

The Journal of mHealth

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COVID-19 HEALTHTECH HUB

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Welcome



The unprecedented events of the past few months have resulted in some of the most significant transformations in healthcare provision ever introduced. In the space of a short period of time the healthcare industry has been forced to adapt and respond to the Coronavirus outbreak and in many instances technology has played a huge role in facilitating that transition.

From tele-triage and video consultations to remote monitoring and staff collaboration, health technologies and digital solutions have been rapidly adopted in order to allow healthcare organisations to introduce socially-distanced care pathways and manage health populations during this extremely difficult period.

During this time we have seen HealthTech thrust centre-stage as healthcare practitioners and patients rapidly adapt to a new way of delivering care. From our perspective we have seen more traction in terms of healthcare technology adoption in the past 3 months than in the last 5 years, and as the questions start to move towards how we can sustain this momentum, this edition of the Journal brings together a complete range of articles that look at the many ways that technology has been used to help and support healthcare provision during the Covid-19 outbreak.

With the landscape changing rapidly, we are striving to support our audience with daily updates on thejournalofmhealth.com and we will continue to ensure that we offer valuable resources that can help support healthcare providers implement digitally-supported care pathways.

Also, in this issue we consider the key aspect of patient satisfaction and the way that digital solutions must meet the multifaceted requirements of end-users. Patient and user experience are ultimately the most critical measures when it comes to understanding and managing the success of digital transformation projects.

We would also like to take this opportunity to thank all the healthcare key workers, who make up such a huge proportion of our audience. The commitment and devotion that so many of you have shown during this hugely challenging time is formidable and greatly appreciated!

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Editor

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Consolidated Data is an Essential First-step Towards Delivering Effective AI Health Initiatives

Technology-enabled tools are being adopted in healthcare for their potential to improve population health, reduce hospital readmissions, cut operational costs and enhance the accuracy of clinical outcomes.

Increasingly many of these solutions are beginning to harness artificial intelligence (AI) and machine learning techniques, and across a wide spectrum of medical specialties these types of algorithm-based technologies are beginning to have a measurable impact on diagnostic efficiency and accuracy. We are now at a point where technologies have matured sufficiently to be able to transform healthcare for the better, by automating clinical information analysis and streamlining workflows, thereby improving patient care and outcomes.

However, for healthcare systems, AI and machine-learning driven technologies are only effective when an organisation has implemented measures to compile a robust and accurate data landscape. Healthcare providers can only achieve the best clinical outcomes when quality clinical information can be made acces-

sible to AI and machine learning tools. This is where the solutions of a content services and enterprise imaging provider, like Hyland, can provide healthcare organisations with the data foundation, and information interoperability, necessary to fuel AI-driven health initiatives.

“Applying AI, machine learning, analytics, and population health tools to partial or inaccurate data sets will yield less than optimal results. And, the unfortunate truth is the clinical data that resides in most health systems today is woefully incomplete and disjointed,” comments Susan deCathelineau, Senior Vice President of Global Healthcare Sales and Services for Hyland.

“More often than not, digital clinical information is compartmentalised in multiple proprietary and unconnected siloes. In many instances, the critical clinical stakeholders in an institution are not even aware much of this information exists. Achieving optimal results from any analytics initiative requires organisations to implement a thorough data discovery, consolidation and integration effort that then provides them with a solid founda-

tion of clinical content to which analytical algorithms can be applied.”

To achieve optimal results, healthcare providers need enterprise medical imaging and enterprise content management technologies that can connect semi-structured and unstructured content to enterprise systems like electronic patient record (EPR) systems. Only by having this interoperable data foundation, feeding relevant information, from disparate sources, are providers going to be able to deploy AI and machine learning solutions effectively.

Achieving this type of data consolidation requires close partnerships between technology vendors and healthcare organisations that bring together the necessary expertise capable of consolidating, often vast, existing data sets.

By effectively combining data, healthcare providers can see benefits across the whole organisation, and create a framework that can enable true health data interoperability.

EPR systems have become a significant source of digital clinical information in

many hospitals and health systems. EPRs are designed to capture and manage structured clinical information and most do this job exceptionally well.

However, the capabilities of these systems are limited when it comes to handling unstructured and semi-structured patient information. This is problematic when you consider that the vast majority of a patient’s medical history isn’t inherently captured, or stored, in an EPR. This issue is exacerbated when you consider some healthcare providers fail to look beyond the EPR when it comes to evaluating a patient’s medical history.

Enterprise content management systems have predominantly been used by healthcare organisations to digitise unstructured data like clinical notes and transcripts, emails, faxes, photos and other sources of patient information, but often these remain partitioned within specific departments, leading to a further fragmented data landscape.

One of the biggest challenges in this data equation is providing secure access to the massive amounts of medical imaging data that health systems have accumulated. This imaging data comes in a variety of formats and is largely stored across disparate systems and archives. These assets include surgical video, endoscopy, dermatology photos, wound images, pathology studies, and more, whose native formats range from JPEGs to TIFFs to MP4s. Consolidating these images into a single source, and anonymising the data, for AI and machine learning purposes can be tedious and time-consuming.

Therefore, enterprise medical imaging and enterprise content management (ECM) technologies that connect these disparate sources of semi-structured and unstructured content to enterprise systems like EPRs are essential to properly feed AI, machine learning and predictive analytics initiatives.

“Our customers rely on Hyland Healthcare enterprise imaging solutions and expertise to not just manage, but curate their medical data for clinical and research purposes,” says Chris Magyar, Senior Manager of product management at Hyland Healthcare. “They use our AI-powered visualisation tools to enhance the diagnostic confidence of



imaging professionals around the world, help AI streamline clinical workflows and automate repetitive tasks.”

Case Study: Yale New Haven Health

Evidence of the impact interoperable ECM and enterprise imaging systems can have on pioneering AI and population health efforts are just beginning to emerge.

Yale New Haven Health is one example where the power of this type of interoperability has been illustrated. As part of a research endeavour the provider developed APIs that allow head and spine CT imaging data to be pulled directly from its vendor neutral archive (VNA) and run through AI algorithms to determine ways to improve workflow efficiency in the ED.

This process allows for large volumes of imaging data to be analysed rapidly. With the VNA interface, CT scans are randomly sampled, aggregated and anonymised in an automated fashion. If staff members had to complete this step manually, it would take five to six hours to pull and aggregate each study for the AI tool.

The standards-based vendor-neutral nature of enterprise imaging solutions also helps support broader population health initiatives by providing a platform that facilitates image sharing among different locations within a health system as well as with other healthcare providers within a region. This capability not only streamlines continuity of care for a patient but also helps to ensure regional population health initiatives are infused with the most

comprehensive set of patient imaging data possible, regardless of origin. Breaking down imaging silos leads to more robust data sets, and more robust data sets provide more accurate results.

When you successfully consolidate unstructured clinical content and link it to core enterprise systems, you create a framework that can enable true health data interoperability, which means that vendors can come and go, and the health data itself remains intact.

Exponential Potential Benefit

AI is taking root across many industries at a rate that is 10 times faster, and 300 times the scale, of the industrial revolution, according to a recent report by the McKinsey Global Institute. Although McKinsey says that AI adoption in healthcare is currently at a rate lower than other industries, the overall impact of AI could be 3,000 times that of the industrial revolution.

“The healthcare industry will need to adapt its care delivery processes appropriately to successfully navigate this transformation. Combining content services with enterprise imaging solutions gives organisations the opportunity to connect all their unstructured data and create a single enterprise repository of patient-centred content that can feed AI-based technologies and improve outcomes,” concludes deCathelineau.

To learn more about building a consolidated clinical information landscape visit www.hyland.com/en-gb/healthcare ■



Digitally Empowered Patients

In our digital-first society, we now use our smartphones for a plethora of things. It has become an extension of our lives – connecting with loved ones, managing business affairs, capturing memorable moments and so much more. They are trusted with our most valuable digital information, including our finances. It makes sense, therefore, that they are also now becoming part of our healthcare journey and arguably have been since the introduction of Fitbit, seeing users take control of their basic health statistics (even more so with the introduction of the Apple Watch ECG app in 2018). Health organisations, including the NHS, have already started making the most of the opportunities ever-evolving technology is opening up, developing and innovating to help use data for good.

Amanda Payne, head of government services at strategic UX agency, Nomensa, explains why we should be empowering patients and putting the control back into their hands.

We know that digital technology gives us the ability to put the control back into the hands of the patient and join up the patient journey. This is one of the reasons why the NHS has several approved third-party apps that allow users to centralise their information – from GP appointments, test results to allergies and more, giving them a full picture of their healthcare when addressing medical professionals, carers or in some cases for those with complex needs, family members. However, as with wider healthcare solutions, this is initially approached at a centralised level and then pushed out on a regional level. After all, from a trust perspective, regional bodies have the insight to better understand their patients, their needs and the ability to deliver a low-cost solution that matters.

Any medical professional will tell you that the best way to treat any illness is through preventative measures, where possible.

Although healthcare professionals can certainly play a key role, the patient must be on board to achieve measurable results. According to the Centers for Disease Control, chronic diseases are responsible for seven out of 10 deaths in the USA annually, and accounts for 75% of healthcare spending. Yet a large percentage of these (including heart disease and diabetes) can be combatted with a close focus on health, with the patient and medical professionals working together. If this technology can carefully place the control back into the hands of the patient and more individuals use data insights to connect and understand the full picture of wellbeing, it'll help to reduce the stress and financial strains of the NHS in particular, thanks to reduced spend on treatments, shorter appointment times and more.

Digital as a Driver of Social Care

On a social care level, this can also be truly transformative for patients and NHS bodies. Local councils and healthcare trusts, in particular, are continuously looking for ways to keep people in their homes for longer and keep them safe whilst doing so. This can involve voice technology in the home to provide reminders for essential medication, sensors to detect unusual movements or apps to track water consumption to avoid dehydration (a key cause of hospital admittance for those with complex needs). This also benefits carers (often operating on an agency level) and family members supporting the patient, providing a wider picture of health and improved communications, particularly for shift management and support cross over.

Getting the data landscape right

Although the control can be put in the hands of the patient, health-

care professionals are not yet necessarily able to see this information on their system. Data is pulled from different places in the NHS which means that for those patients who see numerous doctors, the technology is not currently as streamlined as is the case for the patient. However, healthcare bodies have recognised this challenge and a solution is currently in development. While progress is undoubtedly being made in this area, but we cannot disregard patient wishes. For example, many members of the older generation may not want to put their healthcare in the hands of smart technology or may not fully understand its capabilities, and accessibility is a key consideration for all of this. For example, if the user experience is not optimised for use, this will be a major breaking point.

Regardless of accessibility, work still needs to be done to break down barriers of usage. We have an increasingly ageing population in the UK and for those who require higher levels of care or are suffering from complex health needs, this technology can be revolutionary. Yet, it's important to pose the question – whose responsibility is it to shape this digital experience for the patient? Does this come down to the already time-poor medical professionals or should we be looking elsewhere if we want to truly digitise the patient journey? We've seen significant development in healthcare technology in recent years including big data, artificial intelligence, mobile technology and more, this hasn't been fully integrated into daily healthcare practices UK wide – yet. To truly see change, silos will have to be addressed and collaboration is key. This will involve better communication between digital systems, as well as with varying bodies operating within the NHS to shape a system that could be fully accessed by medical professionals, carers and individuals alike.

Although the US is often regarded as the frontrunner in this

race, the UK is working hard to improve the patient experience with digital at the core. It has reportedly committed £150 million to develop healthcare technology, reinforcing its position with policy changes to encourage development (including tax credits for research and development biotech companies). However, other countries also making strides in this area include Canada, which is currently at the forefront of stem cell research; China, investing \$140billion in reforming its health and biotech sectors; and also, India, with the introduction of bold new government initiatives and international company buy-in.

In summary, by offering control and greater data insights to patients around their state of health, it's arguably relieving pressure from the NHS. We know that hospital resources, including hospital beds, are limited as of late, but intelligent data and technology aims to reduce this stress by giving patients greater control of their healthcare. For example, Fitbit was once described as a 'check engine light' for the body and has been used by cardiologists to monitor patient activity levels and heart rate, alerting doctors to signs of trouble. It's also one of the reasons it's utilised by healthcare insurance providers, keeping general wellbeing at the forefront. This technology, alongside NHS approved applications, can help speed up the check-up process too, helping to alleviate stresses of time-poor individuals whilst maintaining a positive patient experience, making them digitally empowered.

About the Author

Amanda Payne, Head of Government Services at strategic UX agency, Nomensa, works closely with healthcare clients including NHS Digital and more, contributing to award-winning projects with a digital-first mentality. ■

COVID-19 The Impact on Digital Health and Future Considerations



Dr Janak Gunatilleke, CEO at Mindwave Ventures, reflects on the effect COVID-19 is having on the UK NHS and what that means for digital health.

Thinking through the present operational challenges, restrictions imposed by lockdowns and changing attitudes and behaviours, it appears that digital health has been provided with an opportunity to prove its worth. I believe that, in order for digital health to have an impact that is both meaningful and sustainable, we must look ahead at both the medium term (six months from now) and the longer-term (one year from now).

Until a couple of months ago, the digital health sector has been struggling to scale their products and innovations. The NHS has always been cautious (rightly so in some cases), with decision making slow and with many layers.

In addition to the catch-22 situation of requiring evidence (and having to find early adopters to get the evidence), getting budgets approved could be challenging, especially where benefits were delivered in the medium term or in a location in the healthcare ecosystem different to the 'budget holder'.

All that has changed with COVID-19

The effect it is currently having on the digital health sector is unprecedented, with a marked acceleration in

the adoption of technology across the NHS. To maximise the positive impact in a sustainable manner, there are key medium and longer-term elements we should consider.

The NHS policymakers, managers and frontline staff are working to meet the immediate operational requirements and dealing with the substantial disruptions caused by COVID-19.

First, strict measures on social distancing and self-isolation result in the need for virtual ways of working, both for staff managing internal operations and clinicians interacting with patients.

Second, COVID-19 has shown us that we need more effective and safer ways of managing patients including 🏠

increased hospital capacity, intensive care equipment and not to say the least, appropriate protective equipment for front line staff.

Third, with a vaccine still many months away, there is a continuing need to accurately monitor, predict and plan for ongoing infection including testing, contact tracing and efficient isolation of at-risk and exposed people.

The NHS and the public are responding rapidly

The government passed emergency legislation to amend the Mental Health Act to relax requirements for sectioning a patient. The Excel centre was converted into the 4,000 bed Nightingale hospital in 9 days. NHSX issued pragmatic guidance to clinicians on information governance related to videoconferencing, messaging, using their own devices and sharing of information.

The NHS also put in place wider measures to roll out video conferencing in primary care including fast-tracking assurance of video products on the new Digital Care Services Framework.

The general public has also shown a growing willingness to adopt these technologies should they be made available, which longer-term could result in significant improvements to the speed in which a patient can be reviewed and appropriate care delivered.

A survey of patient contact preferences for a GP consultation agency found that 47% of respondents preferred a phone consultation, compared to just a quarter (25%) who requested a face-to-face consultation¹.

Professor Marshall, Chairman of the Royal College of GPs stated on the 11th of April that the in-person GP appointments had drastically reduced from 80% in the last year to 7-8% over the last 3 weeks. He also pointed out that the majority of the virtual consultations were being done over the phone rather than via video call. The preference for more simple technology, like phone call consultations, means that the barrier of entry is a lot simpler and is able to be rolled out nationally more efficiently than implementing more complex technology systems.

The demographics of digital health adoption also appears to be changing. Analysis from online pharmacy service Echo shows a dramatic increase in over 65s using their service over the course of March².

The pandemic has also seen rival companies work together in an interoperable fashion, with Apple and Google recently announcing they are working together to create a COVID-19 symptoms tracker to work across both iOS and Android devices.

Mindwave partner and start-up Thala-

mos is just one example of a health-tech company that has adapted to support the industry during the pandemic. With increased pressure on mental health services as a result of COVID-19, Thalamos is responding to new emergency Mental Health Act legislation, by accelerating new features and functions of their mobile application for social workers and doctors.

The temporary emergency legislation means that one doctor, rather than two, can sign off a Mental Health Act assessment. These measures have been introduced because the government is concerned that Covid-19 will reduce the number of mental health professionals available to help people whose mental health places them at risk.

These new features will not only support mental health practitioners to undertake their work more efficiently, they will also afford a degree of social distancing, insofar as digital notes can be transferred safely to the hospital, rather than by the practitioner having to deliver them in person. By making these changes, we hope to decrease the pressure on services and make life easier for doctors and social workers.

Six months later

In the medium term, following the fire-fighting phase, we will hopefully enter recovery. Within this phase, there will be three key elements to consider:

First will be around how care is delivered. Patients, clinicians and the general public will have been used to virtual interactions, online transactions and getting things done from home (including deliveries). Having gone through managing minor injuries, illnesses and routine illnesses without going to see their GPs in person, visiting the local A+E or outpatient clinic, both patients and clinicians may well consider virtual consultations as (at least) a preferred choice.

Professor Marshall believes that up to 50% of GP appointments may be conducted virtually. With NHS resources and clinician's focus diverted to COVID-19 related patients, medical emergencies

figured out quickly. To meet these challenges, the ecosystem will need to be based on open standards and have transparent evaluation and assurance frameworks. Some solutions will have to be replaced with others that plug the gaps.

Third will be around supporting staff through the change. Staff will need upskilling on the new ways of working. These skills will undoubtedly include digital health and communication-related skills. Communication will take a whole new form including supporting patients, carers and family virtually and also on how to work effectively with cross-organisational colleagues in social care and local government.

considered. This should also factor in emerging technologies such as artificial intelligence.

As well as rules and policies, it will be important to equip the clinical workforce to be able to better understand current technology trends and solutions and to determine which are effective and could be beneficial to their clinical practice. This education should start at undergraduate level.

Second, incentives and implementation must be optimised. At a basic level, funding flows must be restructured to account for the nature of digital solutions and wherever possible budgets should be pooled to enable pathway-level consideration to avoid 'siloed budgets' leading to disparity.

It would also be (high) time that appropriate payments are moved on to an outcome-based model. There is little point paying purely for shiny kit and the latest tech. At the start, adequate attention must be given to acquiring and engaging with users. Extra resources and specialist skills where appropriate should be allocated to support the implementation of the solutions.

Finally, the environment for continual innovation must be designed and nurtured to ensure progress does not stagnate. We must reflect on the factors that enabled rapid adoption, take time to understand user requirements and strike the correct balance between openness and risk management.

To fully identify and understand all aspects of these considerations the health tech industry, policymakers, health and social care organisations, clinicians, patients and the wider public must all collaborate. This crisis has highlighted the importance of cooperation and the collective power of groups. I hope we can all work together to realise the maximum potential of digital health.

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“It appears that digital health has been provided with an opportunity to prove its worth.”

and people with acute illnesses, those with chronic conditions will have been provided with information, alternate support and signposted to (including by peers with their condition) to apps and technology solutions.

This will provide a good foundation to identify, develop and deploy sustainable technology-enabled self-management pathways.

Second will be around how we foster a meaningful technology ecosystem. Due to rapid uptake, there will be a number of solutions for solving similar problems. Fragmentation will be widespread. Due to rapid implementations, there will be limited unifying workflows or interoperability. Evaluations that were less rigorous than usual will result in some less effective and more risky solutions in the system.

A large number of new implementations will have been implemented for 'free' or on 'extended trials', commercial terms and who pays for what will have to be

The ability to support mental health issues will no longer be the responsibility of a select few. Supporting users to be aware of and use the solutions effectively will increasingly become important once the hype dies down and the necessity for virtual first recedes.

A year from now

In the longer term, the focus will be on consolidating the new norm. I believe that within this phase, the following will be the key focus areas.

First, legislation and assurance frameworks will need to be overhauled. Based on lessons learnt and evaluation of the outcomes based on changes made in the past year, legislation should not hinder the adoption and scaling of digital health, and should afford a degree of flexibility for the future.

Having said that, as a counter-balance, assurance levels must be implemented to ensure the appropriate levels of risk management and patient safety are



4 Ways Telemedicine Innovation Improves Patient Satisfaction & Emergency Department Utilisation

Healthcare systems across the US have lately shown remarkable interest in the digital sphere, specifically telemedicine. The utilization of telemedicine has rapidly increased over the years and it is now employed in all aspects of healthcare - inpatient care, outpatient care, workplaces, nursing home care, and consumer homes.

Today, almost 70% of providers use some sort of telehealth or telemedicine tool, and 71% of people prefer to search for health-related information using a voice assistant.

Over the past few decades, the healthcare industry has increasingly engaged and, to a certain degree, driven technological innovation and advancements. Consequently, telemedicine has metamorphosed into what it is today.

In this piece, we will be looking at a few ways innovation in telemedicine has improved patient satisfaction and emergency department utilization in hospitals.

1 Improving ER Patient Flow

It is well known that long emergency room wait times are a tenacious challenge for health systems and hospitals across the country. The rate of emergency room visits has increased significantly over recent decades in the U.S., rising from 360 visits per 1,000 residents in 1995 to 445 in 2017, according to a report released recently by Autoinsurance.org.

With patient volume in emergency departments expected to increase further in the next few years as sicker, more complex patients drive up ED care, it has been predicted that this challenge of long ER wait times will only grow further.

So what should you do to manage the rising ED demand? The answer is simple- deploy a telemedicine solution depending on the goal of your healthcare organization.

Physician leaders at Milwaukee-based Aurora Health Care recently leveraged one such telemedicine solution with the objective of ameliorating patient flow in its emergency rooms. The overall goal behind this move is that of amplifying efforts toward patient care and providing a better patient experience. The ED solution, a tele-triage approach, was deployed first at Aurora Sinai Medical Center in December of 2017.

"We now see over 60,000 patients a year, and just a couple years ago, we were under 50,000 patients a year. So we were seeing a gradual increase in our door-to-provider times, and our overall length of stay, so we needed to come up with a solution to help address our increased demand," - Paul Coogan, M.D., president of Aurora Emergency Services and an emergency department physician at Aurora Sinai.

2 Digital Stroke Care

A person experiencing a stroke loses anywhere around 2 million brain cells every minute when a rupture or blood blockage deprives the brain of oxygen. Unfortunately, it is difficult to comprehend without a CT scan whether the patient has a bleed or a block, and giving the wrong treatment can be lethal.

Telemedicine is streamlining cardiac care like never before. Telestroke programs connect regional hospitals with a neurological expert who can speedily assess a CT image and guide the physician on-site in the right direction. These programs have drastically improved patient outcomes and they also reduce the door-to-treatment time.

New York- Presbyterian took this technology one step further by coming up with a Mobile Stroke Treatment Unit (MSTU). This specialized emergency vehicle has CT imaging ability onboard, is staffed by a neurologist, and is dispatched by the New York City 911 System through the FDNY directly to a patient the moment he/she displays signs of a stroke. The said unit contains medications specific to treating and diagnosing strokes, enabling the team to send the right drug straight away upon diagnosis.

3 Triage Based On Prognostic Criteria

A large number of patients with kidney stones return to the ED a number of times due to repeating symptoms. Patients then tend to receive duplicative imaging studies and are often admitted to the hospital. Once admitted, most physicians and patients expect resolution preceding discharge through potentially futile surgical care for simple stones.

According to one recent report, most ED visits don't require immediate attention. In order of increased severity, visits are segregated as - nonurgent, semi urgent, urgent, emergent, emergent and immediate. Additionally, only 9% of emergency department visits are categorized as "emergent," while 1% require immediate attention. The majority of cases are considered "urgent."

To tackle this problem, Minnesota-based HealthEast Care System came up with an innovative telemedicine approach that offers expert care in decision making with respect to hospital admission and to facilitate outpatient management with same day and next-day visits using a dedicated subspecialty stone management clinic.

In this method, with early review of clinical history by experts, patients could be triaged based on prognostic criteria. Those patients with a high probability of spontaneously passing their stone could be thoroughly educated and assisted in outpatient management. On the other hand, those with slight chances of spontaneous resolution (or significant comorbidities) could be



diligently directed to definitive surgical care.

The organization saw a 48% reduction in ED repeat visits and 42% decrease in hospital admissions post the implementation of this system.

"We reduced unnecessary ED visits, hospital admissions/readmissions and non-definitive surgery. The net effect of these improvements is a 21.2% reduction in cost of care (approximately \$1,090 per stone patient presenting to the ED)," the organization's spokesperson told Health Partners in a recent interview.

4 Mental Health Assessments In ED

Multiple types of coercion that bring individuals with mental illnesses into treatment sometimes have considerable implications for their potential to receive care that is responsive to and respectful of their individual needs, preferences, and values—what the Quality Chasm report refers to as "patient-centered care."

The aim of patient-centered care and its associated rules emphasize:

- clinical care that is based on individual patient preferences, needs, values, and decision making; and
- patient access to and receipt of information that permits well-informed health care decisions.

Healthcare providers frequently face fundamental barriers in getting such patients to reach a decision.

Allina Group of Hospitals and Clinics, based out of Minnesota, faced a similar problem. The organization wasn't certain about how it could provide access to mental health specialty care at points of critical decisions at Allina Regional sites that currently

do not have the volume to support on-site staffing.

To curb this shortcoming, the organization leveraged the telemedicine technology to provide the same high quality Mental Health assessment and treatment plan no matter where a patient presents for care. The organization now has specialty care providers in emergency departments. Patients receive an aggressive mental health assessment and temperament planning by a licensed clinician which is documented in a standard EMR for continuity of care.

The technology allows almost immediate face to face contact with the patient, their family and ED treatment team. Patient wait times to access specialty mental health care and time spent in the ED have considerably reduced. Better assessments reduce the practice of 'defensive decisions' to admit patients when in doubt, thus reducing unnecessary admission. Patients are provided with more comprehensive resources and referrals when discharged from the ED.

Closing Words

While telemedicine solutions are still in the premature stages of implementation for emergency care, they will certainly continue to develop and build upon their initial successes. Technology and innovation have become indispensable in traversing the healthcare landscape.

Telemedicine uniquely harnesses technology to provide convenient high quality care and patient access. Healthcare experts across the globe are of the opinion that the enhancement and expansion of telemedicine will garner overall improvements in healthcare, from outcomes to provider satisfaction to patient experience; and take emergency department utilization to the next level. ■

INDUSTRY NEWS

News and Information for
Digital Health Professionals



World's First Wheeze Detection Device Helps Children with Asthma

OMRON has announced the launch of WheezeScan, the world's first clinically validated device to detect the presence of a wheeze in young children.

The new device provides parents, doctors and caregivers the ability to discern if a child is wheezing – subsequently providing the confidence and clarity over next steps that will need to be actioned in line with a child's treatment plan.

WheezeScan has been intuitively designed for straight forward, accurate detection. Parents simply hold it below their child's right collarbone for 30 seconds and wait for a "Wheeze" or "No Wheeze" identification. In addition, WheezeScan's design is sleek and ergonomic, light and portable, allowing parents to have it with them at all times and remove any uncertainty in moments of breathing distress.

The new device provides an objective assessment of the presence of wheezing, removing the guesswork, doubt and indecision enabling parents of children with asthmatic symptoms to confidently follow the doctor's treatment plan.

Wheezing is a whistling or rattling sound on the breath and is the most common symptom of asthma in children under the age of 5. Despite this, at least 44% of parents struggle to clearly identify wheezing sounds before the onset of an asthma attack¹. This can be for a number of reasons, including:

- » The prospect of a looming asthma attack causes anxiety and hesitation
- » Wheezes don't always sound the same¹
- » Children are too young to articulate what they're experiencing

According to Lucía Prada, Marketing Director of OMRON Healthcare Europe, "as a mother of two, I know how stressful it is having a sick child, and how powerless this can make you feel when you cannot figure out how to help them. WheezeScan was designed to give parents confidence in the adequate management



of their children's asthmatic condition. As the first step towards our Zero Asthma attacks vision, it brings into concrete action our vision to do everything we can to minimize the impact that asthma has on patients, and particularly children".

The device's advanced listening technology was designed to identify sounds in a child's wheezing that parents may not be able to hear. A diaphragm of micron-width material detects low-volume wheezing. This, combined with an HD quality microphone, a built-in noise cancelling system, and a specialised on-board computer allows the device to provide a clear "wheeze" or "no wheeze" reading. In addition, a protective internal case ensures durability and long-term accuracy.

WheezeScan also pairs with its companion app, AsthmaDiary for mobile devices. The app keeps track of wheeze episodes, enabling parents to log data of potential trigger factors and

response to medication, as well as identifying trends. What's more, parents can then equip doctors with details about the frequency of wheezing episodes, allowing for more tailored development of control plans.

André Van Gils, CEO & President of OMRON Healthcare Europe comments, "Our Going For Zero promise tells us to do everything we can to enable people to get more out of life because they're not controlled by their condition. With this in mind, we have developed the WheezeScan, which marks a new milestone in our quest to equip people with the best tools to achieve an accurate level of detection and monitoring when it truly counts. As the global leader in respiratory therapy, introducing preventative, highly portable healthcare technology to provide relief right when people need it, is amongst our biggest priorities".

1) Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2016 ■



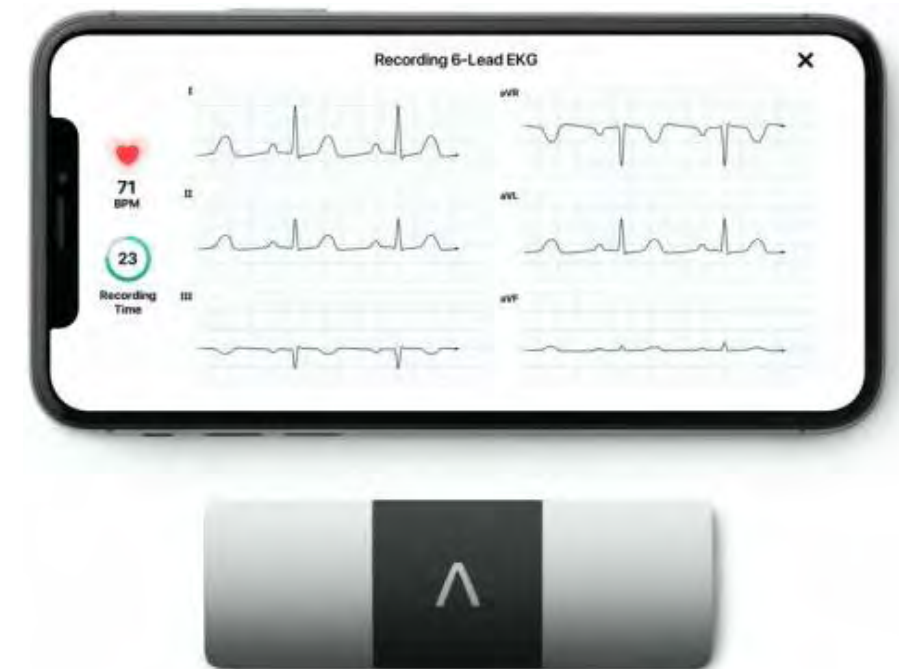
First Patient-Administered ECG Assessment for Continuation of Clinical Trials during COVID-19

ERT has announced a first-of-its-kind partnership with AliveCor, the leader in AI-based, personal ECG technology. The partnership enables ERT to capture digital cardiac safety data with KardiaMobile 6L, the only FDA-cleared personal ECG for patient-administered 6-lead data collection.

ERT is a global data and technology company that minimizes uncertainty and risk in clinical trials so that its customers can move ahead with confidence.

"By combining AliveCor's advanced technology with our proven software and workflow platform, we are enabling our customers to continue developing new medical treatments during the COVID-19 pandemic, regardless of whether trial patients have physical access to investigative site personnel," said Ellen Street, Executive Vice President of Cardiac Safety of ERT. "The device's ease of use, combined with ERT's centralized over-read and data collection methodology make it an ideal solution for ensuring patient safety during ongoing clinical trials."

KardiaMobile 6L is a hand-held, 6-lead personal ECG that records Lead II data without the attachment of electrodes.



Data captured from the device will be integrated into ERT's software and workflow platform and read by ERT cardiologists to ensure patient safety during the clinical development of new medical treatments. ERT provides high quality measurements for QTc, QRS, and other ECG intervals that enable efficacy and safety monitoring during clinical trials.

"ERT's experience in analysing millions of ECGs and their dedication to patient safety make them the gold standard in clinical trial cardiac safety assessment," said Priya Abani, CEO of AliveCor. "We look forward to this partnership and to delivering the innovative solutions and valuable data that clinical trial sponsors require." ■

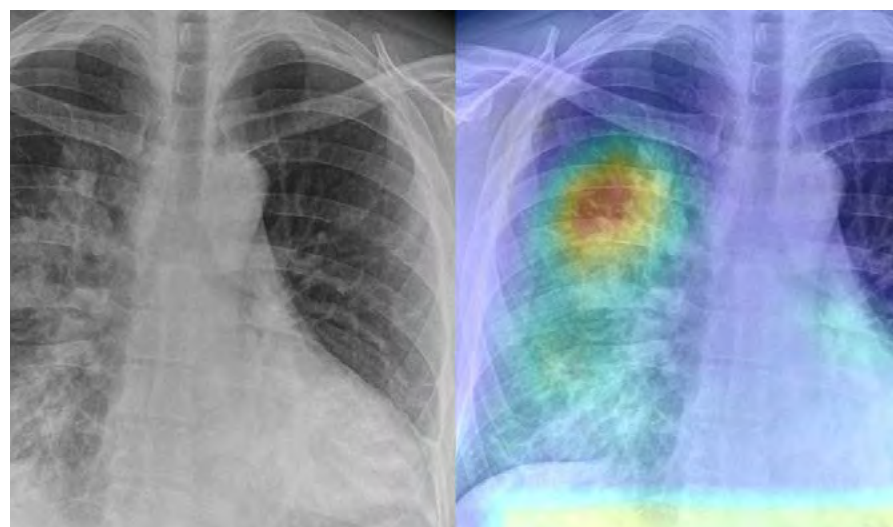
Algorithm Identifies Chest X-rays from COVID-19 Patients as 'Abnormal'

An artificial intelligence-based algorithm has been found to quickly identify chest X-rays from COVID-19 patients as 'abnormal'. The red dot® solution from behold.ai has the potential to provide 'instant triage' that could speed up diagnosis of COVID-19 individuals and ensure resources are allocated properly.

"The majority of deaths from COVID-19 are owing to pneumonia in the lungs of vulnerable patients. Pneumonia is a potentially life-threatening condition caused by a number of pathogens including, directly or indirectly, COVID-19 infection. Our algorithm can detect abnormal chest X-rays including pneumonia almost instantly. Out of 28 X-rays reviewed from patients with COVID-19, we correctly identified 85% of them as 'abnormal' using red dot®," said Dr Tom Naunton Morgan MB FRCS FRCR, Chief Medical Officer, behold.ai.

"As we evaluate further positive cases from across the world, including here in the UK, our results will be further validated. This will increase the utility of our 'instant triage' and potentially help reduce the burden on healthcare systems as more and more cases of pneumonia present and require rapid diagnosis."

The data follows recent news that behold.ai's algorithm has been cleared by



the US Food and Drug Administration (FDA). Commercial roll-out in the US is planned for later this year.

"Our technology can make a big difference to patient safety, and the delivery of care and cost-savings to health services. It is available here and now to help manage the increased burden that will fall on health systems like the NHS in the coming weeks," said Simon Rasalingham, Chairman and Chief Executive, behold.ai.

AI Algorithm for Radiology Triage Receives FDA Clearance

The US Food and Drug Administration (FDA) recently cleared the use of behold.

ai's red dot® algorithm for 'instant triage' in radiology. The clearance applies to the life-threatening condition of collapsed lung (pneumothorax) and alerts radiologists as soon as the X-ray image is captured.

'Instant triage' offers clear benefits over conventional human-read processes when time is of the essence; the algorithm can also help reduce the cost of diagnosis in conjunction with other products. The Company will charge for this benefit on a per exam basis. The clearance gives behold.ai immediate access to the world's largest market for medical devices and commercial rollout of the radiology AI solution, in the US, is planned for later this year. ■

support to all those with need," said Ken Cahill, CEO of SilverCloud. "The need has never been greater than during this unprecedented global crisis. SilverCloud enables easier, earlier access to clinically validated mental health care that shows results equivalent to face-to-face care for the 1 in 5 people with a diagnosable mental health condition. With millions of people being asked to stay home and health systems needing to prioritise care, we recognise the heightened need for virtual support as the world copes with the COVID-19 pandemic. In response, SilverCloud is providing its clients, free of charge, expanded access to its platform to even more healthcare professionals, their families and patients to help make a difference for those in need in the current crisis."

The new - Series B - funding round, led by MemorialCare Innovation Fund, and which included other US healthcare groups LRV Health, OSF Ventures and Unity Point Health Ventures, has helped raise the company's total funding to more than \$30 million and brings together a group of healthcare investors with extensive experience in the US healthcare market.

It will see the company, which has offices in Dublin, London and Boston, enhancing its current global portfolio, expanding availability of its programme offerings in the US and enabling additional research and clinical trials to be conducted. SilverCloud will also expand its presence in Europe, with new and existing partners like Thieme Telecare, part of the Thieme Group and one of the leading providers of integrated care in Germany. Existing investors ACT Venture Capital and B Capital Group, participated in the round as well.

The SilverCloud platform, used by more than 350,000 users and growing by more than 15,000 users per month, has demonstrated results on par with face-to-face therapy in multiple ran-

domised controlled trials. Beyond its industry-leading results in clinical trials, its real-world evidence demonstrates that more than 65 percent of SilverCloud users have shown significant decreases in depression and anxiety symptoms.

SilverCloud's programmes are evidence-based and involve clinical experts and users in the design and development of the mental and behavioural health interventions. Backed by over 17 years of research including partnerships with leading academic institutions, SilverCloud has seen exponential year-over-year growth since 2012.

Raj Ganguly, Co-founder and Partner, B Capital Group, said: "Our investment in SilverCloud Health is driven by our confidence in its team, its proven track record working with global health organisations and its esteemed partner network. This new capital will enable SilverCloud Health to continue to innovate, expand and broadly deploy its programmes to the millions of individuals who need them."

The past year has seen some significant developments for SilverCloud. In October, it announced a research partnership with Microsoft to improve outcomes through artificial intelligence, based at Microsoft Labs in Cambridge, England. In December, it was announced that the SilverCloud platform would be included in digital health formulary of ExpressScripts, the largest independent manager of pharmacy benefits in the US.

This further shows how digital therapeutics solutions are becoming a critical component of mental health treatment and support, and how SilverCloud is determined to stay the leader in delivering outstanding outcomes. More than 94 per cent of users of SilverCloud's scalable and responsive platform said the programmes are helpful, relevant and supported them toward their goals. ■

Global COVID-19 Clinical Trial Tracker

Cytel Inc. has launched an open-access global COVID-19 Clinical Trial Tracker to help facilitate greater collaboration between researchers, policymakers, clinicians, journalists, philanthropists, and other critical stakeholders who need to understand the complex dynamics of the global response to finding a solution to the COVID-19 outbreak.

This will enable them to make more informed and pragmatic decisions on how to channel scarce resources. Clinicians and local government need to know what trials are taking place in their community to ensure that the right patients receive the right exploratory treatment, while philanthropists and Federal policy-

makers deserve a one-stop shop to determine which are the most promising early phase treatment results.

Funded in part by The Bill and Melinda Gates Foundation, a leader in global health solutions, this live dashboard offers an overview of all the trials taking place in the international effort to tackle the pandemic. One of the most difficult challenges facing those seeking a COVID-19 treatment is how little data exists about this disease. Early investigators are relying on guesswork to determine which therapies to investigate. Collating information in one place on the growing numbers of trials, will enable decision-makers to compare treatments

more easily as they determine which to investigate further.

Joshua Schultz, Chief Executive Officer at Cytel, explained, "While much of the world is isolating, the scientific and clinical communities are coming together to fight the COVID-19 virus. United by an unprecedented sense of urgency, there is a level of collaboration that we've not seen before, and, despite the current pressures on the healthcare system, hundreds of hospitals are still committed to working on clinical trials. At Cytel, we have been supporting numerous clients in developing statistically rigorous models for fast data analysis and addressing the various challenges the pandemic ➡

SilverCloud Health Announces \$16M Series B Funding

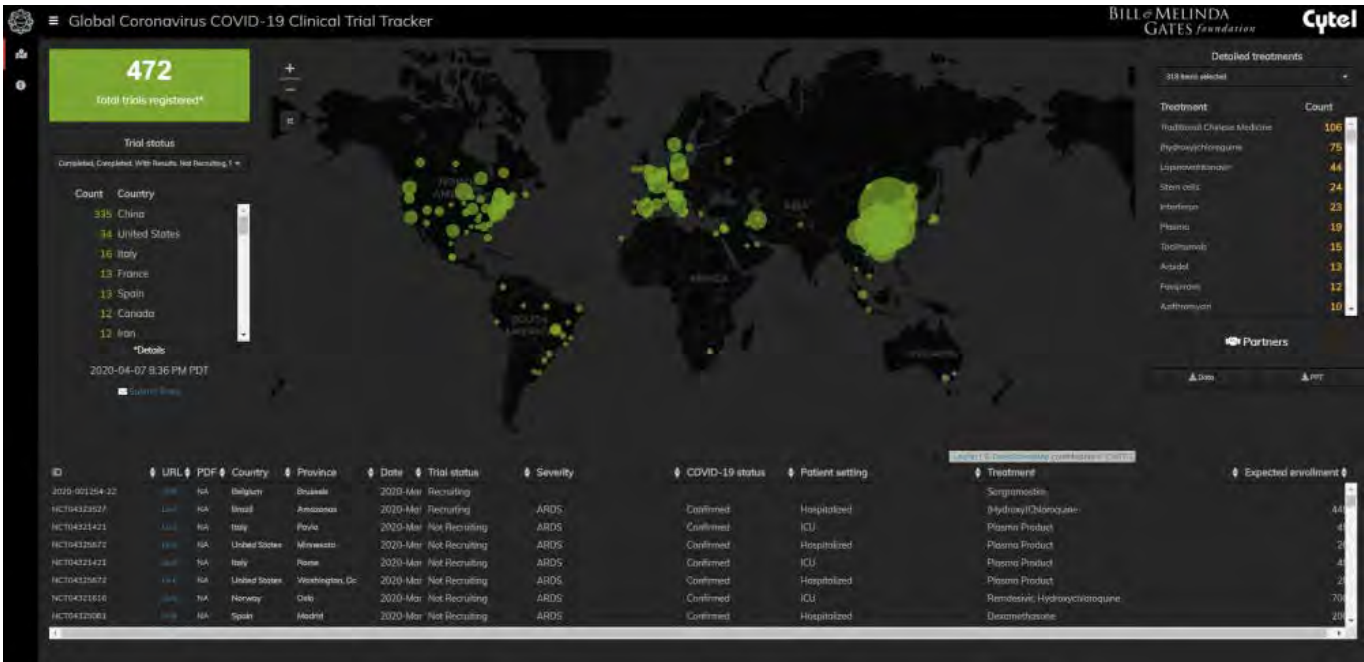
SilverCloud Health, the world's leading digital mental health platform for providers, health plans and employers is to enhance its range of therapy programmes in the UK as part of expansion plans after securing \$16m (~13m pounds sterling) funding from leading health investment groups.

The new funding round will see the company further developing its innovative approaches to therapy, addressing the range of psychological conditions across all age groups. This will include the UK and Europe, and also further expand the

geographical reach of its services in the US.

Founded in 2012, SilverCloud's mental health programmes are used globally by more than 300 organisations including more than 70% of NHS mental health services. It offers more than 30 mental health programmes across the spectrum of mental health from wellness and resilience, through to severe mental health and chronic concerns.

"We are committed to providing truly impactful mental health



presents in the current clinical environment. We are committed to supporting the global effort – and launching the COVID-19 Clinical Trial Tracker offered an additional way to do that.”

In the short time since the outbreak occurred, around 500 trials have already commenced – a number that is growing daily. Without a dashboard, scientists and other stakeholders would have to examine hundreds of different trial registries for updates, to determine which are most promising. The dashboard collates these in one place making it easy to see all the relevant trials and to compare the effectiveness

of treatments. Such comparisons will also help foster more transparent debates about reasonable cost-benefit analysis during times when tough calls are required about where to direct resources. Trials should not be duplicated in different countries because of a lack of awareness of what other scientists are doing internationally. By creating this dashboard to facilitate the sharing of crucial information, Cytel aims to encourage further collaboration between scientific, philanthropic and policy-making stakeholders around the world while also informing journalists, policy makers and local government about options for testing in their area.

Professor Edward Mills, Vice President of Real World Evidence and Senior Principal Scientist at Cytel, explained how Cytel had used its position as data and analytics leaders to identify and resolve a problem they were seeing across the field, “Given our experience building models using real world evidence from all over the world, we quickly identified the need for access to data and reached out to our partners to synthesize their findings quickly in order to develop this dashboard.”

To access the COVID-19 Clinical Trial Tracker developed by Cytel, visit www.covid19-trials.com. ■

FibriCheck App Automatically Detects both Silent and Intermittent Atrial Fibrillation at Night

FibriCheck has announced another world premiere: the first smartwatch app that automatically monitors users’ heart rhythms during their sleep.

The app, which can be integrated into any brand of smartwatch, detects episodes of both intermittent and silent atrial fibrillation (AF), where symptoms are only felt on and off or not at all, making diagnosis extremely difficult. FibriCheck’s latest innovation offers an easy and effective solution for detecting the most common form of heart rhythm disorder which is responsible for 1 in 4 strokes. As such, it represents a unique opportunity for smart-

watch manufacturers to add genuine value to their products in the form of potentially life-saving, built-in technology.

Atrial fibrillation is the most common form of heart rhythm disorder and is responsible for around 25% of all strokes; the vast majority of which are entirely preventable with timely diagnosis and treatment. FibriCheck’s latest innovation for smartwatch has been developed to detect the heart rhythm disorder when a person is asleep, even in cases where there are no apparent symptoms.

Smartwatches with the FibriCheck app installed automatically

measure your heart rhythm every five minutes while you sleep. When you wake up, you have instant access to a detailed overview along with notifications which you can forward to your doctor for follow-up and/or treatment.

Until now, atrial fibrillation could only be detected via expensive medical examinations in a clinical setting. Which is why many people do not have themselves tested, despite the relatively high risk: 1 in 4 people over the age of 40 will develop the condition in their lifetime.

Lars Grieten, CEO FibriCheck: “Our goal is to make it as easy as possible for people to know if they have a heart rhythm irregularity, to prevent AF strokes from happening.”

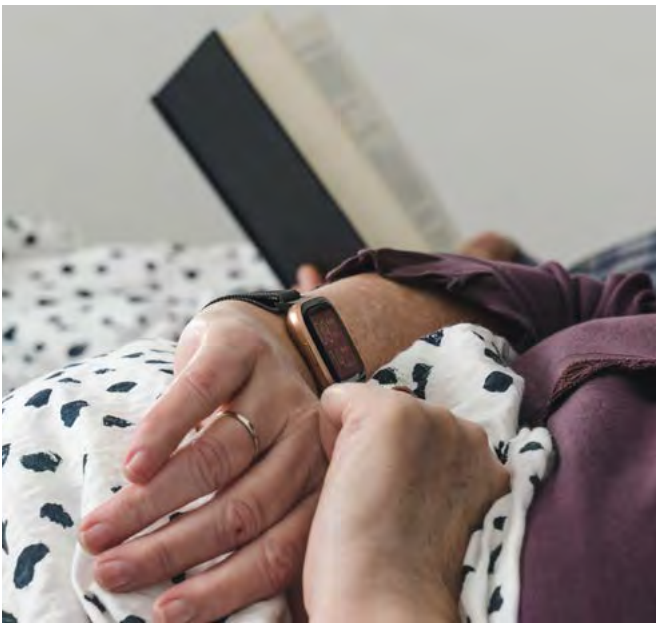
“The FibriCheck heart rhythm app is a device-agnostic medical software application that can easily be integrated into any phone or wearable product that uses PPG (photoplethysmography) sensors.

For smartphone, smartwatch and consumer technology companies, this opens up new possibilities to expand product offerings and provide consumers with innovative ways to manage their health and health-related conditions, including better heart health.”

Extensively validated in clinical settings

FibriCheck is the first medical CE- and FDA-certified app that enables regular and long-term heart rhythm screening. It has been extensively validated in clinical settings as well as large clinical trials in free-living conditions, indicating state-of-the-art performance of its algorithms. Clinical studies have been conducted and comparisons made to state-of-the-art ECG (electrocardiogram) devices such as those of the Apple Watch and the AliveCor KardiaBand.

At present, the new medical smartwatch app is undergoing the final stages of user testing and will be available for smartwatch manufacturers worldwide as of the second half of 2020. One



major smartwatch manufacturer has already reached an agreement to integrate the FibriCheck technology in their products.

Fully continuous monitoring

FibriCheck was recently selected as a high impact innovation by the 2020 NHS Innovation Accelerator (NIA) programme, another step in commercially expanding and scaling up FibriCheck’s market reach. One of the company’s upcoming projects includes making fully continuous monitoring a reality. In this not-too-distant scenario, users will be able to have their heart rhythm monitored constantly and automatically, even during the day.

Lars Grieten, CEO FibriCheck: “This is the first step in turning consumer devices into fully automated medical diagnostic devices. Our next steps will be to add even more devices, and more frequent monitoring, to improve the user experience and make it easier to deliver better capabilities supporting heart health.” ■

Medical Grade COVID-19 Remote Diagnosis App

SDG Group, has announced the launch of an app (Docdot) that will help healthcare professionals address the challenge of finding and monitoring potentially positive individuals, while limiting the risk of exposure of health professionals and other individuals.

Docdot is an AI-assisted mobile app that allows doctors to remotely monitor a patient’s vital signs with medical grade accuracy. A patient just needs to look into their smart phone camera and answer a few questions. The results,

which take as little as 45 seconds to retrieve, can be used to diagnose, monitor and ultimately prevent the spread of COVID-19 with a geo-referenced telemonitoring and televisit solution. A modified version aimed at organisations supporting employees to safely return to work will be available soon.

Quicker, more accurate and comprehensive than alternatives, Docdot is the first remote monitoring and triage tool with the potential to transform the diagnosis, management and treatment of those

with suspected COVID-19, while helping to slow its spread.

Designed and developed by a team of world-class telemedicine and data scientists, Docdot uses a unique combination of light signal processing and AI technologies to convert light reflected from blood vessels in your face into highly accurate real time vital sign measurements, including:

- Heart rate (BPM)
- Oxygen saturation (SpO2)
- Respiration (rpm)

- Heart Rate Variability (HRV)
- Stress (Baesky's and US/Euro-pean Index)

Heather Beardmore, CEO, SDG Group UK, comments: "Under the current sys-tem, diagnosing, monitoring and man-aging COVID-19 is contributing to its spread through contact. At present, individuals quarantined with suspected COVID-19 can record just one of the vital signs required to indicate the presence and progress of the virus, which is body tem-perature. The others – respiration, oxy-gen saturation, heart rate and HRV – are usually recorded by health professionals, potentially in densely populated locations and in close proximity to the patient. This puts primary care, community care and hospital workflows under immense pres-sure, places health workers and patients at an elevated risk and contributes to the spread of the virus."

Beardmore continues: "Docdot gives health workers the information they need to triage patients at a safe distance or in quarantine, preventing unnecessary visits to GP surgeries, triage stations and hospitals, and reducing the risk of expo-sure among health workers and vulner-able patients. This maximises the avail-ability of healthcare resources for those who need them most, and contributes to slowing the spread of the virus."

Docdot uses light signal processing tech-nology, or remote photoplethysmography (rPPG) invented and built by SDG's tech-



nology partner Binah.ai, a technique that enables a smart phone camera to record the light reflected by the blood vessels flowing beneath your skin. The blood volume in this micro vascular tissue varies in response to changes in respiration, blood pressure and other vital processes, allowing these variations to be converted, using proven parameters, into vital sign measurements. Independent clinical trials show over 90% of measurements to be as accurate as hospital grade monitors.

The data retrieved by Docdot is geo-ref-erenced and collected in real-time via

cloud architecture, which also enables the application of statistical-epidemiological modelling, useful for resource allocation planning and contagion forecasting.

The rPPG binah.ai technology powering Docdot has been extensively tested both internally at dedicated laboratories and in independent clinical trials at Indira Gandhi General Hospital in India (2019), Chiba University, Japan (2019) and currently at an FDA/Canada Health approved facility (2020). Research and testing continues with a sustained focus on achieving even higher levels of accuracy. ■

DataRobot and InterSystems Partner to Accelerate Adoption of AI in Healthcare

DataRobot and InterSystems have announced a partnership designed to accelerate the application of AI in healthcare. Through an integration and reseller agreement, the partnership makes it easier for InterSystems customers to integrate predic-tions and insights from DataRobot's enterprise AI platform into their healthcare applications.

The DataRobot enterprise AI platform provides automation across the entire AI lifecycle, accelerating and streamlining a user's journey from data to value. Through this partnership,

the enterprise AI platform will be integrated with InterSystems IRIS® data platform and InterSystems for Health, the world's first and only data platform specifically engineered to extract value from healthcare data.

"Healthcare is prime for disruption in ways that benefit patients, providers, and payers, and AI represents the next frontier," said Bill Hobbib, SVP of Marketing, DataRobot. "Our partnership with InterSystems makes it easier for users to leverage the power of AI to deliver high-quality care, improve patient experience and outcomes,

all while reducing the cost of care through AI-driven efficiencies."

DataRobot's enterprise AI platform will augment InterSys-tems' IntegratedML, a capability that gives developers access to AutoML capabilities directly from SQL. This allows InterSys-tems IRIS and IRIS for Health customers to embed predictions within their existing applications in a simple, intuitive, and scalable way. InterSystems' technology simplifies the data acqui-sition, normalization, and other "data wrangling," and DataR-obot's technology simplifies the entire AI process from feature engineering and modeling to deployment and monitoring. This will accelerate delivery and time to value of ML/AI capabilities in real-time decisioning applications.

"DataRobot's enterprise AI platform is a natural extension across all InterSystems deployments using our IntegratedML, both in healthcare and also in other industries," said Scott Gnau, head of Data Platforms for InterSystems. "This enables developers to easily include machine learning and AI extensions, creating real-time enhanced decisions and analytics for their applications. It makes operations robust as well. IntegratedML is built into InterSystems IRIS and IRIS for Health – a secure and reliable platform that runs many of the world's most health-critical applications, and DataRobot brings in best-in-class MLOps."



"At Baystate Health, we are focused not only on the 800,000 patients in Western Massachusetts, but also on turning data into insights that can help advance healthcare nationwide and around the world," said Joel Vengco, senior vice president and chief information officer of Baystate Health. "This partnership between DataRobot and InterSystems is an exciting one for us; it will put even more powerful tools in the hands of our develop-ment staff to create cutting-edge healthcare solutions." ■

New Secure Messaging Service 'Ready Doc' Enhances Collaboration

Intiva Health has launched an app-based version of its new HIPAA-Compliant Secure Messaging Service. Ready Doc™ Messaging, part of the Ready Doc suite of health care compliance solutions, enhances care team collaboration with real-time communications and stream-lined clinical workflow in order to improve patient outcomes and reduce the risk of a HIPAA compliance breach.

Ready Doc Messaging is a secure, encrypted application that protects patient information and meets HIPAA guidelines. Users are able to manage digi-tal PHI correspondence and streamline care team coordination via one accessi-ble, user-friendly platform. Common industry practices, such as the use of short messaging services (SMS) or personal electronic devices to transmit protected health information (PHI), opens the door for deficiencies in HIPAA compliance resulting in enormous monetary penalties for health care systems, which can range



anywhere from \$10,000 to \$50,000 per violation—with an annual maximum of \$1.5 million. A security breach of a patient's PHI can have life-altering conse-

quences for the individual, such as iden-tity theft and inaccurate medical records. Ready Doc Messaging offers a key feature set including: ■

- » Secure Messaging: All communication to and from the server is encrypted using TLS/SSL with authentication devices for client- and server-side.
- » Priority Messaging: High priority messages stay at the top of the recipient's inbox and specify a unique alert for instant differentiation.
- » Message Forwarding: Messages can be forwarded to other colleagues with ease.
- » Custom Groups: Customizable forum type discussions can be created for

- open and ongoing dialogue between colleagues and specific topics.
- » Delivery Confirmation: Receive notifications instantly when messages have been sent. Check read status and more.
- » Message Recall: Recall messages and attachments before they have been read.
- » Secure Attachments: Securely attach and share instantly any type of media.

The Ready Doc™ platform directly addresses the inefficiencies in health care credentialing. The platform presents an

all-in-one solution in which medical professionals can complete credentialing and compliance requirements, leading to a significant increase in earnings potential. The new features strengthen compliance risk mitigation and further expedite the credentialing process.

The mobile version builds upon the company's existing portfolio. A desktop version of Ready Doc™ has been available for use by care teams of any size since mid-March. ■

Skin Analytics Pilots AI Skin Cancer Community Assessment Service

University Hospitals Birmingham NHS Foundation Trust (UHB) and AI specialist Skin Analytics are to pilot a new skin cancer community assessment service to safely reduce delays in skin cancer detection and treatment during the Coronavirus pandemic.

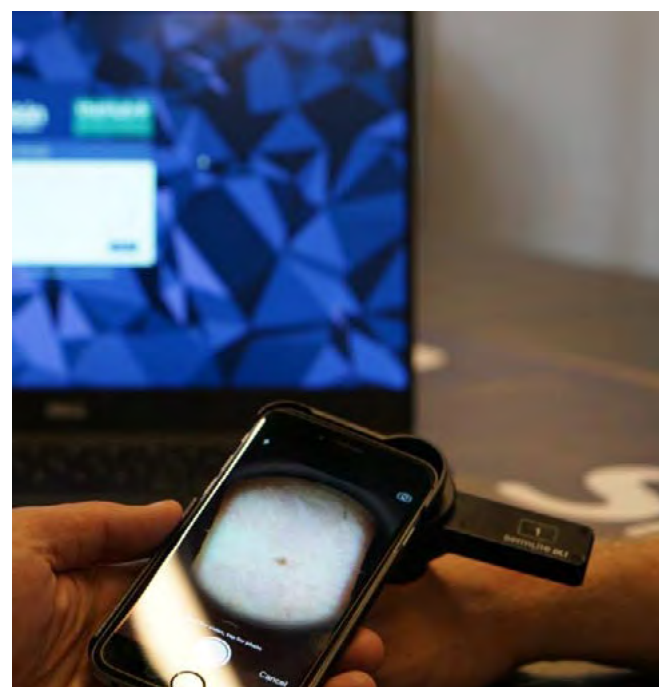
There are around 8-13 million GP appointments booked for skin cancer assessments every year across the UK. Around 16,200 people are diagnosed with melanoma, which is now the fifth most common cancer in Britain. While 2,300 people die each year, the survival rates improve significantly if the disease is caught early. By introducing a tele-dermatology service, UHB referred patients will have potentially cancerous skin lesions assessed and receive life-saving treatment sooner.

During the pilot, referred patients will be provided with skin cancer triage outside of the hospital setting, using AI technology to capture high quality images of those lesions which may be melanoma and requiring priority investigation by a Dermatologist, and those that are safe to defer according to the BAD guidelines. The service will help flatten the demand curve to manage the ongoing clinical risk when social isolation measures are lifted, and the latent demand is released.

If the pilot proves to be successful, it will be considered if this model of care can be continued past the Coronavirus pandemic for the benefit of patients in the future.

Nick Barlow, Director of Applied Digital Health, UHB said: "Identifying patients with melanoma over the coming weeks or months and providing treatment sooner will provide significant benefits. Managing the clinical risk and finding the patients who need treatment for melanoma will also be a key focus for hospitals well beyond the COVID-19 crisis. I'm incredibly proud of the way the UHB team worked with Skin Analytics to safely design and launch this pilot in just a few short weeks."

The AI triage service is powered by Skin Analytics DERM solution, a clinically validated, CE certified medical solution that can identify 11 lesion types including Melanoma, Non-Melanoma



skin cancers, Precancerous lesions and benign lesions.

Neil Daly, CEO of Skin Analytics said: "The AI triage pathway delivers two benefits for the health system through capacity and demand management for dermatology cancer services. It has been an incredible effort to get this service ready so quickly and is a great example of how well the NHS is responding to the challenge of COVID-19."

Patients who are concerned about a skin lesion or mole can be signposted to attend the skin cancer triage service. Patients attend the clinic, which has been set up so that the trust's clinical photographers work with Skin Analytics to safely capture an image of the patient's lesion which is then assessed by the AI solution and if the lesion is determined to be cancerous, a Dermatologist will remotely review and place the patient on the correct treatment pathway. ■

App Ensures Patient Access to Specialist Care during COVID-19

A health tech platform is reducing pressure on hospital services by enabling GPs and paramedics to screen COVID-19 patients in collaboration with specialists via an app.

Cinapsis, allows patients to be assessed by specialists as part of their GP appointment or 999 call response, enabling clinicians to pool their expertise and work together to support patients remotely.

The digital triage platform, founded by NHS surgeon Owain Rhys Hughes, connects primary care clinicians such as GPs and community lead nurses with consultants from the local NHS Trust who can provide advice about a patient's management in real time, including using images. This enables assessments to be made in situ, reducing unnecessary person-to-person contacts and patient trips to hospital.

With health professionals keen to stress that anyone with health worries should still seek help, the app means patients can continue to access consultant advice as part of their GP appointment.

In Gloucestershire, for example, Cinapsis is being used across the One Gloucestershire Integrated Care System (ICS) which includes Gloucestershire Hospitals NHS Foundation Trust, Gloucestershire Health and Care NHS Foundation Trust, South Western Ambulance Service NHS Foundation Trust, NHS Gloucestershire Clinical Commissioning Group and all of its 73 GP practices.

Thanks to this, some 32% of patients with suspected COVID-19 whose GPs or paramedics were able to offer alterna-

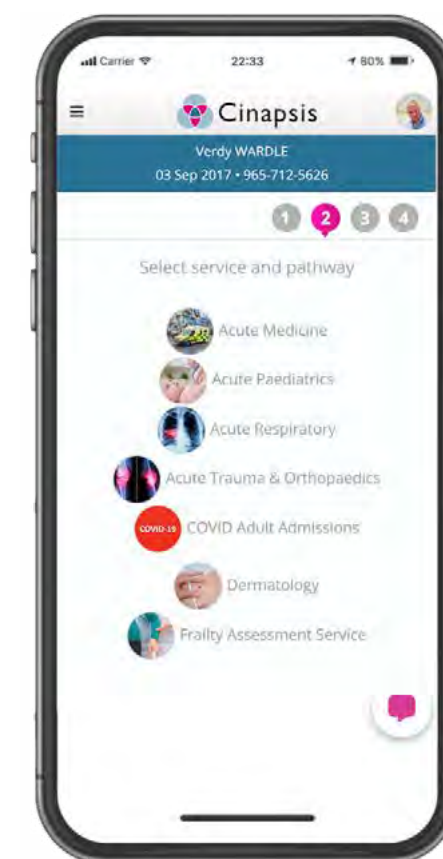
tives to hospital care were instead managed at home, relieving pressure on the NHS at this critical time.

Dr Malcolm Gerald, lead GP on the Cinapsis project in Gloucestershire, says, "Not only are we helping to reassure and better manage our patients by giving them the benefit of specialist advice, we are also reducing demand on busy hospitals by making properly informed decisions. Our data shows that following discussion with a specialist around a third of COVID-19 patients whose referring clinician had significant concerns about them did not need to be admitted to hospital. This has reduced unnecessary patient, family and staff exposure to the virus, whilst keeping important bed space free for those most in need."

Cinapsis is a smart referral system which uses a mobile or desktop app to seamlessly put primary care clinicians in direct contact with the right specialist via their mobile phone or a landline. It can also allow messages, images and video to be used – and all in a data-secure environment.

The referrer can make a single call, receive the best available advice, forward summary documents to the specialist and arrange transport if needed. Specialists can manage their rotas with ease, respond to calls quickly from wherever they are and then forward relevant information to the receiving department, sharing work across their team and prioritising cases.

All advice is recorded and an electronic letter summarising the consultation is sent to the patient's GP practice.



"At this critical time, Cinapsis is making it easier for GPs and emergency health-care workers to quickly identify the best course of action for any patient exhibiting symptoms suggestive of COVID-19, whether that's sending them to hospital or ensuring that they receive the care they need within their community. Local specialists can respond to questions from their colleagues in seconds and ensure decisions are made quickly, seamlessly and in the patient's best interests." Comments Founder and CEO of Cinapsis, Dr Owain Hughes. ■

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Implications of COVID-19 on the Global HealthTech Industry

The COVID-19 outbreak continues to rampage major cities, countries and continents across the globe. Apart from societies, COVID-19 has been equally devastating for major economies of the world, predominantly the healthcare sector. Prominent stakeholders continue to adjust their strategy with the rapidly evolving situation.

COVID-19 is expected to have major long-term consequences on the healthcare industry. Countries and key players will have to undergo crucial healthcare reforms once the crisis takes a back seat.

Technological advancements, cost control, and greater access will be indispensable part of healthcare reforms in foreseeable future.

Leading Pharmaceutical Companies to Benefit from Global Pandemic

In the light of ongoing disruption spurred by COVID-19, most companies would have to adopt new business models and philosophies for better management of potential outbreaks in future. Countries with enormous healthcare spending are likely to benefit from this pandemic. Companies are escalating the production of diagnostic tests and therapeutics in the race to effectively identify and treat patients suffering from this highly communicable respiratory disease. Eventually, the company which successfully develops and launches vaccine for COVID-19 would cross the finish line. However, a commercially viable vaccine is still 12-18 months away. Leading pharmaceutical companies are receiving impetus from governments to accelerate the human trials of vaccine.

Besides, other companies which are likely to benefit from this pandemic are those which produce ventilators, hospital beds, face masks, safety gears, and other medical equipment. However, with numerous countries banning the export of medical equipment, the global supply chain has been severely affected. The domestic production on the other hand continues to



surge with several entrepreneurs offering to manufacture medical gears and equipment.

Hospitals Continue to be Overwhelmed with COVID-19 Patients

Hospitals are the worst affected by this pandemic. COVID-19 has taken a huge toll on healthcare professionals, particularly in developed countries such as Italy, Spain, France, and the United States. Healthcare experts fear that developing countries might be on the same trajectory where the outcome can be even worse in the absence of proper health infrastructure. Patients with existing conditions are experiencing delays in elective surgeries with doctors and nurses working non-stop to treat COVID-19 patients. Lack of liquidity and administrative overload are causing delays in reimbursements as well. These are short-term consequences which the healthcare industry is already witnessing.

Long-term Consequences of COVID-19: Reprioritisation of Healthcare Agenda

In the next 6-12 months, major players would have to expand their capacities and divert most of their human and financial resources towards COVID-19 management. Funding will continue to be a major constraint in the effective management of COVID-19, particu-

larly making the vaccine accessible for the poorest of the poor. The current pandemic has exposed critical shortcomings in healthcare infrastructure, even in countries with world-class medical facilities. When the crisis subsides, countries will have to reprioritise their healthcare agenda. The future reforms will be centred on cost, coverage, and quality of healthcare. With more political support, healthcare industry is likely to carve out major chunk of resource share in foreseeable future.

Digital Health: Future of Healthcare

In the midst of current outbreak, digital health and telehealth have taken a front seat. COVID-19 has reemphasised the importance of remote diagnosis, consultation and treatment. Regulatory and behavioural obstacles have been slowing the growth of telehealth in the past few years. However, with many healthcare providers giving consultation over video conferencing and phone calls at present, the growth of this segment will augment many folds within the next two years. The social distancing measures have mandated patients with mild symptoms to opt for remote consultation. Further, it greatly reduces the burden on hospitals already swamped by scores of COVID-19 patients. The pandemic has led to major resource constraints. This will lead to development of alternate pricing models and value-based pricing.

Preventive Healthcare System: Backbone of True Public Health

The repercussions of COVID-19 will be felt for many years to come. The outbreak has stressed the need for detecting the onset of such pandemics beforehand and brace for impact. The under preparedness has cost thousands of life and pushed the world economy into recession. Moreover, the protection of front-

line health workers is a paramount matter of concern which will shape government policies in future. Preventive care should be the basis of effective healthcare systems. However, this transition will be complex, and should be carried out in phases over the next few years. Health leaders emphasise that psychological and financial depletion of healthcare systems are likely to escalate this transition. Preventive healthcare system will completely

change the way healthcare services are measured and delivered.

About the Author

Sabyasachi Ghosh heads FMI's healthcare, pharmaceuticals and medical devices domain. The insights presented in this article are based on FMI's research findings on Healthcare Robots Market Study of Future Market Insights ■

It's Time to Start Combatting the Collateral Damage of COVID-19

These past few months have seen the whole nation coming together to adhere to social distancing rules thus having the desired effect on reducing NHS pressure, as the government reports A&E visits halving. But, these drastic changes also highlight a significant cause for concern; the public – particularly those identified as vulnerable – are too scared to seek medical attention in fear of contracting Coronavirus, or being a 'burden' on the overstretched NHS, with four in ten choosing not to seek help for this reason.

Although the government is urging people to continue to seek medical help when needed during the pandemic, without the correct safeguarding solutions in place – lives will be lost.

As Helen Dempster, Chief Visionary Officer, Karantis360 explains, even after social distancing restrictions begin to lift in the UK, many of the older generation and vulnerable individuals will be too frightened to seek medical advice in fear that they will be expected to leave the safety of their own home. Meaning even the most treatable of illnesses could escalate into an avoidable situation.

While we know staying at home is the recommended option for vulnerable individuals and older adults given the current crisis, and more importantly the preferred long term choice of 97% of people aged 68+, how do we truly ensure that they are being kept safe at home?

Preventable escalation

Early detection of illness or infection among those identified as vulnerable can mean the difference between life and death. But often the VIP may not even be aware of their symptoms, or they are too frightened to ask for help in fear of being admitted to hospital, which in many cases results in the issue escalating and remaining unnoticed for too long.

Proven technology, such as IoT systems, provides a non-intrusive safeguarding solution. Deploying sensors throughout the home to monitor the habitual routine of the VIP, provides real-time information that may be of either reassurance or concern to families, carers, and doctors – enabling them to react accordingly



and swiftly. Common problems such as Urinary Tract Infections (UTIs) can be detected and treated rapidly – minimising the risk of the infection escalating to a critical point that requires a visit to A&E and possible hospital admission.

Combatting social isolation

With 3.6million of the elderly living by themselves and 1.9million saying they often feel alone or invisible, the current situation is only going to exacerbate this. Carers can play a key part in reducing feelings of loneliness; harnessing technology facilitates carers to confidently monitor how well their client is doing at home, and organise their visits more effectively. As a result of this carers can provide a more personalised care experience, as well as, asking more well-informed lifestyle questions and identify any problems faster. Furthermore, the system has also been proven to reduce carers' administration time by 50% allowing them to spend quality time caring and interacting with their VIP.

Visibility and feeling connected to their relatives has also become a concern for those whose loved ones are isolating and being cared for in their own homes, often creating unnecessary mental stress for all parties. While it may be difficult to reduce the distance between a family member and their loved one, technology has the opportunity to bridge that gap and create a visible, personalised service that will suit both the client and relative's ➔

individual needs. Loneliness is a complex issue to solve but little changes can make a big difference.

Reducing pressure on the care ecosystem

The current Coronavirus crisis has resulted in the NHS turning its attention to technology to help alleviate pressure. While it's unfortunate that it's taken a global pandemic to start implementing digital solutions – it's a lesson for the future.

By 2030 it is estimated that the world will need 80 million health workers to meet the demands of the global population, but the reality is that the world will actually be short of 15 million health workers. As the population continues to age, the strain on the health system increases still. The future of healthcare looks bleak if we do not start making changes and learning from these global catastrophes. Social care needs to start harnessing technology now if our loved ones are to receive the care they deserve, not just in the short term, but for the generations to come. ■

How Technology Supports the Detection and Diagnosis of Cardiac Conditions

Justin Hall, Vice President and General Manager EMEA, iRhythm Technologies discusses how AI-driven solutions are making it possible to provide earlier warning signs, enabling the identification and management of patients who might otherwise be undiagnosed with a heart condition.

We're currently seeing some very practical and positive cases of artificial intelligence being introduced across healthcare – how can AI technologies benefit cardiology specifically?

Today, artificial intelligence can help doctors to monitor, assess and diagnose many different kinds of conditions. Enabled by deep learning algorithms, such technologies have been shown to reduce the number of patient appointments, improve current detection methods and encourage a digital-first approach to healthcare. It's no wonder that a recent report from MIT Technology Review discovered that 79% of health-care professionals are increasing their budget for AI applications in 2020.

For cardiology specifically, these advancements have allowed for the development of new methods of monitoring for serious heart conditions, changing standards for both patients and practitioners. Cardiac monitors, for example, are now powered by the world's largest heart-rhythm databases and can support the detection of serious conditions with greater accuracy. Poor signals and loose wires – both of which have previously caused critical knowledge gaps in the data gathered – are no longer an issue, therefore revolutionising the amount of time it takes to



support a detailed and exact diagnosis.

These modern, AI-driven solutions are making it possible to provide earlier warning signs, enabling the identification and management of patients who might otherwise be undiagnosed with a heart condition, until they have a cardiac event, such as a stroke. This actionable heart data and early detection have the potential to lower hospitalisation rates for the NHS, while providing a better standard of care for patients.

What are the obstacles that both practitioners and patients face currently when it comes to detecting and diagnosing cardiac arrhythmias? How is iRhythm effectively overcoming them?

Now tasked with seeing more patients in less time; healthcare professionals need assurance in the methods they are deploying in order to diagnose cardiac

arrhythmias. Part of the current problem, however, is that existing – and in many cases, outdated – processes are neither quick, nor completely accurate.

Take atrial fibrillation (AF), for example; a vascular condition that is known to increase a patient's stroke risk by five times, and therefore contributes to just under one in five strokes in the UK. According to one study, the traditional and widely used Holter device captures only 47% of arrhythmias due to its short, inconsistent wear time.

With an incomplete and unrepresented data set, clinicians may not have enough data to feel comfortable relying on the information gathered to form an accurate diagnosis. This could lead to patients having to schedule multiple appointments before an arrhythmia is discovered and managed – resulting in potential critical health impacts, as well as repeated pressure on the NHS.

iRhythm's Zio service involves using a small wearable heart monitor that attaches to the patient's chest for 14 days, using a biosensor while the patient goes about their daily life. Part of the analysis process uses cloud-based data analytics, with proprietary algorithms, that take data from millions of previously tested heartbeats.

Compared to traditional cardiac monitoring devices, the Zio service streamlines the patient diagnostic journey – ensuring patients and clinicians get the answers they need for the right treatment path. Recent data, taken from a mHealth Screening to Prevent Strokes (mSToPS) trial has shown that Zio enables a more targeted detection of silent AF in an at-risk population,

resulting in a significantly higher rate of AF diagnosis (3.9%) than in those who received routine care (9%).

What does the future roadmap look like for iRhythm?

Ultimately our goal is to redefine the way in which arrhythmias are diagnosed, making detection faster and more efficient. Our roadmap – which we hope will enable us to achieve this – is probably best spoken about when broken into short term and long-term objectives.

In the short term, we are scaling our UK business in order to reach and help more patients within both the National Health Service and private sector. We have submit-

ted to NICE, on an accelerated pathway for innovative technology, which should help patients access our service once the NICE process has successfully completed.

Long term, we continue to increase our network in order to address the needs of the millions of patients living with undiagnosed atrial fibrillation. Our recent partnership announcement with Verily – which brought together our expertise in artificial intelligence enabled arrhythmia diagnosis and Verily's advanced health data analytics – is an example of how we hope to achieve this. When it comes to detection, time is of the essence – the earlier patients are diagnosed the quicker they are put on the right treatment path. ■

Redesigned Cancer Pathway Delivers Faster Results Using Innovative Imaging Tech

Patients who do and don't have bowel cancer are notified much sooner as radiologists at the UK's University Hospitals of North Midlands transform pathways and innovate with imaging technology.

Patients undergoing CT colonography scans are being quickly notified if they do or do not have bowel cancer, following the implementation of imaging technology that has given staff at University Hospitals of North Midlands NHS Trust the opportunity to redesign pathways.

The trust first went live with its picture archiving and communication system, or PACS, from Sectra in 2017– providing health-care professionals with much faster access to imaging necessary for making important diagnoses.

Radiologists have found the imaging technology so reliable and easy to use, that it has freed up their time to get the most out of the system.

And this now means that referring clinicians are being consistently notified on the same day as the patient's CTC scan, also known as a virtual colonoscopy, if their patients test positive for bowel cancer.

Dr Ingrid Britton, consultant gastrointestinal radiologist, at University Hospitals of North Midlands NHS Trust, said: "We can now identify patients with colorectal cancer whilst they are still on the scanner. Previously the radiographer would perform the scan, and then place imaging in a queue to be reported by



a radiologist, before the report would be sent onto a multidisciplinary team.

"Now, when radiographers see something during the scan, they alert the imaging team immediately, and using a simultaneous viewing feature in our PACS, radiologists can immediately look at the imaging from their own location and report as the image is generated, before notifying the referring clinician the same day when a patient is positive.

"If a patient knows straight away, they have faith in the service. Getting this right from the beginning gives the patient confidence. This wouldn't work with a system where the technology doesn't load quickly enough."

Patients who show no signs of bowel cancer are also being notified and discharged weeks sooner in a new pilot project at the trust – helping to avoid any unnecessary anxiety for the patient.

Traditionally if a scan doesn't show signs of cancer, the imaging joins a queue to be reported. Once a radiologist has done the report it is sent to a surgeon's secretary, who then gives it to the surgeon. The surgeon dictates a letter, which is written by the secretary and eventually sent to the patient.

“That whole loop can take around three to four weeks, or in some cases months, during which time patients are worried they may have cancer,” said Dr Britton. “The 97% of patients we see who don't have cancer need to know quicker. Our pilot project is changing that. If I know the patient doesn't have cancer at the point of my report, I now issue a standard letter directly to the patient from our multi-disciplinary team telling them so. We are now discharging patients from scan to report in around 16 days – meaning patients know they don't have cancer days or even weeks earlier, putting their mind at ease, and saving time as the patient isn't chasing their GP.”

The developments come as recruitment challenges and continually growing demand are leaving many NHS imaging departments struggling to manage reporting backlogs.

A 2018 report from the Royal College of Radiologists found that 98% of trusts were unable to meet their reporting requirements within radiologists' contracted hours, and that demand for com-

plex imaging scans such as CT and MRI had increased by 10% per year for the previous five years. And a separate report from the Care Quality Commission found huge variation in reporting delays, calling for local and national action to address the problem and to keep people safe from harm.

The new approaches also come as a new national target for patients to be told whether they have cancer is set to be put in practice by NHS England and NHS Improvement in 2020.

Dr Marius Grima, consultant paediatric radiologist and clinical information officer for children's, women's & diagnostics division at University Hospitals of North Midlands NHS Trust, said: “This is about making the most of technology so that we can cope with growing demand, meet national requirements and help to improve care – escalating patients who do have colorectal cancer, and quickly de-escalating those who don't. Our imaging technology works so well, and is so reliable that we no longer need to think about IT. This means that we have the bandwidth to think about using the system to the full, and to change our pathways to improve the patient's experience.”

Jane Rendall, managing director for UK and Ireland at Sectra, said: “Ingenuity demonstrated by healthcare professionals at University Hospitals of North Midlands is what technology in the NHS should be about. It's not about IT. It's about how people can use it to deliver better patient care, and a better patient experience. I hope other hospitals can replicate this success to spread the same benefits to many more patients.” ■

Transforming the Patient Experience

By Claire Biot, VP Life Sciences Industry, Dassault Systèmes

The world around us is evolving at a rapid pace. From industries, to jobs and the technology we use, businesses are constantly transforming to set new standards and exceed consumer expectations. Regardless of the industry, automotive, retail or even healthcare, the appetite for innovation and new technologies is greater than ever.

For years, the healthcare sector has had to rely on lengthy testing phases, slow product developments and costly patient trials, meaning that new treatments and devices typically took years or even decades to come to market. However, the rise of cloud-based services, robotics, automation, virtualization and 3D printing has opened the door for more innovative treatments and delivery systems

created through sustainable product development and increased collaboration across the value chain.

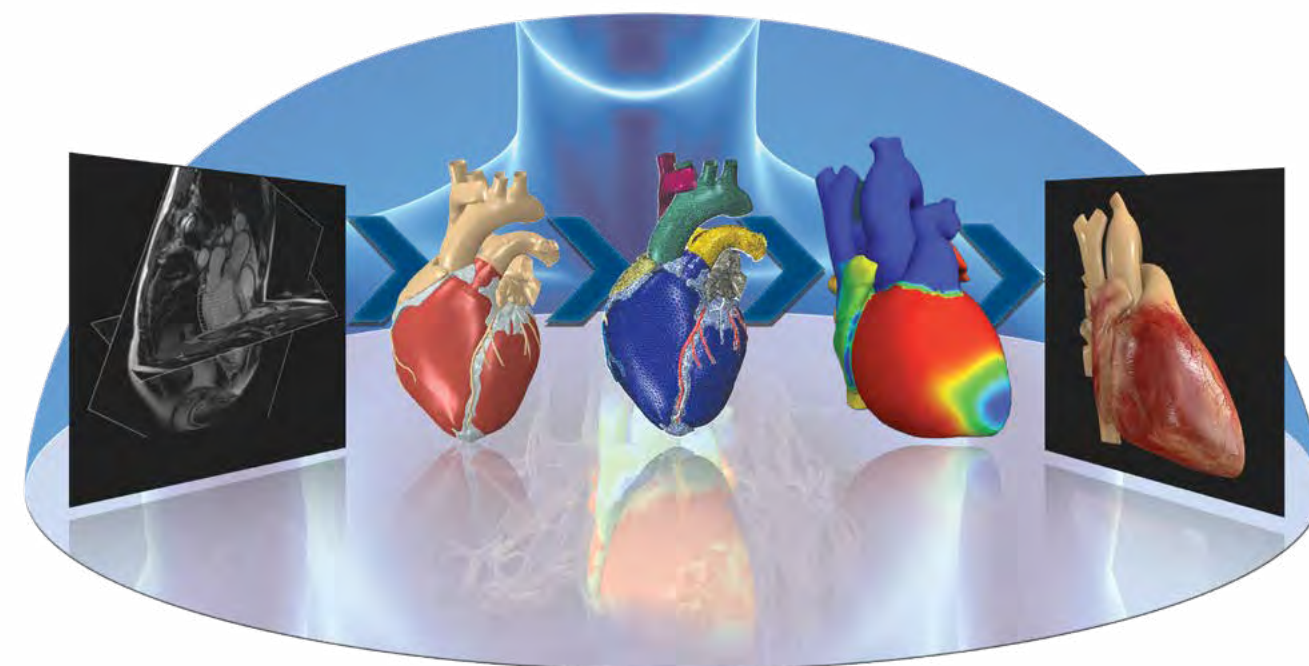
Private sector input into public healthcare, driven by increasing consumer demand and a mandate to offer more effective ways of saving lives, is improving both short and long-term patient care. As technology continues to evolve and patient demands shift, we'll see more tailored solutions reaching a wider network of patients, ushering in a new age of modern medicine and care.

What will the shift in healthcare mean?

Patients nowadays are looking for bespoke care, tailored to their specific needs delivered to them where it is most convenient. They are more informed about treatment options and come armed with

personal data and a willingness to share it in exchange for the best experience. To manage increased complexity and drive this systematic shift in patient care, the healthcare sector needs collaborative and sustainable innovation partnerships to enable value chain transformation. Developing medical treatments has never been easy, fast or inexpensive and the cost of a mistake can be profound. However, there are ways to reduce costs, risks and time to market. We're now seeing more public and private health organisations turn to intuitive virtual platforms to address common issues with bringing devices, drugs and various other treatments to market sooner.

3D design and virtualisation platforms offer the necessary collaborative tools for fluid sharing of information throughout the development phases, critical for delivering the best product possible. They help



to identify and minimise design or manufacturing faults, reduce the potential of adverse side-effects and lead to improved patient outcomes. Faster research, product development and custom manufacturing processes help medical R&D teams bring life-changing treatments to patients quicker than ever before.

Dassault Systèmes is a key partner to healthcare organisations around the world, helping to accelerate the development of clever new solutions overcoming the traditional constraints of physical product testing. Our 3DEXPERIENCE platform is designed to bring together all key stakeholders to collaborate on the design, development and deployment of medical products. Curating products, devices and treatments through virtual environments offers new perspectives and insight into this process, giving scientists and engineers a 360-degree view of how they are produced and brought to market.

Sustainable innovation put into practice

The IASO project, named after the Greek goddess of recovery, is a showcase example of how sustainable innovation and collaboration tools can come together to put patients at the heart of medical care innovation. Designed to demonstrate the value that the 3DEXPERIENCE platform can bring to Life Sciences companies, IASO represents a next generation delivery system for oncology care. Its

high-tech, high-volume wearable injector collects patient data on heart rate, sleeping patterns and eating habits. By collating real-world patient data, devices like this can identify the patient's reaction to a specific treatment, notify them of when they need to take prescriptions and, in the case of chronic diseases, even collate information about remission, so patients can be treated urgently and limit the progression of the disease. By unpeeling the layers required to deliver a game-changing patient experience, manufacturers will immediately see why this is the future of medicine.

For patients living in parts of the country where accessing a clinic can prove a challenge, home treatment is hugely beneficial. In urban areas where patients can sometimes wait weeks before seeing a GP, these bespoke medical solutions limit the need for patients to visit a clinic or A&E. Instead, the device can help with self-diagnosis, allowing more medical specialists to utilise the full potential of telemedicine.

IASO was made possible through use of Dassault Systèmes game changer collaborative virtual experience platform. Creating new devices virtually means that new ideas and creations can be continuously trialled and adapted. Use of this puts sustainability at the heart of innovation easing the burden on public healthcare resources to find new treatments more quickly, and lessens the need for collaborators to travel as all changes and designs are digitised for ease of access.

Creating a roadmap for the future

The future of healthcare is personal.

The future is now. Today's consumers are demanding personalised healthcare experiences with increased innovation and improved safety. Traditional reactive, one-size-fits-all therapies are no longer enough. Personalised, preventative and value-based healthcare are rapidly becoming the norm. Commitment to a value chain transformation is crucial for manufacturers to keep pace.

Technology, of course, is essential to advancing this future. The arrival of new technologies and new infrastructure including telemedicine, virtual patients and ultra-connected collaboration is enabling closer working relationships between all stakeholders. More powerful applications will emerge with the capability to realise the full potential of these futuristic therapeutics.

Cost effectively creating and delivering a treatment for a population of one is no easy challenge. A virtualisation platform that breaks down the silos will increasingly allow tailoring of care to the individual when and where they need it. This further engages the patient and involves them more in their own healthcare treatment. Ultimately, this will help drive macro-efficiencies within healthcare, leading to more accurate use of overall resources. Commitment to this shift in patient care will ensure a future that is more dedicated to the innovative treatment needed by modern patients in the modern world. ■

Burnout in Health Startups

Are Corporate Partnerships the Answer?

By Dan Boot, Head of Digital Innovation at RB Health

We're obsessed with monitoring our own health. So much so that it's hard to believe that Fitbits and smart watches were once a novel concept. In 2014, only 9% of us regularly used a wearable. Fast-forward to 2018 and that figure jumps to 33%. Now, 80% of us are willing to wear a piece of technology that tracks our fitness levels.

With consumer appetite and the growth potential for businesses entering this space huge, it's no wonder that the number of health, beauty and fitness start-ups boomed by 34% in 2018.

Every day we're seeing new companies emerge with the intention to help people live better. The innovators behind them work tirelessly to bring something new, exciting and of genuine consumer value to the market; yet these innovators often let their own health take a hit in the process.

RB, in partnership with Startup Grind, recently surveyed digital health and health start-up founders on this topic, finding that over half of them (76.1%) attribute personal health issues to their jobs. We cannot overlook a statistic like this. It raises questions about the daily demands of running a health start-up – and causes doubt regarding the longevity of these important businesses.

If start-up leaders want to maintain their health while seeing their business thrive, they need to consider how they can take some of the weight off their shoulders. This is where corporate partnerships can help.

What's behind start-up founders' declining health?

Long hours are largely to blame. On average, UK workers put in 37.1 hours a week. But our research found that 42% of health start-up founders work 50 plus hours a week, and 17% work 60 hours or more.

These long hours come as little surprise, as getting a successful business off the ground is a demanding task. For nearly half of health founders (44%), securing funding and maintaining healthy cashflow is the top stressor. Legal and regulatory concerns, alongside product and research development, also sit heavily on a fifth of start-up founders' minds (20.4%).

These problems can take their toll on the health of founders. Over half (55.6%) experience a raft of health ailments as a result of starting out on their own. Poor sleep is the most common issue, suffered by 16.4%. Headaches and migraines come in second place, suffered by 14.9%, and mental health complaints third, with 10.4% of health start-up founders developing issues such as stress, anxiety and depression.

To put this in perspective, only one quarter (23.9%) of health start-up founders report that their line of work has no negative impact on their health.

These are concerns faced by business owners across the board; but they are likely to be felt more acutely by health start-up founders. First, start-ups are smaller than the average business. This may make them more agile, but it also means they have a smaller pool of in-house expertise to draw on when facing obstacles on the road to success. The number of support relationships they have access to is also far lower than those available to their larger organisations.

Second, health startups operate in an environment with far more stringent regulations than many other industries. Whether its software or medical devices, health startups must adhere to risk assessment and regulatory guidelines when developing their solutions. This applies to all products that provide information used to make decisions with diagnosis or therapeutic purposes. The task is made all the harder by the lack of a 'regulatory sandbox', as there is in sectors such as fintech.

Without the right expert support, startups founders can quickly become frustrated by the wealth of risk and regulation documentation required by the health industry.

Battling burnout in start-ups is vital

The health industry contains numerous large-scale, long-established businesses. They have a wealth of expertise, alongside advanced R&D facilities that most start-ups do not have access to. However, start-ups have the drive, agility and creative thinking to make a profound impact on people's lives, quickly. In this way, they can set themselves apart from their larger competitors. Today, bringing industry-leading health products to market requires a combination of the two.

Since 2016, RB has hosted multiple Innovation Hacks to demonstrate the power of collaboration in the healthcare sector. At this year's Startup Grind conference in San Francisco, we partnered individuals from our internal innovation teams with representatives from some of the most promising health and healthtech start-ups.

We tasked three teams with developing a solution to support mood and cognitive function in new mums in the US. The ideas that came out of the 24-hour period were incredible – ranging from a platform to connect new mums with peers and health professionals, to an essential oils dispenser to help soothe new mums.

The exercise proved a great example of how fruitful collaboration can be when partners are on the same page and unified by a



common goal. However, realising the broader potential of these partnerships is only possible if we tackle the negative health impacts of running a business.

We should help health start-ups capitalise on their desire to improve people's lives. Two-thirds (66.7%) of founders cite this as the primary reason for starting a health business. It's a powerful motivator – but stress and burnout must not become detractors.

If health start-up leaders achieve more balance, they will start to feel the benefits of launching a business. In fact, many founders experience an improvement in their personal lives as a result of starting out on their own. Over a third (36.1%) report being in a better position financially, while exactly half say they have a better work-life balance than before.

So how can we ensure that all start-ups reap these benefits and are in the best possible position to innovate?

Providing the right support

Health corporates can support start-ups in the field by entering mutually beneficial partnerships.

Over three-quarters of health start-ups (77.8%) would consider partnering with a corporate to develop their solutions; the reasons why are manifold. The foremost is that corporate partnerships provide access to expertise across many different areas, from regulation to marketing and the supply chain.

The good news is that opportunities for these collaborations are

plentiful, as many established organisations are seeking start-up partners. The success of these relationships will depend on both parties being transparent in their expectations and developing a mutual understanding of each other's capabilities.

The fact that health corporates and start-ups have a common desire to improve lives is a solid starting point; but further relationship building is key for dismantling potential obstacles further down the road. For instance, over half of start-up founders (59.3%) would shy away from a corporate partnership for fear of process, bureaucracy and lengthy decision-making slowing them down. However, corporates have lengthy processes because they have a lot to lose if errors occur – and it's important that the reasons behind this dynamic are clearly communicated to potential partners.

Making a success of these relationships and getting those life-changing products to market, requires reasonable give and take from both sides.

Final words

Partnerships are the future of consumer healthcare. Together, start-ups and corporates can identify unmet needs in the market and have the expertise, resources and agility needed to satisfy them.

In this mission, we must take care to support founders. Creating products that improve everyday health is important – but it is a demanding task and it should not be done at the expense of founders' own wellbeing. ■

Driving Health IT ROI with a Digital Learning Platform

Evidence is mounting that the training staff receive on major healthcare IT systems impacts on their deployment and adoption. Yet traditional classroom and e-learning won't always provide what is needed.

Organisations can improve the operational efficiency of their training efforts and increase end-user proficiency by adopting a digital learning platform that integrates with their EPR and delivers in-app support to people when they want it, as EMEA sales director Jonathan Pascall explains.

NHS organisations can invest millions of pounds in electronic patient records and other IT systems. Yet deployments can fail and expected benefits can fail to materialise if staff are not engaged with them and effectively trained on them.

The KLAS Research Arch Collaborative, a provider-led effort to unlock the potential of electronic health records that works across ten countries, has found that the single, biggest predictor of how highly users rate their EPRs is how highly they rate the quality of the system-specific training they received.

Unfortunately, we know that NHS organisations can face significant challenges when it comes to delivering timely and effective training ahead of major system deployments. They may face a degree of resistance from staff who have been through implementations from which they have not seen any benefit, or who simply struggle to fit training into their busy work schedules.

Even when they attend traditional classroom training sessions, staff may be given the basics, handed a manual, or encouraged to take part in an e-learning course, in the hope that this will be enough to reinforce what they learned, sometimes weeks before a planned go-live.

Fortunately, we also know that a comprehensive digital learning platform, such as uPerform from ANCILE, can have an



immediate and demonstrable impact on the training that staff receive and so on the successful adoption of major IT systems.

Making the business case for a digital learning platform

A successful platform will include easy integration with an EPR system, so workflows can be recorded and turned into a range of training materials that staff can then access from within the EPR itself.

This saves time, reduces reliance on classroom training and additional support resources, and reinforces what staff have learned as they go about their work, day to day. To quantify these benefits, ANCILE worked with Hobson & Company, a research firm focused on return on investment and total cost of ownership.

Hobson & Company conducted six, in-depth interviews with US healthcare customers for uPerform, and then conducted an ROI analysis. It calculated that a healthcare network with 10,000 EPR users could expect to see a payback on the system in 7.8 months and generate an ROI of 397%.

Or, to put it another way, that customers saw measurable benefits, with a high return on investment, by addressing the challenges that they have in common with the NHS.

Increasing operational efficiency

Specifically, Hobson & Company confirmed that uPerform can save time for authors and administrators. Creating a training course without a digital learning platform can be a time-consuming process that requires numerous recordings, documents and applications; all of which can be hard to maintain and use consistently.

With uPerform, screenshots, actions and keystrokes can be captured from within the targeted application. Recordings are held in a central database, from where they can be published in a variety of standardised formats, which can be easily updated if there is a system upgrade or other change.

The customers interviewed by Hobson & Company reported the potential for a 50% reduction in the amount of time spent authoring and administering content.

The researchers also confirmed that uPerform can reduce the need for, and so the cost of, instructor-led learning; by as much as 40%. And they confirmed that because uPerform enables staff to access training and learning materials from within the EPR, they can spend less time in classrooms and on e-learning courses.

The customers interviewed identified the potential for a 45% reduction in the time learners needed to be away from their jobs.

In addition, because staff can hit the 'help' button when they need it, customers identified the potential for a 40% reduction in the number of calls to help desks. One digital learning lead said: "We were having 4-5 training related calls a day, and now it's down by half."

Increasing end-user proficiency

Most importantly, Hobson & Company looked at how a digital learning platform like uPerform can support staff engagement with and take-up of EPR systems.

Customers reported that staff are more likely to follow best practice and less likely to formulate their own 'workarounds'. Yet, because it is easy to author content in uPerform, clinical enthusiasts and super-users can create their own materials and pass on tips and tricks.

Staff can also 'sign up' to their favourite content, and receive notifications about

changes and new features, so they can train on them proactively. And some organisations have used uPerform to address the challenge of onboarding staff and locums, by giving them access to training materials before they arrive on site.

The customers interviewed reported that there is the potential for an increase in the adoption of mission-critical software each year. One said: "The biggest benefit to using uPerform is to be able to create... a proficiency continuum for your employees – you can take a user from a novice to an expert."

Driving ROI through successful deployments and ongoing adoption

When IT leaders hear the words 'learning' and 'training', they may think that we are talking about something that does not affect them. However, it is clear that learning and training are critical to the successful deployment and adoption of major IT systems.

The Arch Collaborative argued that many current EPR challenges could be eliminated if health care organisations offered high-quality educational opportunities for their users; and that needs to mean using modern, digital solutions that work for staff in day to day care.

The research that Hobson & Company have done on uPerform shows that it can increase operational efficiencies, by reducing the amount of classroom and e-learning that staff need, reducing the time that educators spend creating engaging, high quality content, and cutting help-desk calls.

It also shows that investment in uPerform can deliver a payoff in terms of engagement and optimisation of those expensive and increasingly mission-critical healthcare IT systems. It isn't possible to have your staff supported by floorwalkers or the IT training team 24/7 forever; uPerform may just be the next best thing. ■

Safeguarding Healthcare Security for the Future

By Tristan Liverpool, Senior Director of Systems Engineering, F5 Networks

While the healthcare sector's digital transformation journey is well underway, its progress could still be derailed by a lack of cybersecurity awareness and investment.

2.7 minutes' worth of damage

Cutting cybersecurity corners is simply not an option in the healthcare space, and there are significant humanitarian and ethical dimensions to consider.

The consequences are immense if anything goes awry.

A recent study by Vanderbilt University's Owen Graduate School of Management found that it takes healthcare facilities hit by a data breach or ransomware an extra 2.7 minutes to respond to a patient with a suspected heart attack. This could result in as many as 36 additional deaths per 10,000 heart attacks that occur each year. The study also found that at least 10% of the more than 3,000 Medicare-certified hospitals on the US' Department of Health and Human Services (HHS) list were hit by a cyberattack.

Then there's the WannaCry ransomware cryptoworm that hit the NHS hard in 2017. Appropriate security patches had previously been pushed out but remained ineffective without

machine reboots. The clean-up cost? Around £92m.

Unsurprisingly, healthcare organisations conform to strict regulations. The NHS has specific security policies in the UK and so does the US via the Health Insurance Portability and Accountability Act. There are many others across the world, all of which tend to be designed for rigorous data privacy. Patient data should only be accessible on a need-to-know basis and patients must have control over how their data is used and what is kept on file.

That might sound reassuring in theory, but it is far from enough to keep determined cybercriminals at bay.

All hands on deck

One of the weakest links in the cybersecurity chain is human error. The IT team can't cope alone, and every employee needs to buy in to a security-first culture.

Phishing remains an enduring favourite to catch people out. Based on analysis from the past year, F5 Labs believes phishing is now the most prominent attack method used to breach data, with the healthcare industry one of the most at risk (rubbing shoulders with other prone sectors like finance and education).

Attackers don't have to worry about hacking through a firewall, finding a zero-day exploit, deciphering encryption, or rap- ➡

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