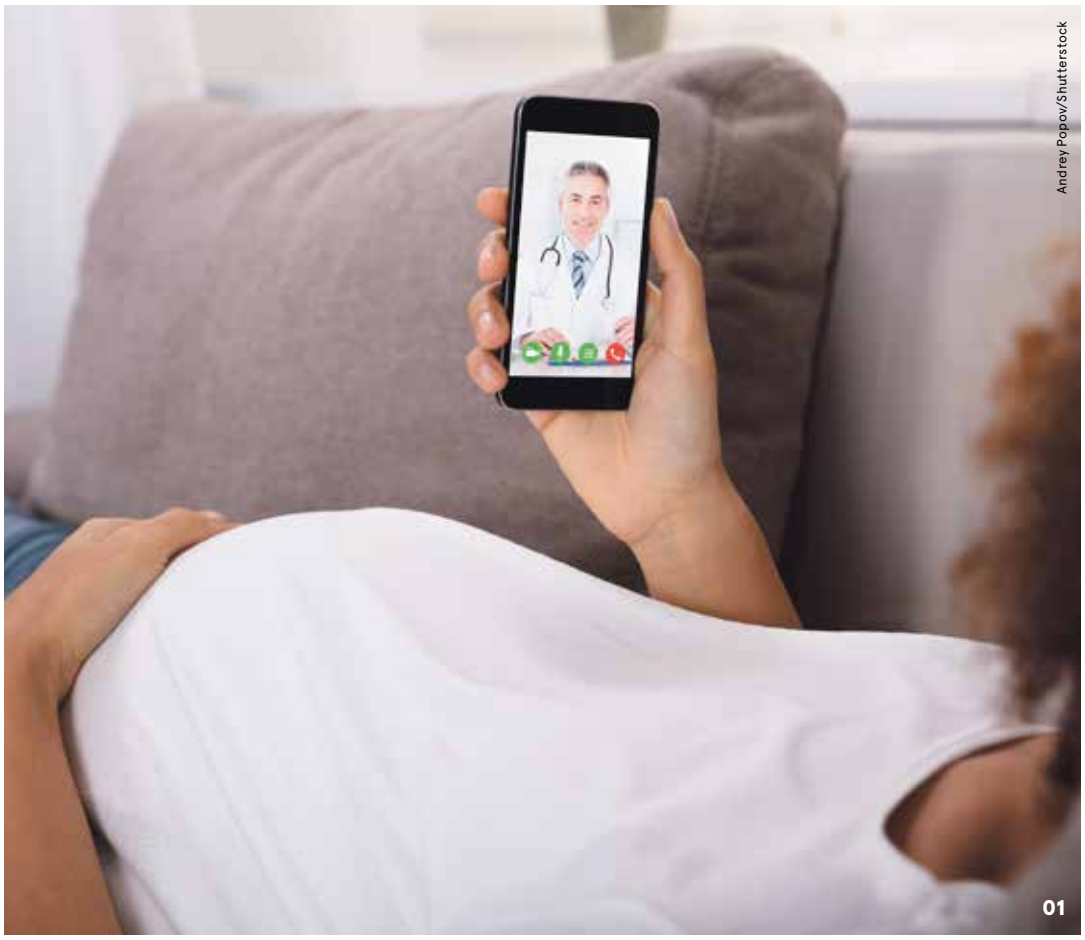
3.2m
people in the UK will be over 85 by 2041, double today's number

1 in 5
chance of 20 year olds living today reaching the age of 100

PATIENT-CENTRIC CARE

Putting patients in control of their health

Development of digital technology is helping to deliver personalised treatments which involve patients in their healthcare


Andrey Popov/Shutterstock

01


Joan Cros/NurPhoto via Getty Images

03

JACQUI THORNTON

When Yorkshireman Tony Green was struck down with sudden chest pain aged 57, he thought he was having a heart attack. He called an ambulance, but despite quick treatment and a hospital ECG scan, doctors could find nothing wrong.

The next two years were a frightening time, as Tony, a Sky TV investigations consultant now living in Glasgow, suffered frequent similar attacks.

He says: "It was very scary – the attacks were coming at regular intervals without any warning, the pain was getting more intense and to be out of control is a horrible way to live."

Tony was finally diagnosed using a new credit-card sized heart monitor called a KardiaMobile, which records the electrical activity of his heart through his fingertips.

He was found to have atrial fibrillation, an irregular heart rhythm disorder, which was not being picked up in hospital tests because of its transient nature. Finally, he was put on effective treatment.

> **This involves a shift from patients being passengers to drivers of their health, with responsibilities too**

Tony, now 60, says he feels normal again and is actively involved in his healthcare, carrying the KardiaMobile everywhere. "It's really easy; you open the app on your phone and put your fingers on the pad – that's how simple it is. You just email the readout to your GP or, in my case, my cardio consultant," he explains.

Since February, the device is now being rolled out as part of an NHS England-funded project, via the country's Academic Health Science Networks and is one of the latest examples of patient-centric technology that is set to transform healthcare in 2018.

Francis White, vice president of makers AliveCor, says it enables patients to capture and understand their own health information, in this case heart rhythm, wherever they are, which is empowering.

He says: "We involved patients from day one, working with the Atrial Fibrillation Association in the UK. We gave them hundreds of devices so their members could give us feedback and that learning was unbelievable powerful for us."

Patient-centred healthcare is about patients being involved in decisions about them, rather than something that is done to them by a doctor. This involves a shift from patients being passengers to drivers of their health, with responsibilities too.

Patient-centric technology is about creating tech designed very much with the patient in mind and how they are going to use it. Both are deeply wrapped up with the concept of individualised, personalised treatment and care.

Dr James Somauroo, former NHS anaesthetist and critical care doctor, founded accelerator company HS, with three other colleagues, which builds and scales healthcare startups.

To be considered, candidates have to show evidence of patient centricity. Successful applicants include Qdoctor, a telehealth service for NHS GPs, which enables clinicians to provide continuity of care for their patients with video consultations in and out of hours, and XenBot, a chatbot which boosts mental health by helping people journal their thoughts through introspective questions.

AliveCor

02

Dr Somauroo says: "I firmly believe that healthtech startups and companies need to be connected with patient groups from the get-go. It is vital that health companies focus early product development around building something that patients love to use, and that offers a convenient and effective way to improve their health.

"Any product which directly affects the patient should be built with patient-centric feedback and development at its heart."

Patient-centric healthcare is gaining momentum on a range of levels, making healthcare more comfortable, more convenient and more accessible, thanks to feedback from ordinary people.

For years, women have complained that the breast compression needed for mammograms can be painful. Now a new pain-free ultrasound screening method is being developed in the UK to detect breast cancer, which would eradicate the need for compression.

In terms of convenience, repeated hospital visits for chronic conditions are a bugbear. To combat this, Lancashire Teaching Hospitals NHS Foundation Trust has teamed up with video-conferencing experts Polycom to enable kidney patients living in a 100-mile radius to have home dialysis treatment via a video link. After appropriate training, nurses supervise remotely and can zoom in on procedures and provide the highest level of expertise.

The new system gives patients, who previously had to travel miles several times a week for lengthy treatment, more freedom as well as the chance to collaborate and be engaged in their treatment.

Patient centricity is not limited to treatments or interventions. Plymouth Hospitals NHS Trust is working with networking experts Aruba to help enhance patient experience by making sure they have access to the internet, which ultimately will help to improve care.

Despite a "hostile" environment for internet connectivity, with 12 uniquely shaped floors and massive amounts of pipework and electrical equipment, Aruba has enabled an extensive wired and wireless system for staff, visitors and patients. This means that 2,500 mobile devices are connecting every day, with around 70 per cent of the wifi used by patients.

The trust also has 250 iPads around the site, set up for patients to take the "Friends and Family" test on whether you would recommend loved ones to be treated there, information that is then being fed back to improve services.

Experts agree that with the proliferation of digital technology and demand for personalised treatment, a focus on patients will make the difference between success and failure.

Dave Challis, vice president of health innovation at consumer giant RB, says that as the health market becomes saturated with products offering similar services, many emerging solutions will disappear as fads. But he concludes: "Those that deliver real benefits to consumers and are truly patient centric will succeed." ◆

01
Virtual consultations with doctors are now commonplace, with a variety of apps enabling patients to videolink directly with GPs, without the need to visit a surgery

02
AliveCor's KardiaMobile app and medical-grade ECG empowers customers to detect an abnormal heart rhythm and share the information with their doctor

03
Motorola's Vital Moto Mod is a snap-on extension to the Moto Z smartphone that measures heart rate, respiratory rate, body temperature and both systolic and diastolic blood pressure

Commercial feature

Moving the dial from illness to wellness worldwide...

We are living in a world where people expect access to premium healthcare and the best medical experts, when and where they require it – whether that's at home or abroad

Most of us are more health conscious than ever and increasingly look for a true healthcare partner, offering an holistic solution to our needs. That move from illness to wellness has been embraced by Bupa Global and its customers.

"For many, wellness is a daily, active pursuit, which incorporates mental and physical as well as emotional health," says Dr Søren Carstens, head of clinical operations at Bupa Global. "It means not only living longer, but thriving too.

"These days, our customers are using their health plans to take control of their wellbeing through a rich spectrum of benefits, whether that's GP appointments, advice and assessments, regular dental check-ups or even acupuncture. They are no longer just using their plans for when they're unwell, but for maintaining their health. Of course, if they do fall ill, Bupa Global will be with them every step of the way, providing access to premium healthcare where and when they need it."

Bupa Global truly is an international health insurance company. It has a presence around the world, including in London, Brighton, Miami, Dubai, Copenhagen and Hong Kong. And its customers are able to be assessed and treated almost anywhere in the world, at their convenience, depending on their plan coverage.

"Our customers choose Bupa Global so they can receive treatment when and where they need it," says Neil Kirby, marketing director at Bupa Global. "They are what we call 'globally mobile and globally minded' citizens: people who want premium coverage and access to the healthcare they need anytime, anywhere in the world, whether that's in the city they live in or when studying, living, travelling or working abroad.

"We've had customers fall ill in China who we've taken to Singapore to be treated by the world's best specialists. Others have travelled from Botswana to South Africa for a second medical opinion, or are customers in cities and want access to private GPs or direct access to specialists.

"With the largest global network of direct providers to choose from, you can see how we make this a seamless experience as there is no hassle with payment and claims."

Indeed, Bupa Global offers this richness of cover worldwide. Customers can take advantage of a wide range of benefits to stay healthy and access an extensive network of advisers, doctors and nurses around the world, which allows the organisation to provide a multilingual, 24-hour telephone service, seven days a week.

Furthermore, Bupa Global acknowledges that the solution to health problems is not always black and white, and therefore it offers customers the opportunity to receive a second opinion on their medical diagnosis from a panel of world-class specialists.

Additionally, customers can access a health check once a year, which is included in their plan. This is a quick-and-easy way for customers to invest in their health, through a personalised examination and quality time with a doctor. Health assessments can be conducted globally, and customers can also access a range of other medical checks and tests.

Prevention is better than cure, is the attitude. Bupa's annual MOTs analyse each customer's lifestyle and current health. Depending on your level of cover, in-depth tests are performed to detect potential issues, including heart problems and cancers, and tailored advice and follow-up support is offered to improve overall health and fitness. There is even access to an individual online portal where customers can view their results.

Some 80 per cent of customers change their lifestyle habits following Bupa health assessments and 60 per cent say they are able to deal better with stress.

Dr Carstens adds: "If you had an expensive car, you'd service it every year to keep it running smoothly. We should treat our bodies and minds with the same consideration; when it comes to health, it pays to be proactive rather than reactive."

For more information about Bupa Global's range of health plans or to get a quote please visit Bupaglobal.com/times or telephone 0333 363 4752. If you're interested in hearing more about Bupa Global for your business, telephone 0333 363 6814. Health assessments can be accessed after ten months as a Bupa Global customer

"We make this a seamless experience as there is no hassle with payment and claims

80%
of customers change their lifestyle habits following Bupa health assessments

60%
say they are able to deal better with stress

'Bupa's health assessment cured me of FOFO'

Oliver Pickup was apprehensive ahead of his health assessment, but following thorough testing and expert advice, he no longer suffers from a fear of finding out

You have probably heard the acronym FOMO: fear of missing out. Well, when it comes to health issues, I suffer from FOFO: fear of finding out. And I'm not alone. So when I was invited by Bupa Global to have a health assessment, I accepted with a tinge of apprehension. What if the doctor discovered there was something wrong?

It is this mindset, and the putting off of check-ups, that Bupa Global is attempting to transform, here and abroad. The focus ought to be on wellness rather than illness; prevention trumps cure. Hence why the international health insurer offers its customers this annual MoT, which can be performed almost anywhere in the world, depending on which plan they have.

On the eve of my appointment, at the Bupa Health and Dental Centre Canary Wharf Crossrail, in east London's financial district, I completed a thorough medical questionnaire. This informed the medics about historical ailments, current concerns and health goals, thus ensuring there was no inefficiency when I made my visit.

My health adviser cheerily greeted me before performing a raft of tests in the first hour. Weight and height were measured, urine and blood checked, and my blood pressure monitored using gold-standard equipment that straps around both arms, not just one. If the two readings are vastly different the customer has an ECG to check the heart.

Body fat was then measured, followed by a musculoskeletal examination, during which the health adviser recommended some simple and welcome exercises to loosen my stiff shoulders, tight hamstrings and hip flexors.

In the second part of the assessment the doctor talked soothingly and in great detail about the test results and performed a general check. Pointers on how to improve my diet and lower my slightly high cholesterol were provided, as well as an in-depth personalised report. Two follow-up calls rounded off the incredibly reassuring experience.

Good news: I'm healthy. The doctor assuaged all my health worries and I'm determined to make tweaks to improve my diet and exercise routine. Even better: I've been cured of FOFO.

The health assessment was covered by the Bupa Global Premier Health Plan; health assessments differ depending on your level of cover

3D PRINTING

Tilly Lockey, who lost both hands to meningitis as a baby, with her a custom-built 3D printed prosthetic

Adding a new layer to medical care

Technological advances look set to make 3D printing the most rapidly evolving technology in medical research, with the potential to transform healthcare

MARTIN BARROW

Tilly Lockey was a baby when she lost both hands after developing meningitis. Almost a decade later, Tilly made headlines when she received new hands created with a 3D printer, as the world's first clinical trial of a new type of prosthesis gathered speed within the NHS in Bristol.

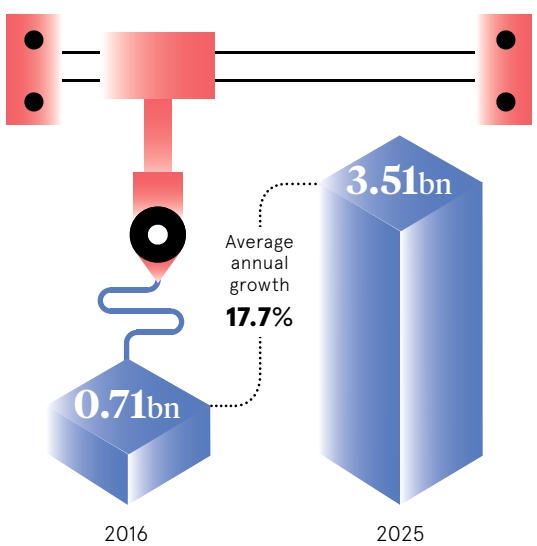
Tilly's hands, based on Disney characters, took just one day to make. The lightweight design by Open Bionics, a UK firm, uses a 3D printer to create the hand in four separate parts, custom-built to fit the patient using scans of their body. Sensors attached to the skin detect muscle movements, which are used to control the hand and open and close the fingers.

The hands cost about £5,000. That compares with around £60,000 for currently available prosthetics with controllable fingers, which makes them too expensive for young children as they are growing up. 3D printing has provided a solution that simply didn't exist until a year or two ago.

In Belfast, NHS surgeons turned to 3D printing when a lifesaving transplant threatened to go catastrophically wrong.

Pauline Fenton, 22, was living with end-stage kidney disease and was wholly reliant on dialysis. Her father William was confirmed to be a suitable living donor. However, the discovery of a potentially cancerous cyst on William's donor kidney meant an already complex procedure would have an extra level of difficulty.

Global medical 3D-printing market



Transparency Market Research 2018

As the cyst would first require treatment before the transplant could proceed, surgeons at Belfast City Hospital made the decision to use a 3D-printed replica model of the donor kidney, printed from his CT scans.

This allowed the team of surgeons to ascertain the size and placement of the tumour and cyst, so the surgical team could plan and prepare for the surgery to remove the cyst and transplant the kidney to the patient.

Tim Brown, consultant transplant surgeon, says: "As surgeons, we are highly trained and skilled at what we do, but by having a 3D print of the patient's anatomy in my hand, I get an extra level of understanding that just isn't possible with 2D or 3D images on screen. In this case, I could plan the surgery in detail, considering the best approach, as well as the potential problems, before stepping into the operating theatre."

What, precisely, is 3D printing? Also known as additive manufacturing, it is the process of creating a three-dimensional object from a digital file. It is called additive because it generally involves building up thin layers of material, one by one. The technology can produce complex shapes that are not possible with traditional casting and machining methods or subtractive techniques.

It is also cost effective, which is critical when other healthcare costs are rising inexorably. This is because the process of additive manufacturing enables items to be assembled directly from a digital model, increasing precision and removing room for error. Traditional manufacturing techniques usually rely on removal, by cutting or drilling, incurring waste and extraction costs which 3D printing avoids.

> **"3D printing is still in its infancy, but its positive impact is already being felt**

3D printing is still in its infancy, but its positive impact is already being felt, particularly in healthcare. Its development is opening up endless possibilities for healthcare systems and reframing the debate about sustainability and access to care. Just as the NHS is exploring its potential, so too are healthcare providers around the world. And the healthcare industry, from manufacturers of medical devices to big pharma, is redirecting strategic thinking to embrace 3D.

Small wonder that growth prospects for 3D printing are so strong. A report by Transparency Market Research, the business analysts, forecasts growth of around 18 per cent a year in the global 3D medical devices market to reach $3.5 billion by 2025.

Until now, and for the foreseeable future, growth has been driven by demand for 3D-produced

orthopaedic and cranial implants, and dental restoration. Digital dentistry, in particular, is bringing rapid transformation. High-speed desktop printers are extremely accurate and deliver a smooth surface finish for crowns and orthodontic models, which can be created on site, reducing the need and cost of dental laboratories.

3D printing has the potential to hasten personalised care because it enhances the ability of clinicians to provide highly customised products and treatment that is far more accurate than was possible previously.

A number of barriers must be overcome to realise the full potential of 3D printing in healthcare. As often is the case, the regulatory environment has not kept up with rapid technological advance, which means health systems are not always equipped to approve 3D-printed products. The risk of patent and copyright infringement remains a concern, and there is a shortage of technical expertise in healthcare.

The relatively high cost of 3D printers is an issue, although the emergence of an unprecedented number of small and medium-sized 3D-printing technology companies is creating an increasingly competitive business environment.

The market is also witnessing a surge in collaboration initiatives as established healthcare and medical devices companies focus on incorporating innovative technologies in their operations to attain sustainable profits and remain competitive.

Recently, Philips signed an agreement with the 3D-printing medical devices companies Stratasys and 3D Systems in North America to support its progress in the field of patient care and strengthen its clinical experience.

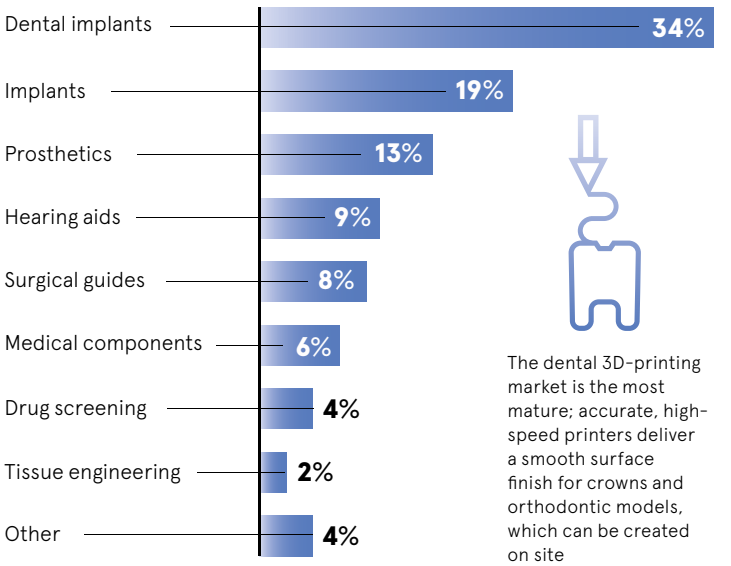
North Manchester General Hospital has established its own 3D-printing laboratory, within the NHS, in response to the increased demand for 3D services. The lab's main cases are head and neck cancer patients who require reconstruction, including the use of bone grafts to reconstruct the upper or lower jaw. With new resources provided, the lab is taking on smaller cases and it may even be used in the orthopaedics, neurology or rheology departments.

Technological advances in 3D-printing materials and strategic collaboration among industry players appear set to make 3D printing the most rapidly evolving technology in medical research, with the potential to transform the healthcare landscape in the near future.

Increasingly, 3D printing will become embedded in everyday activities, from helping surgeons to improve success rates in complicated procedures to producing pills in new shapes with variable release rates. As far as healthcare is concerned, the future really is 3D. ◆

Healthcare 3D-printing market

Market share by revenue*



The dental 3D-printing market is the most mature; accurate, high-speed printers deliver a smooth surface finish for crowns and orthodontic models, which can be created on site

*Percentages do not equal 100 due to rounding

IndustryARC 2017

Case study

Artificial organs

The rapid development of 3D-printing technology has raised hopes that one day human organs could be reproduced, helping to cut through long waiting lists for transplants. While the ability to print whole organs is still at a distance, significant progress has been made.

For example, experts have already developed 3D-printed skin for burn victims and airway splints for babies with tracheobronchomalacia, which makes the tiny airways around the lungs prone to collapsing.

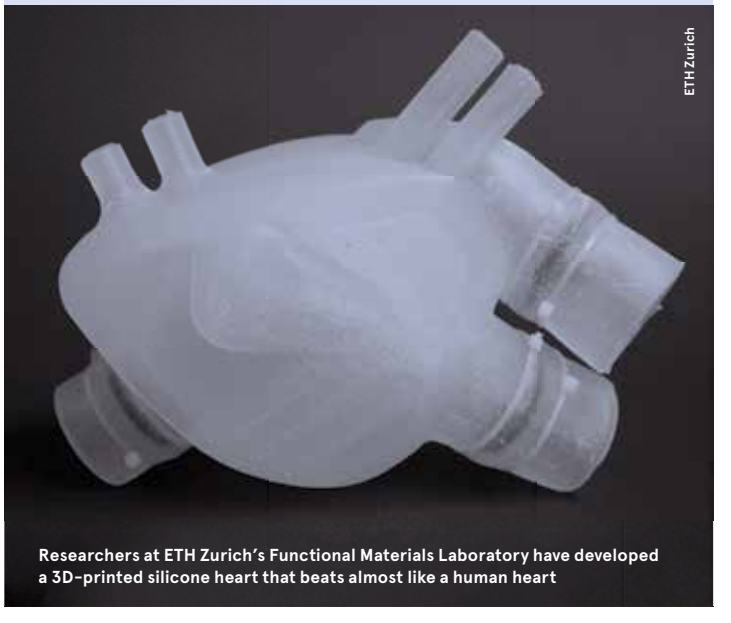
Scientists at Princeton University have used 3D-printing tools to create a bionic ear that can hear radio frequencies far beyond the range of normal human capability, in a project to explore the feasibility of combining electronics with tissue.

Researchers are also exploring ways to print tissues of the liver, the most regenerative organ in the body. Organovo, a US company based in San Diego, has developed a bioprinting process that takes cells from donor organs and turns this into a printable bioink.

Experts believe that bioprinting could be used to create functioning organs for implantation within ten to twenty years. This will raise profound ethical issues, not least around the risk of reducing human life to a manufacturing process.

In addition, the high cost of creating artificial organs, at least in the technology's early days, risks exacerbating health inequalities by making such transplants available only to those with the ability to pay.

The technology is not yet at the level required to bioprint an entire organ. As the public's awareness of the capabilities of 3D printing grows, so too will these ethical concerns. For the time being, 3D printing's pioneers are mostly off the radar.



ETH Zurich

Researchers at ETH Zurich's Functional Materials Laboratory have developed a 3D-printed silicone heart that beats almost like a human heart

Commercial feature

More stroke patients to get new lifeline

A life-saving clot-grabbing treatment could soon be made available to more stroke patients in the UK

Time window to treat stroke

0 hours | 3 hours | 6 hours | 24 hours

7½ hours Average time from onset of symptoms to admissions across England, Wales and Northern Ireland[1]

Before the DAWN Trial™, there was no proven treatment option in the late treatment window*

Available treatment options
- Clot-busting drugs
- Stent retriever thrombectomy

Available treatment options
- Stent retriever thrombectomy

9/10 patients in the 6 to 24-hour time window were disabled or dead with medical management alone[2]

48.6% of patients in the 6 to 24-hour time window remained functionally independent at three months after stent retriever thrombectomy[2†]

1. UK Stroke Association. http:// stroke.org.uk. Accessed March 15, 2018.
2. Nogueira RG, Jadhav AP, Haussen DC, et al.Thrombectomy 6 to 24 hours after stroke with a mismatch between deficit and infarct. N Eng J Med. 2018;378:11-21.

* Treatment option is currently not available in all countries.
† n=107

NHS England has set ambitious targets to improve stroke survival rates. Its strategy includes wider access to mechanical thrombectomy, a procedure used to remove a blood clot in a patient's brain. Utilising a small device known as a stent retriever, a tiny stent-shaped medical device that is inserted into the blocked artery in the brain, the device ensnares the blood clot and removes it from the body.

In April 2018, the NHS will begin commissioning 24 neuroscience centres in the UK to receive reimbursement and funding to perform mechanical thrombectomy procedures. Currently only a few hundred patients a year receive the treatment and just a handful of hospitals in the UK offer it, despite its proven benefits.

The procedure can produce remarkable results, with patients who may have otherwise been disabled, capable of leading independent lives. Annually, about 8,000 people who have an ischemic stroke may benefit from the expansion in the number of hospitals offering mechanical thrombectomy.

> **"This is a highly significant development in the treatment of a catastrophic health event, in which every minute counts**

‘All stroke patients should have access to a thrombectomy’

A leading specialist is calling for stroke patients throughout England to get treatment which could save their lives and avoid long-term disability

Tufail Patankar
Consultant interventional neuroradiologist
Leeds General Infirmary

8k

ischemic stroke victims a year will benefit from the expansion in the number of hospitals offering mechanical thrombectomy

This new approach aims to capitalise on the rapid technological innovation in the field of stroke care, bringing new hope to thousands of men and women who suffer strokes every year, improving the quality of life for stroke survivors.

At the forefront of this change in stroke care is Stryker, one of the world’s leading medical technology companies. Emerging evidence from the Stryker sponsored DAWN Trial™ on mechanical thrombectomy and its benefits in terms of recovery from stroke and quality of life are providing important clinical data and supporting other initiatives focused on the development of stroke-care pathways around the world, including the UK.

About 48 per cent of patients treated with the Trevo device in the six to twenty four-hour window were functionally independent at three months, compared with only 13 per cent of patients treated with medical management alone. Carlos Pena, director of neurological and physical medicine at the FDA, said: “Healthcare providers and their patients now have better tools for treating stroke and potentially preventing long-term disability.”

The DAWN Trial™ compared 107 patients treated with the Trevo Retriever and medical management to 99 patients who received only medical management. In the DAWN Trial™ nine out of ten patients who did not receive thrombectomy were either dead or disabled 90 days after their stroke.

Until now, mechanical thrombectomy devices like the Trevo Retriever were only cleared for use up to six hours from symptom onset, leaving a significant population of stroke patients ineligible to receive treatment because they arrived at a hospital that doesn’t treat stroke or outside the treatment window. The DAWN study and its findings open up that potential treatment window for patients up to 24 hours. We are living our mission to make healthcare better. However, every minute still matters in stroke treatment. It is still imperative for all caregivers in the stroke treatment pathway, from emergency medical services to emergency room physicians to neurologists and interventionalists who do the procedure, to continually improve the speed in which they can deliver fast and efficient treatment of stroke. With stroke, every minute counts.

For more information please visit stryker.com

stryker

The DAWN Trial™ has increased the urgency for transformation in stroke care in England, according to one of the country’s leading stroke specialists. Dr Tufail Patankar says the DAWN Trial™ sponsored by Stryker has shown that ischemic stroke patients can make a good recovery up to 24 hours after first symptoms of a stroke, limiting the risk of long-term disability, if they have timely access to the right care.

Dr Patankar, consultant interventional neuroradiologist at Leeds General Infirmary, says the health service is responding too slowly to improvements in our understanding of stroke. The consequence of this is avoidable loss of life, while many survivors of stroke are left with a level of disability that could have been prevented.

He is calling for all stroke patients to have access to a thrombectomy. Currently only a few hundred patients a year receive the treatment and just a small number of hospitals in England offer it, despite its proven benefits.

The procedure can produce remarkable results, with patients able to walk out of hospital within a few days of having it.

Dr Patankar says: “NHS England has announced improvements and change is coming. But it is very slow and we are still at the planning stage. The DAWN Trial™ shows us what is potentially possible for patients up to 24 hours after the onset of stroke symptoms, although this treatment option is not available in all countries. But we are still trying to put in place appropriate care for patients within six hours.”

> **If we can intervene at the right time, and under the right conditions, we can make a profound difference**

Many areas of England are unable to provide 24-hour care for stroke patients. “Leeds is one of the better centres for stroke care. “We treat between 40 and 50 patients a year. But the reality is that we should be treating between 240 and 250 patients. That leaves a lot of patients who are being failed,” he says.

Dr Patankar says he is grateful to companies such as Stryker for supporting vital research to broaden the understanding of stroke care. “We are learning that with the right care you can save lives and improve the quality of life for people after a stroke. If we can intervene at the right time, and under the right conditions, we can make a profound difference.

“Achieving these standards of care requires upfront investment. But in the longer term this will be recovered through savings for the NHS and social care. Stroke patients can go on to make a positive contribution to society. We reduce the burden of care on their families, who are able to continue working instead of taking time off for caring responsibilities.

“This has been recognised across Europe and we have a responsibility to build on their learnings to create an effective stroke service for our own patients.”

Document number AP-002058 v1.0

* Treatment option is currently not available in all countries.

VALUE-BASED HEALTHCARE

Patient power has become the new cry

Moving from volume to value-based healthcare is not without its challenges, but puts patients' wellbeing first

JOHN ILLMAN

Imagine two new patients in an accident and emergency (A&E) department. The first is kept waiting for three hours fifty-nine minutes; the second for four hours one minute. Would the most critical patient be treated first?

You would assume so. But A&E departments are financially penalised for breaching targets. They must make clinical decisions about 95 per cent of emergency patients within four hours; for example, by deciding whether to admit or discharge them.

Once a patient breaches the target, by waiting more than four hours, the system gives busy emergency departments a perverse incentive to focus on patients who have not breached it.

This is said to distort clinical priorities and to be a classic example of a system which puts too much emphasis on target or volume-based care and not enough on value-based care. Volume-based healthcare provides measures which evaluate care according to numbers of patients treated and treatments administered.

The value-based model, which puts the overall needs of both the individual and overall populations at the centre of the picture, has evolved out of a global collaboration led in the UK by Professor Sir Muir Gray, a humorous Glaswegian once described by a former chief medical officer as "one of the most creative minds in British medicine", and in the United States by Professor Michael Porter of the Harvard Business School. Author of the prize-winning *Redefining Healthcare*, Professor Porter also wrote a pivotal paper in *The New England Journal of Medicine* calling for a switch from volume-based to value-based care.

The term value-based care has created confusion, not least among healthcare professionals. Some have dismissed it as a trendy new phrase or management gobbledygook. But ever-increasing numbers of doctors believe that it could be as important to healthcare as Steve Jobs and Bill Gates have been to computing. Sir Muir says: "It will be as critical as evidence-based medicine."

He and his distinguished Harvard colleague are united in their concern that ignorance is perhaps healthcare's biggest challenge.

Sir Muir, who helped to create NHS Choices and the National Library for Health, explains: "What is the right level of prescribing of antidepressants in any given area? We just don't know."

A report by the Academy of Medical Royal Colleges, *Protecting resource, promoting value: A doctor's guide to cutting waste in clinical care*, says: "Estimates suggest that around 20 per cent of mainstream clinical practice brings no benefit to the patient as there is widespread overuse of tests and interventions."

LEFT
Dr Rupert Dunbar-Rees says a big challenge for value-based care is persuading healthcare professionals that they can identify relevant outcomes from patients

85%

of patients in accident and emergency (A&E) were seen within four hours in the second quarter of 2017/18, well below the 95 per cent target

33%

increase in the number of A&E attendances since 2004, which stood at six million in the second quarter of 2017/18

Nuffield Trust/Health Foundation 2018

While Sir Muir's main focus has been populations, Professor Porter's has been individual patients. According to his report in *The New England Journal of Medicine*: "Value in healthcare remains largely unmeasured and misunderstood."

Is this really true? Are we failing at this most basic level, even though global health spending is projected to reach nearly $9 trillion by 2020 compared with $7 trillion in 2015?

Dr Rupert Dunbar-Rees, a former NHS GP, and founder and chief executive of Outcomes Based Healthcare, says: "We are very good at spending money on doing things, at operating on people and prescribing tablets. But we are quite weak at knowing whether it has made any difference whatsoever. Has it really impacted someone's life? Is their quality of life better? Is their mobility better? Their pain?"

These are critical questions for both patients and clinicians. One of the defining trends of modern healthcare has been the growing involvement of patients in their own wellbeing. With the spread of healthcare information via the internet, the emergence of powerful patient advocacy groups and general awareness of healthy living, the patient has ceased to be just a passive recipient. Political correctness and consumerism is said to have consigned old-style paternalism to the sidelines and made "patient power" the new war cry.

But how much power do patients actually have? What is happening now suggests that patient power has been extremely limited, for example to changes in emphasis in individual relationships between doctors and patients. They are now perhaps more likely to decide together what to do for the best.

In contrast, value-based healthcare is potentially far more radical. It is putting the patient at the forefront of the healthcare planning process. UK patients have been working alongside healthcare professionals to determine the outcomes they want from their own healthcare. Positive outcomes are defined as any change for the better in a patient's health, such as being able to walk again after a bad fall or feeling in control again after a bout of mental illness.

In one innovative programme, Camden Clinical Commissioning Group (CCCG), in north London, ran an "outcomes party" for 55 elderly patients, relatives, clinicians and volunteer organisations. This established that their top priority, especially among patients and families, was time spent at home and not in hospital.

Reporting in *The New England Journal of Medicine*, Dr Caroline


Hero Images/Getty Images

Political correctness and consumerism is said to have consigned old-style paternalism to the sidelines and made 'patient power' the new war cry

Sayer, then CCCG chair, says: "When they told us, 'time spent at home', we designed care with that patient-defined goal in mind. Focusing on a single, clearly understood goal, defined by patients and embraced by all involved in their care, created powerful clarity of purpose across a complex range of providers and organisations. Our experience shows the potential for a patient-defined outcome to drive the collaboration needed to integrate care."

Integrated care is a hallmark of the value-based model. The tragic case of Julia shows why. Writing in *Heart BMJ*, Dr Dunbar-Rees and colleagues reported that Julia had suffered from high blood pressure, heart failure and a heart rhythm abnormality, which increased her risk of stroke. She then had a stroke. While in hospital she was also diagnosed with chronic kidney disease.

Incredibly, within just one year, she had more than 80 appointments with consultants, specialist nurses and other healthcare workers. But she felt progressively unwell. Due to lack of co-ordination or single clear responsibility for her overall care, it was not picked up until Julia eventually visited her GP a year later that she had late-stage lung cancer.

Heart BMJ comments: "If Julia had received integrated care with her at the centre, rather than care in silos, it is much more likely that her diagnosis of lung cancer would have been made earlier and might not have been fatal. Her experience of care would also have been better."

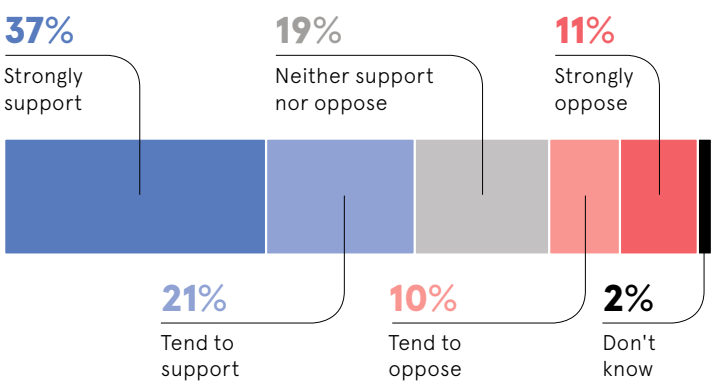
Dr Dunbar-Rees says one of the big challenges for value-based care is persuading healthcare professionals that they can identify relevant outcomes from patients. "They say that it's all too abstract or nebulous to use as the basis for commissioning a service," he says.

"Designing a service to deliver 250 hip or knee replacements each year is a far more concrete task than designing a service to restore people's mobility, independence and confidence. But experience shows that the latter can be achieved by identifying groups of people with similar needs." This was the basis of the Camden success.

What of the future of volume and target-based care? Targets will continue to hold people to account and measure progress, but value-based healthcare holds the promise of a more sensitive approach towards health policy planning. The four-hour rule is at best a blunt instrument, a finger-in-the-air measurement of a highly complex system, but it has its place. ◆

Public support for removing the four-hour rule in A&E

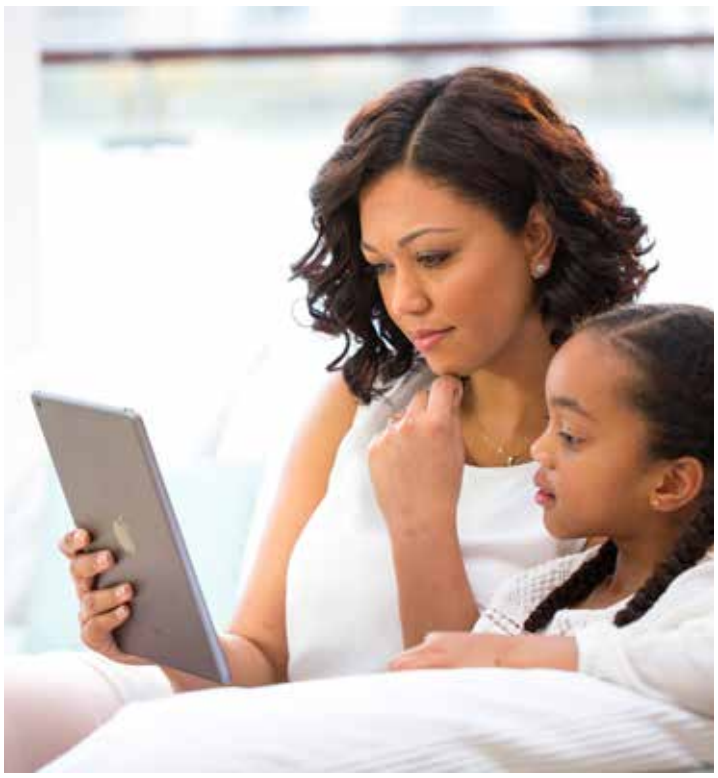
Survey of more than 1,000 adults aged 18 and over



Ipsos 2017

Linking patients with medical care

A new online advice and appointments system is reducing pressure on stretched NHS GPs



How often did you visit your doctor last year? Once, twice? If you're anything like the average patient, it was six or seven times, three times the frequency of 20 years ago. Fast forward and traditional general practice (GP) services are being squeezed by pressures from a growing and ageing population living with more illnesses.

GPs are having to do more with less, leading to early retirement matched by fewer entries to general practice each year. Patients are equally frustrated. A recent report from NHS Digital revealed satisfaction with GP services fell to 65 per cent, the lowest level in the 35-year history of the *British Social Attitude Survey*. Among the 29 per cent of respondents who were dissatisfied with the NHS in 2017, a majority put this down to long waiting times, lack of funding or a lack of staff in the NHS.

"Primary care is fractured and is in a perfect storm of surging demand and a shortfall in numbers. The result is that GPs are seeing more people, but have less time with those who need additional attention," says Keith Nurcombe, sales and marketing director of DoctorLink, a new online tool that provides 24/7 symptom advice and appointment booking for patients, and which launched last October, following 16 trials across the NHS.

"Meanwhile, patients find it increasingly difficult to see their GP and may have to wait two to three weeks for an appointment. This is bad for the system overall as it forces people into A&E or a walk-in centre, where the NHS and the taxpayer incurs great cost."

Through administrative and clinical efficiencies, GPs are gaining up to 20 per cent of their time, as the DoctorLink system gathers adoption across the NHS. The innovation, which uses proven secure clinical algorithms, assesses a person's condition and, where appropriate, gives patients the opportunity to self-manage their condition or seek advice from pharmacists instead of joining GP surgery waiting queues. It is able to release around 844 hours a year at a surgery with a 7,200-strong list, creating an annual cost-saving of £27,041.

Keith Nurcombe
Sales and marketing director
DoctorLink

The system helps and supports local GP surgeries to deliver a better service and answers a significant healthcare need

"The return on investment is primarily in time, as 20 per cent of patients using DoctorLink are well enough to look after themselves or see a pharmacist without needing a doctor's appointment," says Mr Nurcombe.

"DoctorLink is not about replacing the GP's hands-on approach or pushing patients away; it's about helping people understand if they actually need to go to the surgery and for the doctor to understand how quickly a patient needs to be seen, based on the responses to a robust series of medical questions.

"If you have 50 people booked in to a morning's surgery, but could responsibly remove ten of them, it creates time which could be used differently and the GP can best decide how to use that time.

"DoctorLink will always default to symptoms with the highest acuity if there is possibility of two or three diagnoses. It shares the information with the GP in advance, which can lead to much shorter consultation time as the doctor will already have a view of what treatment is needed."

The trials have proved popular with surgery administration and reception staff by significantly reducing the volume of calls and number of patients trying to squeeze on to the appointments chokepoints of Monday morning and Friday afternoon. Beversbrook Medical Centre in Wiltshire piloted it for four months among its 7,000 patients and reported positive feedback from clinicians, staff and patients.

"It is encouraging to see how the service has already begun to alleviate the pressures on NHS services," says managing partner Emmy Butcher.

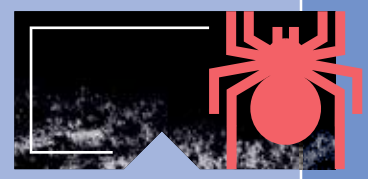
"The system helps and supports local GP surgeries to deliver a better service and answers a significant healthcare need," Mr Nurcombe concludes.

For more details please visit www.doctorlink.com

doctorlink

WEARABLE HEALTHCARE TECH

Phobia treatment



Virtual reality is being used to treat a variety of phobias. With the help of psychologists, 360-degree videos place the user in different levels of anxiety scenarios, encouraging them to practise relaxation techniques to manage their fears

Artery de-clogging

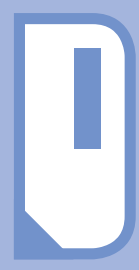
The **Max Planck Institute for Intelligent Systems** has developed a robotic caterpillar that could revolutionise minimally invasive medical procedures. The ingestible, 4mm rubber "millirobot" houses tiny magnets enabling it to "walk, crawl and roll", and could one day be used to deliver drugs to specific parts of the body or clean out clogged arteries

Stress-busting headband

InteraXon, the company behind the **Muse** "brain-sensing headband", wants to make meditation easy. Used with an app and headphones, the headband guides your breathing through changing sounds of weather based on the real-time state of your brain to reduce symptoms associated with stress, depression and anxiety, and improve focus

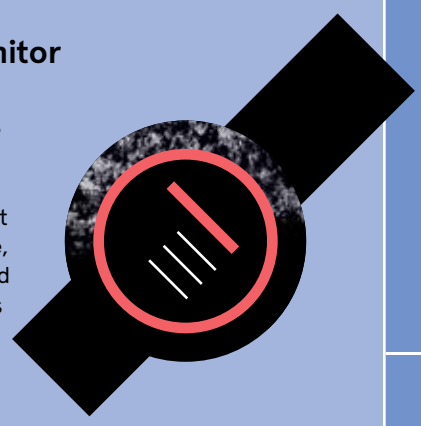
Intelligent thermometer

TempTraq has developed a 24-hour smart thermometer that continuously senses, records and sends alerts to parents whose children are unwell. The sticky patch sits under the arm and monitors temperature round the clock so carers can detect changes in fever and sickness



Blood-pressure monitor

Omron HeartGuide is a medical-grade blood pressure tracker, with an inflating band to take a oscillometric measurement like you'd expect at the GP's surgery. The device, which can also be programmed to take readings at night, syncs to an app and can be shared directly with a doctor

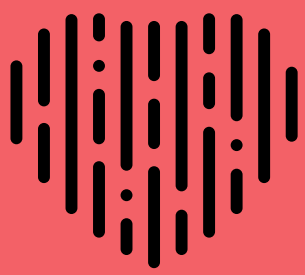


UV sensor

L'Oreal's **UV Sense** is a mini adhesive UV sensor to help people track how much time they spend in the sun. At only 2mm by 9mm, the near-field communication device can be worn on a fingernail or stuck to a pair of sunglasses

Irregular heartbeat check

The latest update to the **Apple** Watch now includes the ability to detect atrial fibrillation, a common abnormal heart rhythm that can increase the risk of stroke. Using green LED lights flashing hundreds of times per second and light-sensitive photodiodes, the built-in heart-rate sensor gathers signals to isolate heart rhythms from other noise



$0.9bn

global wearable healthcare market in 2017

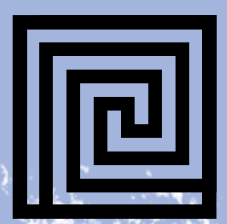
$17.8bn

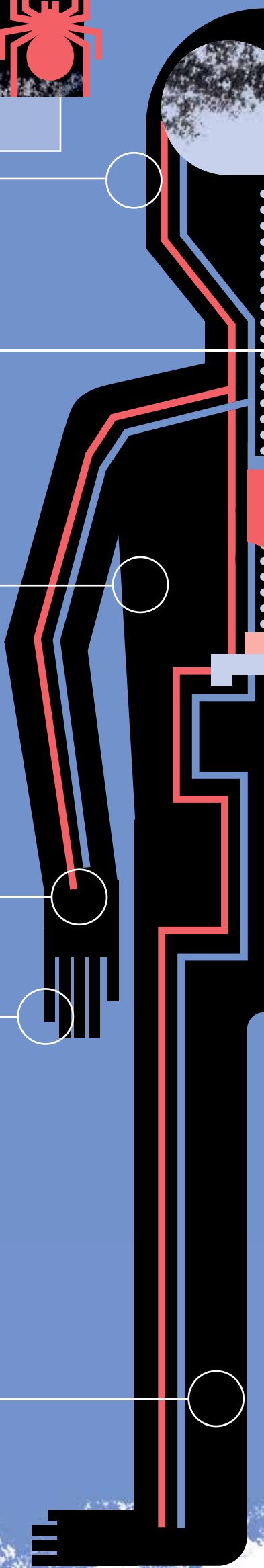
industry in 2021

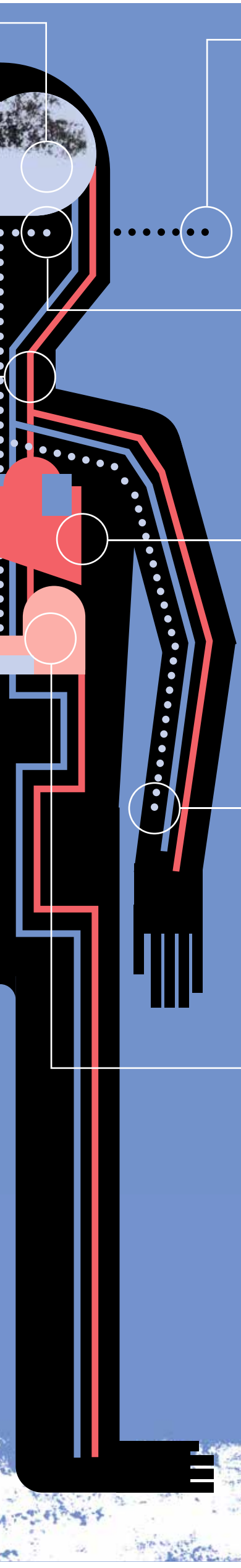
Tractica

Smart tattoos

Researchers at **Harvard** and **MIT** have developed a way of embedding health sensors into human skin using smart tattoo inks that change colour according to the chemistry of the body's interstitial fluid. Meanwhile, researchers at the **University of Illinois** have worked out a way of embedding flat, flexible electronic sensors into temporary tattoos to monitor electrical signals produced by the heart, brain and muscles





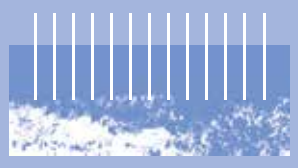


Smart contacts

Needleless blood-sugar monitoring could soon be a possibility, with scientists working on a smart contact lens to **measure glucose levels using tears**. Google threw its hat into the ring in 2014 by launching its own connected contact lens research project, though a regulatory-approved product is still yet to make it market

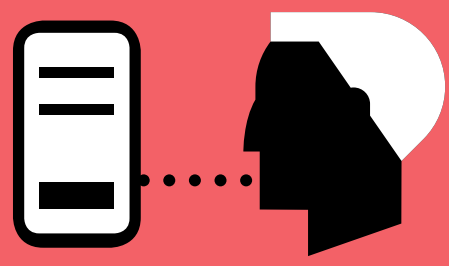
Smart insulin patches

For many patients with type-2 diabetes, maintaining a consistent level of insulin is a daily struggle, full of finger pricks, injections and a strict diet. Researchers are developing **wearable microneedle patches** that are able to monitor glucose levels and autonomously administer insulin directly into the blood, or administer drugs to stimulate the pancreas to release more insulin



Virtual doctors

2017 saw an influx of **virtual consultations with doctors**, as a variety of apps were launched to videolink patients directly with GPs, without the need to visit a surgery



Wearable ECG

QardioCore is a wireless electrocardiogram (ECG) aimed at improving detection and monitoring of cardiac conditions with minimal disruption to daily life. The lightweight band sits around the chest and doesn't have the wires and sticky patches of a conventional ECG

Implantable wearables

Ingestible sensors offer new insights into patient health patterns and medication treatment effectiveness, according to the world's first digital medicine company **Proteus Digital Health**. Proteus Discover is a microscopic sensor that activates on contact in the stomach and links with a patch worn on the torso to monitor the impact medication is having. Results are then shared with healthcare providers to determine the appropriate action

62%

of consumers agree that wearables will put people in control of their own health

58%

agree that wearables with feedback and alerts will provide personalised care

60%

agree that wearables will lead to healthier lifestyles

Survey of smartphone mobile broadband users across the globe

Ericsson 2017

90%

of consumers would be willing to share personal data from a wearable device or app with a doctor

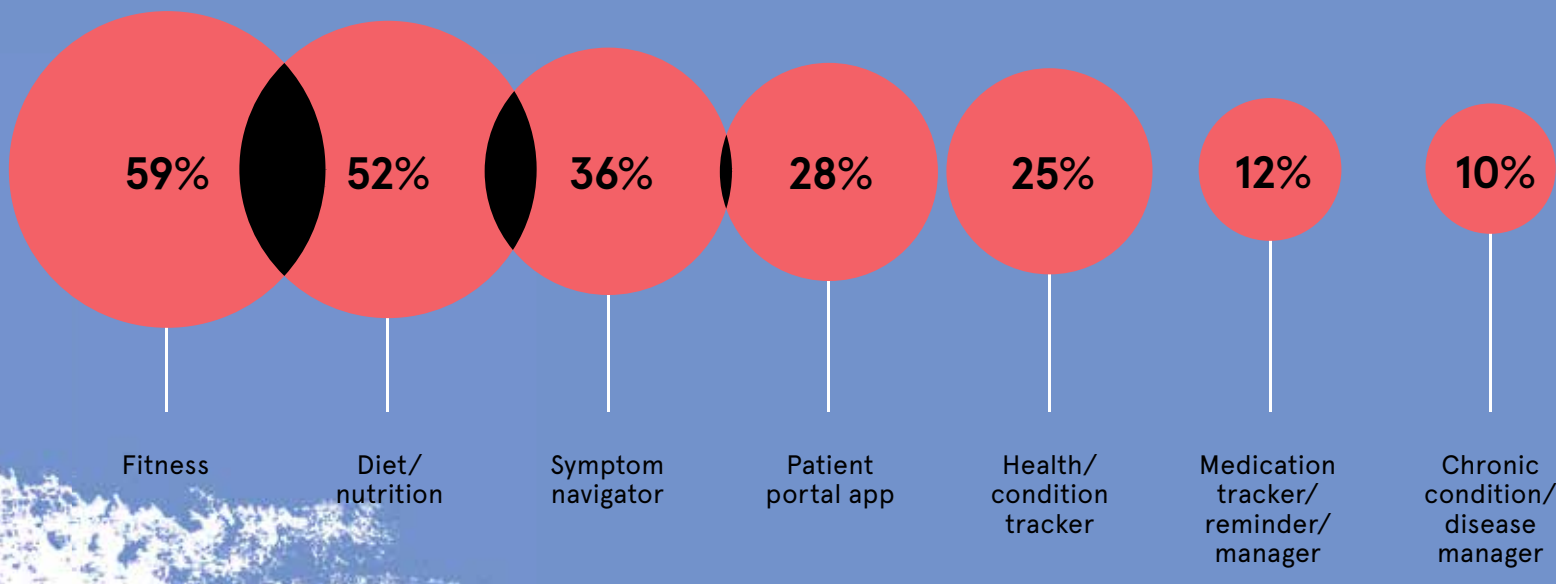
63%

would be willing to share data with their health insurance provider

Accenture

Most popular healthcare apps

Percentage of global app users that use the following



OPINION COLUMN

‘It’s time the NHS recognised the potential of medical technology’

The NHS is creaking under the strain of an ageing population, a growth in costly long-term conditions and mounting budget deficits. As the health service emerges from its toughest winter yet, when seasonal illness again clashed with growing demand, it’s time to recognise the potential of medical technology to help manage the crisis.

The headlines over the winter made grim reading for health secretary Jeremy Hunt and NHS managers: non-urgent operations postponed; mounting staff shortages; worse than feared budget deficits. To cap it all, research has found public satisfaction with the NHS in sharp decline.

The future doesn’t look much brighter either. The NHS’s own *Five-Year Forward View* predicts a funding gap of £30 billion by 2020 between anticipated demand and what the service can deliver. In response, a savings target of £22 billion has been set, however the service is struggling to come anywhere close to achieving it.

The impact of ill-health extends far beyond the health service, yet this often goes under-appreciated. Sickness, absence and worklessness linked to illness among people of working age cost the UK economy more than £100 billion a year. Lost earnings add up to £4 billion annually, while the Treasury shells out health-related benefits to over 300,000 people.

Meanwhile a growing army of carers – now one in eight adults with numbers swelling by 6,000 a day – often give up their lives as well as their opportunity to contribute financially to the UK economy.

So how do we balance these challenges with the need to control healthcare spending? Better patient education, patient self-management and preventative medicine are part of the solution. But 70 per cent of the NHS’s £125-billion annual budget is currently spent on treating people with long-term conditions. Keeping these patients out of hospital and returning them to work and the community must be the number-one priority.

The irony is that a solution, in the form of existing medical technology, is already available. Sadly though, technology’s potential to help solve the NHS’s budget issues, reduce the burden of ill health on the UK economy and improve patients’ lives is often overlooked.

There is little or no mention of medical technology in most of the 44 Sustainability and Transformation Partnerships’ proposals. Meanwhile commissioners often limit access to technologies. The Medical Technology Group’s research found vast disparities in neighbouring NHS trusts and a clear inequality between access to technology for patients in the North, where it is generally better, and those in the South. The postcode lottery, it seems, is very much alive and well.

Yet, taking just eight existing treatments, including implantable cardiac defibrillators, hip replacements, fibroid embolisation and quicker diagnosis of sepsis, we found savings of nearly £500 million and better outcomes for around 250,000 people could be achieved.

The trouble is that medical technology is wrongly perceived as a cost driver. By limiting access, commissioners see an opportunity to reduce short-term spending in favour of treatments that cost more over the long term.

Overcoming these barriers won’t be easy. It requires a radical change in culture and practice. Not only that, but the whole life-cost of treatments, not just the initial investment, as well as the impact on the wider economy, need to be factored in.

Half a billion pounds in savings from these eight treatments is just the tip of an enormous iceberg. Not just a financial one, but a social one, where patients and carers can regain their independence, and lead full and active lives. It’s time the NHS recognised the potential of medical technology to deliver that.

Barbara Harpham
Chair
Medical Technology Group

No panacea for medical data-sharing

Health services need to improve data-sharing for better patient care, treatment and research outcomes, but whether blockchain is the right facilitator remains to be seen

HEIDI VELLA

Data can be the lifeblood of the NHS. As John Bell, regius professor of medicine at Oxford University, remarked in the government's life sciences industrial strategy: "One of the most important resources held by the UK health system is the data generated by the 65 million people within it."

However, collecting and securely distributing patient information is a global healthcare challenge. Medical data typically flows from many different directions, with records kept as a mishmash of electronic and paper files scanned to a computer.

Obtaining patient consent to share data can be difficult, especially in the UK where many different physical legal entities operate under the NHS umbrella. And a lack of standardisation in note-taking is a major problem for interoperability across different workflows.

As a consequence, although it is improving, access to data for patients and clinicians is far from frictionless and can result in poor care.

A recent study by York, Manchester and Sheffield universities found that around 237 million medication errors are made in England annually, causing at least 1,700 hospital patient deaths. Mistakes often occur due to a lack of information or because of communication errors.

The rise in digital health solutions and the bourgeoning role of artificial intelligence in disease diagnosis and preventative care has put a renewed onus on data management and sharing, but finding the right tools is problematic.

In the United States, which has an inexplicably complex healthcare system, some companies and organisations are looking to blockchain to manage this information.

American startup SimplyVital Health's Connecting Care platform uses blockchain to facilitate sharing of patient records between providers from different clinical affiliations. The notes are not stored on the chain, but can be accessed from it. Whenever records are accessed, this is shown in the blockchain, creating an immutable audit trail.

Kat Kuzmeskas, the company's chief executive and co-founder, says blockchain is good for transactions, immutability and security, but it is not good for storing chunks of data as it can't hold enough, only mere megabytes, whereas one X-ray alone is several gigabytes.

"However, it can open up access to data without having to turn it over to someone," says Ms Kuzmeskas. In America movement of medical records is a 'business issue not a tech issue', she adds, because to get paid, doctors need to prove they co-operated with other physicians in sharing information. Therefore, there is a clear incentive to create an audit trail of data-sharing.

MedRec, which is being developed at the Massachusetts Institute of Technology, further aims to link patients and providers to the addresses of existing remotely stored medical records using blockchain. Estonian-based Healthureum is targeting Indian healthcare with a similar platform that also securely consolidates medical data.

The US Center for Disease Control and Prevention is exploring the technology for public health surveillance, including using it to manage data more efficiently during a crisis. The centre thinks blockchain's inherent security could be used to store and share data records faster during a pandemic, while complying with security and privacy laws.

Without the financial incentive, the use-cases for blockchain in UK healthcare seem less obvious. Yet Shaun O'Hanlon, a former GP and now chief medical officer at EMIS Group, a major provider of healthcare software services in the UK, believes it could be used as a record of patient consent.

"A major challenge for data protection is to make sure patients have given permission to access their data," says Mr O'Hanlon. "An unconscious patient may arrive in A&E and doctors won't know if they are allowed access to their medical records. Blockchain could be a way to define consent in one place with a proper audit trail."

Furthermore, it could be used as a record for patient care to identify mistakes and liability. In 2016, the Royal College of Physicians found that tens of thousands of patients were having "do not resuscitate" orders imposed without consent.

"This requires an audit trail to make sure the doctor has recorded things properly and hasn't changed or edited it," says Mr O'Hanlon. "This is very important legally to protect the integrity of records and blockchain is ideal as we will know who recorded, accessed or deleted something."

Blockchain is deemed secure because information submitted to the chain cannot be erased or edited and only people given permission can access the chain. The information stored, however, is distributed and some are actually concerned about the lack of a central administrator.

"Most people like the concept of a trusted central authority," says Professor James Batchelor, director of the Clinical Informatics Research Unit at Southampton University. "As patient data is not stored in the chain, it becomes a mere reference to an individual, pointing to another system, so the point of principle is lost."

He adds that it could solve problems in the future. "But as it stands now, I think it would be a struggle to implement and use it in any meaningful way," says Professor Batchelor.

Blockchain technology is still nascent and there are problems with scalability. Transactions cost fractions of a penny, but the computing and electrical power needed is at present unsustainable at scale, according to Ms Kuzmeskas. However, she is confident this issue can be overcome, adding that the technology is essentially in the "dial-up stage".

But, as Mr O'Hanlon concludes: "If there is a strong enough business case, it will happen eventually." Although blockchain is almost certain to take off in private healthcare and the most modern systems first.◆

Chris Ryan/Getty Images

01


SimplyVital Health

02

01
Collecting and securely distributing patient information is a global healthcare challenge

02
Kat Kuzmeskas, chief executive and co-founder of SimplyVital Health, says blockchain can open up access to data without having to turn it over to someone

16%

of healthcare executives had solid plans to implement a commercial blockchain solution in 2017

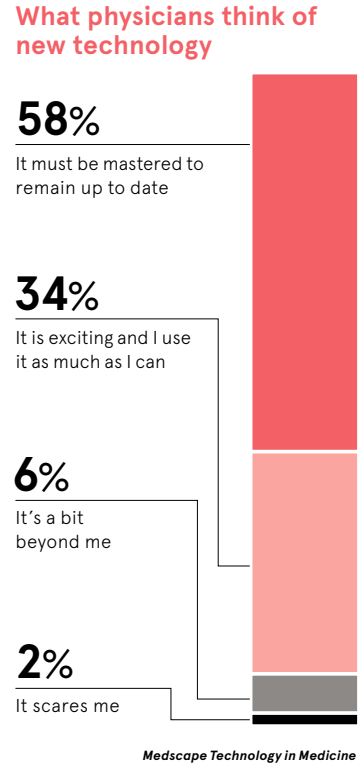
56%

expect to implement by 2020

IBM 2017

> **Whenever records are accessed, this is shown in the blockchain, creating an immutable audit trail**

Commercial feature



Medscape Technology in Medicine

Why meaning should drive digital tech innovation

The technology revolution is causing major disruption in almost every industry – and certainly in health and medicine

Most physicians, who tend to be cautious by nature, are sceptical about the relevance of many technology innovations in their day-to-day practice, and with good reason.

The rate of innovation, from digital health wearables to artificial intelligence (AI), has been explosive, but for the vast majority of physicians this rapid-fire pace has not been met with a significant level of practical, sustainable applications.

It may be "buzz-worthy", but if the new product or platform doesn't deliver as promised, or isn't relevant to the physician's work, then chances are it hasn't addressed a simple question: does the technology support physicians in delivering care to patients?

It is in this space where Medscape puts its focus. With more than two million active users globally, Medscape is among the largest platforms for news, clinical information and education for physicians, providing updates on leading-edge medical and technological advancements, innovative immersive physician learning solutions, and digital tools to enhance the point-of-care experience.

Separating "fluff" from meaning

The impact of technology in medicine is clearly being recognised in clinical care. The US Food and Drug Administration (FDA) recently approved an AI algorithm that helps patients get data from their smartwatch to support an accurate diagnosis for atrial fibrillation, and there are new digital technologies to support the treatment of eye diseases and managing blood pressure and diabetes.

Physician crowdsourcing is becoming an essential resource for physicians looking for advice and insights from colleagues around the world. And virtual reality (VR) and AI have the power to enhance a physician's learning experience, thus boosting the potential to apply leading-edge clinical information to improve patient outcomes.

Medscape's insight-led innovation

With meaning, value and relevance driving the development process, Medscape sees technology from the users' and learners' perspectives, focusing on the product impact and leveraging those insights to help determine the tools that it creates. Medscape's most recent innovations support physicians in making accurate diagnoses and treatment decisions, with the potential to reduce unnecessary testing and improve care.

Medscape Consult™ is a powerful solution that allows physicians to ask and answer clinical questions, and share and discuss clinical challenges from colleagues around the world at the point of care. It wasn't enough to give doctors another social media community; instead Medscape provides a moderated environment with editorial oversight, expert authors and reviewers for selected content, and partnerships with leading physicians' professional organisations.

Physicians told Medscape that the value of the platform would lie in its clinical utility, its practicality, simplicity and rigour as well as community, and it has delivered often ahead of medical news headlines.

A case in point concerned the outbreak of the Zika virus, which sparked intense discussion on the Medscape Consult platform after a Brazilian paediatrician posted a question regarding an unusual spike in cases at his clinic of microcephaly, a birth defect in infants exposed to the virus in utero. With insights from physicians on the platform, the physician confirmed that the cases were likely to be linked to Zika, more than a week before reports from international health agencies.

Medscape Education, meanwhile, is constantly developing innovative approaches to improve the physician learning experience, with immersive solutions that engage and challenge physicians, while driving increased retention and improvements in recognising and optimally treating disease.

Offering alternatives to darkened lecture halls and traditional conference presentations, a new suite of learning technologies and tools leverage the impact of virtual patient simulation. With VR and AI technologies, this replicates the realism and unpredictability of actual practice through case-based scenarios, with data showing that Medscape's platforms have the potential to improve physician diagnosis and treatment for a range of conditions, including diabetes and HIV.

Additionally, other Medscape Education applications include Learning Labs, which are small group "mixed reality" or VR experiences; Virtual Clinical Practice, which simulates real-world skills training, and online platforms that enable clinicians to access immersive content anywhere using a variety of personal VR headsets.

Technology may be driving significant changes in society and the potential to improve medical outcomes is unquestionably great, but its greatest potential may lie in bolstering clinical care knowledge and insights, while strengthening the real-life human bonds between physician and patient.

For more information please visit medscape.com

Medscape®

Top digital health advances

Dr Eric Topol, editor-in-chief of Medscape, professor of genomics and renowned expert on the future of healthcare, selects some of the top digital tools shaping medicine

Smartwatch diagnosis of atrial fibrillation

In November 2017, AliveCor announced it had received FDA approval of an algorithm for its watch band with a built-in ECG sensor. KardiaBand, when used with an Apple Watch, tracks a person's heart rate-to-physical activity ratio, through several days of data capture. When an outlier reading is captured, showing a heart rate considerably outside what would be expected for the person's activity, he or she gets an alert to record their ECG. A pdf of the reading can then be sent via the individual's smartphone. This represents the first FDA-approved artificial intelligence (AI) algorithm to aid consumers in obtaining data for a medical diagnosis.

Improved continuous glucose sensors

Both Abbott and Dexcom have introduced new FDA-approved glucose sensors that are user friendly. Abbott's FreeStyle Libre Flash is easily applied on the arm and does not require fingerstick calibration. The Dexcom sensor, typically applied on the abdomen or arm, sends blood glucose values to a smartwatch and smartphone, while Libre has a small dedicated receiver. With recent FDA approvals, these sensor readouts can now be used directly to dose insulin, contrasting with the historic reliance on fingersticks.

Blood pressure watch

Omron, the most popular home blood pressure device manufacturer in the United States, has FDA approval for the first smartwatch that takes a blood pressure reading via a brief occlusion of the radial artery. In January, the latest version of the device was unveiled at CES 2018, the annual electronics trade show held in Las Vegas, Nevada.

> **With meaning, value and relevance driving the development process, Medscape sees technology from the users' and learners' perspectives**

Do 'happy pills' really make things better?

"Doctor please, some more of these" moaned Rolling Stone Mick Jagger on the 1966 track *Mother's Little Helper* as a generation turned on to the prescribed drugs deemed to blunt the corrosive impact of modern life. Fifty years later and 64.7 million prescriptions for antidepressants were handed out in 2016 by doctors in the UK, but debate rages over how effective they are

DANNY BUCKLAND

For

A major study, published in *The Lancet* last month, analysed data from 522 trials involving 116,477 people over six years old and found 21 common antidepressants were all more effective at reducing symptoms of acute depression than dummy pills. The study could open the GP's surgery door for around a million people who need support, but have been reluctant to use antidepressants, claim experts.

Depression, which affects around 350 million people worldwide, has been described as "the single largest contributor to global disability that we have – a massive challenge for humankind" by John Geddes, professor of epidemiological psychiatry at Oxford University.

Only one in six people with depression receive effective treatment with GPs "squeamish" to prescribe medication for mental health conditions, he adds.

"We have a wealth of evidence that antidepressants do a good job for some people, and there are a lot of people who could benefit from them and now will," says Professor Carmine Pariante from the Royal College of Psychiatrists.

"This study should reassure people who are suffering from depression, but who are currently not seeking help because maybe they don't trust antidepressants as a therapeutic option."

He says that about 50 per cent of patients will respond to their first antidepressant and about 75 per cent are improved by other antidepressants, while around 25 per cent do not find benefit from any of them. But the sheer scale of the research gives huge weight to their efficacy.

Professor Pariante, who is based at King's College London, says claims that the research was skewed by pharmaceutical companies were unfounded and evidence of overprescribing was lacking.

"The important thing to remember is that antidepressants should only be prescribed to people who need them; those who have a clinically significant depression impairing their quality of life and putting their lives at risk from potential suicide," he says.

"There are people out there who do need antidepressants, but they are not seeking help or they cannot access help. Should we be worried about people being prescribed them who don't need them? It is an important question, but the guidelines are clear and we have to trust the clinicians.

"While we must respect the people who have serious side effects, there is a risk-benefit that we accept with other drugs, yet we are much more critical about antidepressants.

"Antidepressants help most people, not all people, but this research clearly shows that these drugs do work in lifting mood and helping most people with depression."

50%

of patients will respond to their first antidepressant medication

NHS Digital

Against

Prescriptions for antidepressants have hit an all-time annual high with NHS Digital recording a 108.5 per cent increase on the 31 million pharmacies dispensed in 2006.

"They are just doled out and people are not made aware of the side effects, and that they may never be able to come off them," says campaigner Katinka Blackford Newman, author of *The Pills That Steal Lives*.

"The study [published in *The Lancet*] is flawed in many ways because it focuses on people who have improved after eight weeks, but no one takes antidepressants for just eight weeks. A number of things might make us feel better, but it doesn't make them an effective cure for depression.

"It also looks at clinical depression when the vast majority of antidepressants are given to people going through a divorce, stress at work or their dog has died."

Ms Blackford Newman, a mother of two and an award-winning documentary film-maker, was prescribed antidepressants after her marriage break-up and claims they took her to the brink of suicide and into a mental health unit. She detailed the fight to reclaim her life in the bestselling book.

"People need to know what the side effects are and be aware that 59 per cent of people will suffer serious sexual side effects. You may also have to give up work to come off them. Of course, there are people who are clinically depressed and antidepressants have been proved to be effective, but are they right for those who are anxious, which is the majority of those five million people currently taking them in the UK?

"Our feelings are a marker to tell us to do something, so numbing yourself with antidepressants isn't going to be particularly helpful. If you are anxious about your finances, why would you want to be numbed about it? Anxiety is a really important tool that tells us that something is wrong and we have to do something."

109%

increase in prescriptions for antidepressants since 2006

NHS Digital

David Healy, professor of psychiatry at Bangor University, says: "The benefits are real, but they have been overhyped. They are being overused and the harms have been hidden. Primary-care doctors and their patients would be more reluctant to use them if they had been told what all the risks were."

Professor Healy believes GPs have been educated to view anxious patients as being depressed. "This has led to a huge mushrooming of the use of these drugs and 80 per cent of people are on them for more than a year primarily because they cannot get off them," he says.

"We know they are highly addictive and have serious sexual side effects, and that people suffer terribly when they are trying to get off them and can even have enduring side effects after they come off them." ◆

OPIOIDS

Feeling the pain of an opioid crisis

Prescription and illegal painkillers are wreaking havoc in the United States, so how can the UK avoid an escalating opioid crisis?

JOSHUA NEICHO

Americans consume some 80 per cent of the world's prescription opioids. The country's opioid habit is linked by the US national health statistics agency to a two-year drop in life expectancy – a warning to the UK which is now seeing prescriptions and opioid-related deaths rocket.

US opioid overdose deaths – from prescription painkillers and illegal narcotics – doubled from 21,088 in 2010 to 42,249 in 2016, the last year for which figures are available.

What former US Congressman Patrick Kennedy calls a "human addiction tsunami" can be traced to the marketing drive for OxyContin in 1996, which also boosted prescriptions of numerous other opioids. The view emerged at the same time that pain should be considered a fifth vital sign, leading doctors previously wary of opioids to question whether they were denying patients compassion.

Americans prescribed morphine-based drugs for an injury or agonising back pain, for example, became hooked, although it is now known opioids are ineffective in most cases of chronic non-cancer pain.

The United States faces a "triple-way epidemic", worst in states such as Ohio, as young pain sufferers who struggle to get a long-term opioid prescription turn to heroin and all ages migrate to highly potent synthetic fentanyl bought online. The pattern is divergent: a spike in heroin deaths, emergency room visits for opioid overdoses up 30 per cent in 14 months, but a decrease in opioid prescribing since 2010.

The UK has opioid-related deaths at a fraction of the US level – 2,038 in England and Wales in 2016 – but rising sharply, more than doubling from 2012 to 2015. Prescriptions have almost doubled from 2007 to 2017. Fentanyl, very rarely prescribed in the UK and only thought to have arrived as a street drug in 2016, has killed 113 people in 14 months, treble the previous monthly rate.

US-style "doctor shopping" to obtain multiple prescriptions is difficult in the UK and doctors lack the same perceived incentives to prescribe. On the other hand, overstretched NHS GPs may feel pressure to offer chronic-pain patients pills as a quick option and the UK may be culturally closer to the US than other countries in terms of doctors aspiring to "fix" patients. Physicians for Responsible Opioid Prescribing co-founder Andrew Kolodny worries about UK doctors using "the same playbook as the US of minimising risks and exaggerating benefits".

Like the US, the UK shows distinct regional variations in opioid use. A recent *British Journal of General Practice* study found higher prescription rates in the north of England and a 15 per cent correlation between prescription and economic deprivation; 4 per cent being enough to "get epidemiologists excited", says author Dr Luke Mordecai. The reasons need investigation, the study says. Is it numbers of local people who were manual workers? Or because more affluent people are more likely to question medical advice? Or do doctors in deprived areas feel more comfortable prescribing opioids?

Knowledge gaps may hamper a joined-up strategy. Retired West Yorkshire GP and pain rehabilitation specialist Frances Cole thinks most GPs aren't geared up to prescribe for long-term pain and don't know where to go for trusted information.

While there's data for opioid prescriptions through the likes of Ben Goldacre's openprescribing.net, when it comes to numbers of dependent users "we are running blind", says Dr Farrukh Alam of Central and North-West London NHS Trust. He is reminded of the experience with diazepam, when potential for harm was long recognised, but concerted action has only happened in the last ten years.

Roger Knaggs, an associate professor at the University of Nottingham, says that to license a medicine for long-term pain, trials only need be three to four-months long so data is being extrapolated from short-term studies.

Following the start of Public Health England's review into prescription drugs, the UK Medicine and Healthcare Products Regulatory Agency earlier this month announced a review of warnings on opioid medicine boxes.

> **Overstretched NHS GPs may feel pressure to offer chronic-pain patients pills as a quick option**

Attempting to regulate online sales will, however, be "very challenging", says Dr Alam and, as Professor Knaggs points out, America's stricter labelling regime has hardly stemmed its crisis. Indeed, some argue tougher regulation since 2010 is what has really caused the US's problems by forcing patients towards fentanyl.

More effective might be insisting on the regular clinical review of patients prescribed opioids and a commitment not to increase the dose if painkillers aren't working.

Specialists hope for holistic policy improvements. Dr Cole calls for a primary care taskforce, supporting healthcare workers to teach patients how to pace medication, like nurses teach asthmatics how to use their inhaler.

Oxford University Hospitals Trust pain lead Jane Quinlan wants investment in psychological support services to address the common comorbidities of anxiety and depression. Professor Knaggs adds that those concerned need to be "thinking what the patient can do for themselves", ensuring they remain active.

Access to pain management services is supposedly universal, yet just a fifth of people with problematic pain get it and only 40 per cent of these services offer multidisciplinary best practice.

Finally, given the lure of heroin and fentanyl, it is important to consider drugs law and whether what former drug squad officer Neil Woods calls today's "moralising, abstinence-based approach" jeopardises pain patients.

Any lasting solution must involve an in-depth review of how healthcare and mental health services are delivered, and this may tell us more about why such health crises explode. ◆

Alex Wong/Getty Images

Activists hold a candlelight vigil outside the White House on annual International Overdose Awareness Day last August, calling for an end to the nation's opioid addiction crisis

High-support rehabilitation needs to be reassessed

Continually reviewing high-support rehabilitation is the only way we can effectively improve patient outcomes, says **Dr Tony Romero**, chief executive of Cygnet Health Care

92.6%
of Cygnet hospitals are rated good or outstanding

74%
of Cygnet patients discharged into the community remained there one year later

High-support mental health rehabilitation has been much discussed recently with a new report highlighting the issue of how long patients remain in these facilities, raising important questions for the sector.

Certainly high-support mental health rehabilitation is one of the most challenging areas of healthcare, but it is only by reviewing the role it plays in treating patients with very complex mental health problems and seeking to address the issues raised that the industry will be able to improve outcomes for patients continually and effectively.

For patients who require more intensive care, high-support mental health rehabilitation can be the best solution. Secure mental health services provide crucial treatment and rehabilitation for people who are trying to recover while detained under the Mental Health Act. They may be exhibiting dangerous and challenging behaviour, and may also be a risk to others.

High-support mental health rehabilitation services work with people with very complex needs that cannot always be met by general adult mental health services.

Cygnet Health Care has been providing a national network of high-quality, specialised mental health services for more than 20 years in partnership with the NHS and local authorities. Our services support people with complex and acute mental health illnesses, including schizophrenia, bi-polar affective disorder, personality disorders, eating disorders, learning disabilities, acquired brain injuries, children's services and autistic spectrum disorders.

As one of the best quality providers in mental health hospital rehabilitation in the country, our focus is always on the best outcomes for those who use or commission our services.

Patients admitted to high-support rehabilitation hospitals tend to have extensive comorbidities and typically find it hard to sustain significant clinical gains following discharge. A significant proportion of these people have been so-called "revolving-door" patients undergoing repeated readmission to acute wards at the highest cost to the taxpayer. Research from the University of York last year found that 50 per cent of mental health NHS patients experience relapses resulting in admission to hospital, while NHS patients at a Cygnet hospital benefit from a low 29 per cent relapse rate.

We have data from around 200 patients a year from high-support hospital and step-down rehabilitation services, covering different demographics, psychiatric profile and clinical outcomes. The data looked at patients who had been discharged into community settings, such as supported living, residential care or independent living, to see whether they had remained in the same or lower level of care, or whether they had relapsed and been readmitted to hospital. At least 74 per cent of our patients discharged into the community remained there one year later.

Nonetheless, there are standards that must be met across the industry to ensure successful outcomes like this, and we believe these need to be managed more appropriately and effectively to increase positive outcomes for all patients.

Private providers of healthcare should work in partnership with the NHS and the Care Quality Commission (CQC) to provide these services to the highest possible standards as it is our duty and privilege to provide care for these people who are some of the most vulnerable members of society. These facilities already welcome feedback from regulators and governing bodies, but more needs to be done to provide such services at a higher level and this is the responsibility of all parties involved.

> **We believe that underperforming care facilities should be better monitored if they do not meet the requirements as laid out by the CQC**

The industry needs to work together to improve its standards. The CQC's *The state of care in mental health services 2014 to 2017* report found that 76 per cent of independent services were rated as good or outstanding (72 per cent good and 4 per cent outstanding) and 23 per cent of independent services were rated as requiring improvement (three independent services were rated as inadequate). Cygnet is proud to offer the NHS a provision of high-quality hospitals and step-down facilities, 92.6 per cent of which are rated as good or outstanding.

We believe that underperforming care facilities should be better monitored if they do not meet the requirements as laid out by the CQC. Although currently the CQC inspects mental health hospitals across five domains to ensure they are safe, clean, responsive, effective and well led, we believe an additional domain that focuses on the service user's opinion of the care they received should also be incorporated. This would help to measure soft intelligence and ensure service users feel happy and well cared for in their care facility.

There should also be minimum standards of requirements to run a mental health facility. For example, facilities should be able to provide clear, on-site details of all on-duty staff, including full-time nurses, doctors, psychiatrists and therapists, and have them readily available. We also propose that initiatives such as the Accreditation for Inpatient Mental Health Services from the Royal College of Psychiatrists should form an active part of the review process, not just the CQC alone.

Moreover, we should never underestimate the importance of having an indicator of success. Relapse indicators should always be a factor when determining a patient's outcomes and success in a high-support rehabilitation facility.

Providing effective high-support rehabilitation services is undoubtedly challenging. However, they are critical in trying to address the complex mental health care needs of a cohort of people, some of whom are among the most vulnerable. The most appropriate approach would appear to be service providers, the NHS and CQC working together to address the issues involved in effectively implementing these services. It offers the best opportunity of helping patients move through their recovery pathway, from specialised commissioned secure services through to non-secure rehabilitation services, with the eventual goal of returning back into the community.

Shortening this journey benefits not only the NHS and society as a whole, but most importantly the patient whose wellbeing is our ultimate priority.

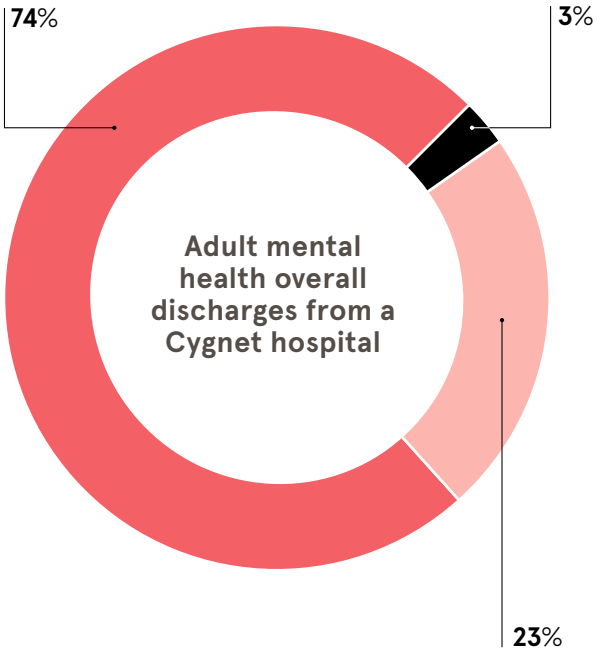
For more information please visit cygnethealth.co.uk

Cygnet Health Care

CYGNET REHABILITATION DATA

Results

Of 193 patients recently discharged, 143 (74 per cent) were **discharged into the community** and 45 (23 per cent) **remained in the same level of care**. There were a further 3 per cent where we were unable to establish the patients' whereabouts



DEMENTIA

Help for people living longer wi

The increase of dementia among the UK's ageing population calls for urgent action to avoid the health service being overwhelmed by elderly sufferers

Phil Lewis/WENN Ltd/Alamy

01

JOHN ILLMAN

The government this month announced a new £300-million plan, including a new hub for the UK Dementia Research Institute, to support the ten million people in Britain who are expected to live to 100. At present the UK has just 50,000 centurions.

This followed World Health Organization predictions that the number of people with dementia will rise from nearly 50 million today to 82 million by 2030 and 152 million by 2050. For the first time dementia has overtaken heart disease as the UK's number-one killer.

The institute is researching all forms of dementia, including Alzheimer's disease, Parkinson's disease and vascular dementia. Care as well as cure is a research priority in recognition that in the absence of a cure, the immediate challenge is to improve the quality of life of people with dementia.

The recent decision by Pfizer, the world's largest drug company, to pull out of Alzheimer's disease research highlights the vast challenge to develop drugs to treat disease in the brain, the body's most complex organ.

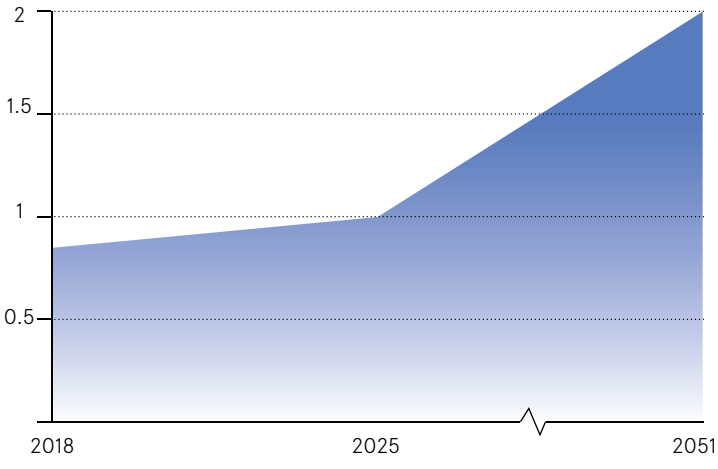
Dr James Pickett, head of research at the Alzheimer's Society, says: "With no new drug in the last 15 years, this will come as a heavy blow to the estimated 46.8 million people with the condition across the globe."

But there are reported to be about 100 ongoing dementia trials. About 20 per cent of these involve so-called repurposed drugs, which were originally developed to treat other diseases. Using "old for new" medicines sidesteps the vast cost, estimated at about £1.5 billion, of developing new drugs. Repurposed products also already have well-established safety records and, unlike new compounds, don't take up to 15 years or more to reach the market.

Recent UK trials with repurposed drugs have involved the world's first clinical study of a Viagra-style drug for treatment of dementia. Tadalafil, better known by its brand name Cialis, works in erectile dysfunction by increasing blood flow to the penis. The hope is that it will also increase blood flow to the brain. Vascular dementia is caused by damage to small blood vessels in the brain, resulting in reduced blood flow.

UK scientists are also evaluating the diabetes drug liraglutide in the treatment of Alzheimer's disease. Both conditions are associated with

PROJECTED NUMBER OF PEOPLE WITH DEMENTIA IN THE UK (MILLIONS)



Alzheimer's Society 2018

01
Fundraisers at a sponsored Memory Walk in London last September, organised by the Alzheimer's Society; more than 110,000 people are expected to take part in Memory Walks this year

02
German geriatrics physician Friedhelm Caspers trialling a dementia patient with virtual reality; the technology immerses patients in scenes of their childhood in an attempt to engage and connect users with happy memories

Source

02

"Stem cell therapy for Alzheimer's disease carries enormous promise

th dementia

misuse of glucose in the brain and with sinister abnormalities known as beta amyloid plaques. The study is due to end in 2019.

Dr Clare Walton, research communications manager at the Alzheimer's Society, says: "We see repurposing as an extremely promising avenue."

Stem cells have the potential to develop into any type of cell in the body, and detect and repair damaged cells. Early animal studies into Alzheimer's disease generated immense excitement, but a report in the journal *Stem Cell Research Therapy* warns: "Researchers must be aware of the perilous gulf... between rodents and humans."

Alzheimer's disease in animals, it adds, had been effectively treated in about 50 different ways, but these results had yet to be replicated in humans. However, the report concludes: "Stem cell therapy for Alzheimer's disease carries enormous promise."

Stem cells are also helping Cambridge University scientists learn more about Alzheimer's. They are taking skin cells from people with rare forms of the disease and using cutting-edge stem cell techniques to turn them into working nerve cells. Remarkable as it may seem, they resemble dementia-damaged cells.

Four hundred people with dementia are taking part in a two-year "smart home" study to test technology that monitors their health remotely. The idea is to enable them to stay safe and well, live longer in their own homes, reduce hospital and care home admissions, and relieve stress on carers.

Sensors installed in patients' homes measure their movement and let clinicians know, for example, if they fall. A GPS tracker will sound an alert if they wander too far from home.

The TIHM (technology integrated health management) study is even identifying people with urinary tract infections (UTIs), enabling them to be treated quickly at home. UTIs are one of the top five reasons for unplanned hospital admissions among elderly people. The others are respiratory infections, falls, strokes and fractures.

Surrey and Borders Partnership NHS Foundation Trust are due to publish the results of the study, which ends this Saturday, later in June.

We look to technology to discover dementia treatments, but paradoxically technology of different kinds has exacerbated the impact of dementia. We are living through a head-on collision between progress and evolution in which we "save" our legs by taking the lift at the expense of our hearts and brains.

Last year the government reported that more than a quarter of UK adults were obese. A further 36 per cent were overweight. Carrying excess fat increases the risk of dementia. Lifestyles have changed, but our bodies still thrive on the stimulus of exercise. Regular heart and brain workouts and healthy eating and drinking could achieve far more than "miracle drugs" to safeguard us from the horrors of dementia.

Dr Walton of the Alzheimer's Society has encouraged her own mother to play table tennis. "She's become really keen and feels a lot fitter. It's the kind of simple activity that can have a huge impact," she says. Being part of a social network, such as a table tennis club, can also reduce dementia risk, the Society advises.

Alzheimer's Research UK is optimistic that an effective treatment could be available in three years and a "vaccine" that prevents the disease within a decade, adding that there are 12 drugs in the final stages of clinical trials. ◆

225K
people in the UK will develop dementia this year, equal to one every three minutes

1in6
people over the age of 80 have dementia

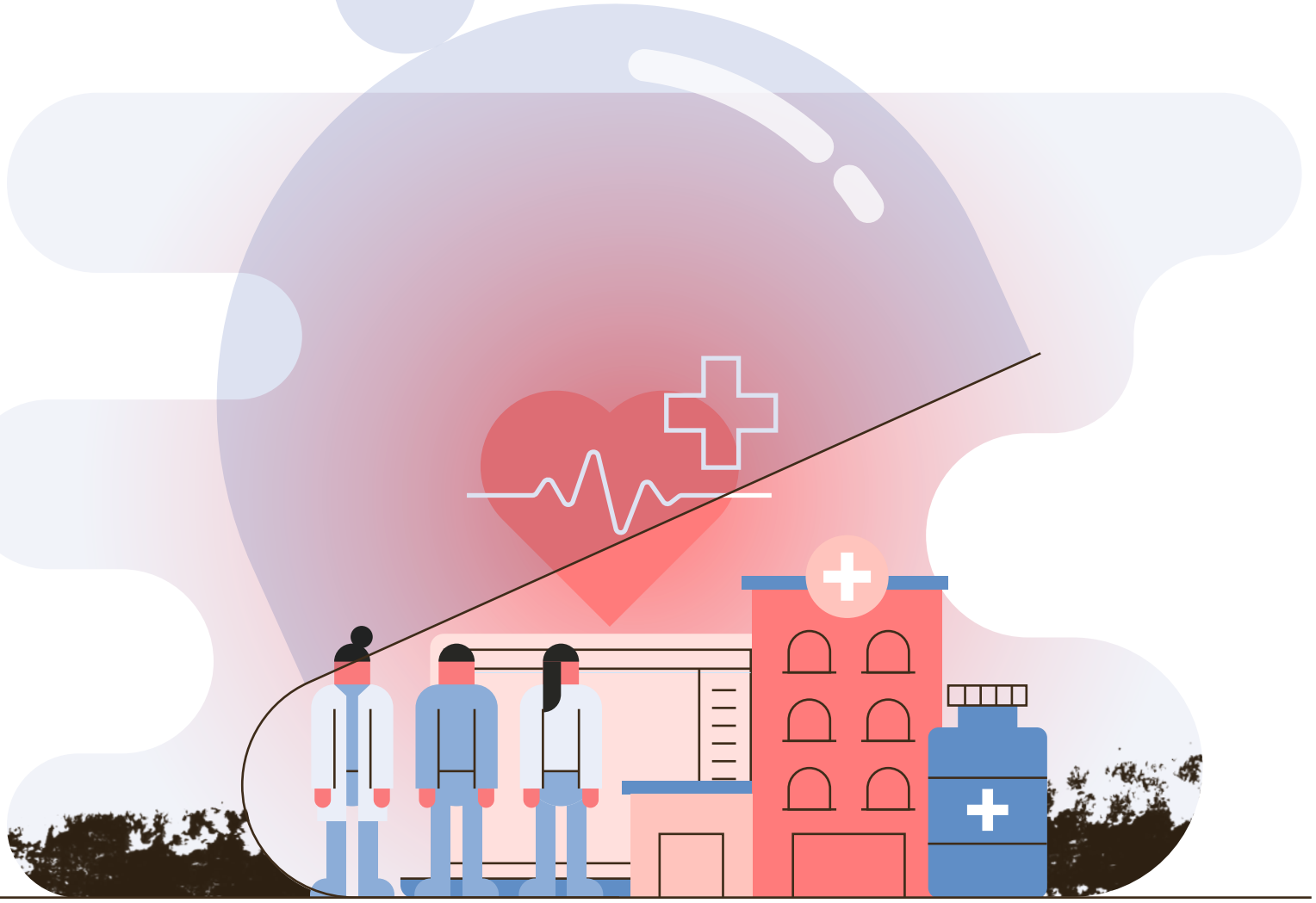
70%
of people in care homes have dementia or severe memory problems

40K
people under the age of 65 have dementia

2/3
of the cost of dementia care is paid for by people with dementia and their families

Alzheimer's Society 2018

CORPORATE HEALTHCARE



Company cover for workplace wellness

Companies are increasingly providing private health cover for employees in a bid to gain flexibility and convenience, while at the same time helping to relieve pressure on the NHS

HAZEL DAVIS

Amazon's newest venture into healthcare, with Berkshire Hathaway and JPMorgan Chase, is ruffling US stock market feathers. It's not surprising, given the company's form for upending markets. But why are corporations such as Amazon stepping up to provide healthcare for their employees?

Panos Constantinides, associate professor of information systems and digital healthcare tech researcher at Warwick Business School, thinks Amazon is in a powerful position, thanks to its changing business model.

"Amazon started off as an online retailer, but gradually moved towards a multi-sided platform model that enables different actors, buyers, sellers and other third parties to co-create value," he says. "Over time, it has grown so much that it has increasingly taken over a number of businesses with physical assets, while getting involved in more traditional supply chains, including supermarkets and drugstores."

This ability to run both a multi-sided platform and a supply chain model is very powerful, says Professor Constantinides. Multi-sided platforms require low operating costs, but provide high-percentage margins because they usually take a cut from each transaction, which goes straight to the bottom line.

In contrast, supply chains typically have higher revenues, but also higher capital investment in infrastructures, such as data and product warehouses and distribution, as well as higher operating costs and lower percentage margins.

The two, therefore, complement each other, enabling Amazon to achieve greater and faster scaling on additional businesses, while taking advantage of the positive network effects on its existing large installed base. This allows Amazon to avoid the typical chicken-and-egg problem of other businesses wanting to enter new markets.

Amazon's move into healthcare services, such as pharmaceutical distribution and health insurance, makes sense, says Professor Constantinides, because it can capitalise on economies of scale in its existing infrastructure investments, while feeding into more innovative products and services. Amazon has the capability to manage the logistics of delivering multiple items on the same day.

In addition, the company's big data analytics and artificial intelligence capabilities mean Amazon could develop more accurate pricing and better underwriting decisions than insurers have traditionally been able to achieve. The purchasing power of Amazon, with Berkshire Hathaway and JPMorgan Chase, means they can attract a lot of unsatisfied customers from more traditional insurance companies.

> **Every employee who is seen by a GP promptly is one more healthy, valued and productive person in the workplace**

However, it might be difficult for anyone else to get a look in, says Professor Constantinides, "Although it is difficult to predict any outcomes at this stage, it is safe to say that companies with an adaptable infrastructure, big data analytics capabilities and access to customer data will dominate this space," he says.

But what about in the UK, where healthcare is still seen as a publicly funded right? Can this ever work? Ben Teichman, co-founder of Doctaly, which allows employees to book a 15-minute private GP appointment near work to fit around office hours, claims the NHS is currently not fit for purpose.

"We are huge supporters of the NHS and its core principles," he says. "However, after more than 15 years in the primary-care space, we've accepted that general practice in its current form is unsustainable. We must appreciate that the NHS was founded in 1948 and its architects couldn't foresee the challenges that such a complex system would face 70 years later, with a growing and ageing population suffering from increasingly chronic health conditions."

The system is broken, says Mr Teichman. "We must consider alternative solutions that could support the sustainability of general practice and the NHS," he says. "Employee wellness is crucial to the UK economy. Some 137 million working days were lost to sickness absence in the UK in 2016 and absence costs, on average, are £522 per employee a year."

A service such as Doctaly, Mr Teichman points out, provides private GP cover for businesses and their employees from just 30p a day. This is important, he says, because: "Virtual GP services aren't valued in the same way as face-to-face consultations." Provision of GP access for patients who are willing and able to pay for the convenience of an on-demand service alleviates the burden on the NHS as every self-paying, private patient is one less on the NHS waiting list. "And every employee who is seen by a GP promptly is one more healthy, valued and productive person in the workplace," says Mr Teichman.

Jeremy Huband, head of healthcare at HSBC, says: "Historically we have seen business groups set up mutual funds to pool cash to cover a well-understood risk. What a mutual fund does is collect and invest funds to cover future eventualities, normally with some sort of stop-gap insurance to cover any unforeseen event.

"While this group may not have stop-gap insurance, they will have huge reserves to cover such eventualities. Therefore, instead of dealing with the private medical insurer, staff will contract directly with private hospitals and may get a faster, inclusive and more transparent service, though the level of care provided by the hospital will remain the same."

There has certainly been a rise in the number of UK corporations paying for their staff's medical expenses over the last few years, so it's a model that is already showing signs of working in the UK. But there is risk involved as the company must know its claims history well enough to be sure it can cover most eventualities and have the ability to cover exceptional years. ◆

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