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The Journal of mHealth

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In This Issue

Welcome

As health organisations continue to move toward value-based care, there is a pressing need for intelligent solutions to meet the challenges care providers face in improving diagnosis and treatment, enhancing patient and staff experiences and reducing costs.

People, Data and Technology are the future of healthcare delivery. Each is becoming ever more dependent upon the other two, and it is only through the implementation of strategies that balance these elements that meaningful improvement can be achieved.

In this issue we consider the role technology can have in improving the connections within healthcare systems. We discuss how data can flow between systems and different stakeholders, and we highlight the importance of the human factor. Technology and data should be enabling clinicians, and patients, to make better informed decisions, to communicate in more effective ways and support the delivery of care, but the human factor should always be the starting point.

We begin our discussion with an insightful feature that considers the concept of the 'smart' ambulance, and how 'data-empowered' paramedics, and innovative technology, can work hand-in-hand to shape the future of the ambulance service.

David Southern, managing director Spirit Access and Emma-Jane Roberts, managing director Spirit Digital, outline how collaboration across the healthcare spectrum – from pharma to commissioners, primary care and patients – is key to maintain long-term patient health and wellbeing, and develop new ways of working to leverage capacity in a shrinking work force.

We also speak to Greg Makoul, Founder & CEO of PatientWisdom, an expert in doctor-patient communication - who is internationally recognised for radical common sense and taking a patient-centered approach to innovation - about how patients are the real key to improving health and care.

And finally, as part of our Executive Series - which includes insight and expert opinion from leading figures across the HealthTech industry - we spoke to Tim Davis, Vice President, Digital Patient at ERT and Alex Butler Co-founder of Foundry[3] to discover how they are collaborating to deliver rich, adaptive digital health programs to help patients better manage their conditions and ultimately improving health outcomes.

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The Vision of 'Smart Ambulances' goes Hand-in-Hand with a Data-Empowered Paramedic

Automatically capturing and sharing rich event driven data from scene to the next level of care enhances the focus on delivering high quality care.

By Graham Murphy,
BU Leader of RDT – a Philips Company

The healthcare sector is in the midst of a technology revolution. The NHS has embedded technology integration into its long-term strategy, with particular emphasis on innovative technological approaches to improve efficiency and sustainability, empower patients and improve their experience.[1,2] Technology has also been recognised as one of the two fundamental 'enablers' of a more effective ambulance service.[3]

The second enabler is staff.[3] The role of the paramedic has evolved at a rapid pace, due to increasing demands on the service coupled with limited resources. The Association of Ambulance Chief Executives' (AACE) vision of the ambulance service for 2020 sets out the ambition to re-position the ambulance as a 'mobile healthcare unit', which will result in increasing demand to deliver treatment and care in the pre-hospital space.[3]

The success of this strategy will hinge on unifying these two 'enablers'. From this arise two key visions; the 'smart' ambulance, and the 'data-empowered' paramedic. Underpinned by innovative technology, these two concepts can work hand-in-hand to shape the future of the ambulance service. Whilst in the UK the smart ambulance is still a more long-term vision, the technology required to enable the data-empowered paramedic is already here.

THE 'SMART AMBULANCE'

In the last two decades, there have been various initiatives around the world focused on designing a model 'smart ambulance'. Driven by their sprawling geography and the long distances ambulances often have to cover to get patients to hospital, countries like the US and Australia are now ahead of the game in terms of ambulance design. Responding to the increased need for more self-sufficient, well-designed ambulances with better diagnostic and treatment capabilities, in 2016 two companies in Australia unveiled their joint prototype Smart Ambulance to Australian and New Zealand ambulance authorities. This promised a safer working environment for paramedics, more efficient fleet management and improved real-time communication of patient conditions with hospitals.[4]

In Europe, which tends to be more densely populated, until recently there has been less need to innovate in ambulance design. In the last decade however focus has shifted, with various initiatives gaining pace. In 2011, the Helen Hamlyn Centre for Design put out a report, in collaboration with the London Ambulance Service among others, outlining their design for a 'new and innovative ambulance interior'.[5] Following this, the Smart Ambulance: European Procurers Platform (SAEPP), funded by the European Union's Horizon 2020 research and innovation programme, was set-up in 2015. The project's aim was to standardise the ideal ambulance specifications across the EU and build a working prototype smart ambulance,[6] however it does not appear to have progressed past the consultation stage. More recently in the UK, there have been trials of mobile stroke units at several sites; ambulances which integrate an array of additional diagnostic technology to increase treatment rates ensure faster time-to-treatment, which is vital for stroke patients.[7]

Whilst the smart ambulance is an evolving concept, these initiatives all share a common goal: to improve the ability to treat patients on-scene and provide better connectivity with other hospital services. The 2020 vision of the ambulance service outlines the ambition for ambulances to become 'connected mobile treatment centres' that can stream live patient data.[3] Better connectivity between ambulance services and hospitals will help to further integrate the service with other NHS services, making the care continuum more efficient and leading to better patient outcomes. It is also one of the major strategic approaches for sustainability.[8]

EMPOWERING PARAMEDICS

The smart ambulance has not yet been widely adopted in the UK, and it may be some time before working prototypes are on the roads. This is why the vision of the data-empowered paramedic must be supported in parallel with the smart ambulance. Care begins outside the ambulance, with the paramedic or the first responder, so they need to be better supported by the technology they carry not just the ambulance itself.

As with the smart ambulance, there is now a pressing need to improve paramedics' telemedicine capabilities and better connect them to emergency departments. They already use portable remote-monitoring and defibrillation devices, but many current devices capture a snap-shot of data and do not have the ability to stream rich, event-driven patient information in real-time.

The real-time flow of patient data, including pictures and videos, directly from the device in their hand would enable paramedics to make better onward care and on-scene treatment decisions with support from the relevant contact in hospital. Automatically capturing the data instead of having to manually record it will also allow paramedics to focus on the task in hand. Additionally, it provides a more accurate record of events, which paramedics can review and learn from to build their confidence.

At present, some telemedicine technologies are not being used to their full potential. Many people hold a fairly one-dimensional view of the ambulance service,[3] and local care pathways may not give paramedics licence to spend time treating on-scene. As recognised by the AACE, truly empowering paramedics will mean equipping them with the skills and confidence to deliver high-quality urgent care,3 but this ambition must be supported on all sides. With new technologies on the horizon for later this year, this could all be set to change.

THE FUTURE OF CONNECTED CARE

The smart ambulance and the data-empowered paramedic will ensure seamless data flow across the care continuum, promoting better connectivity between ambulance services and other NHS departments. The smart ambulance cannot reach its full potential without the data-empowered paramedic, and with no smart ambulance in the UK ready for deployment yet, the latter should be our immediate focus.

A complete solution to empower paramedics will be launched later this year. RDT's Corsium enhances paramedics' existing toolkit of the Tempus ALS monitor and defibrillator, with an 'ecosystem' of data capture and real-time data streaming to any device.

Supporting and enhancing paramedics' decision making will streamline the patient experience and help reduce the number of unnecessary ambulance transports, making the healthcare service more efficient and reducing pressure on A&E. The data collected can also help to inform strategy and enrich training for ambulance staff and the healthcare system more broadly. The data collected can also be easily flowed into upstream patient record systems.

With Corsium at its heart, the visions of both the smart ambulance and the data-empowered paramedic will be integral to the future of a more connected and integrated emergency response.

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Putting Patients First

Building Adaptive Digital Health Programs

ERT, a global data and technology company dedicated to improving health outcomes through innovative drug development and patient support solutions, and Foundry[3], a creative, science and innovation consultancy, recently announced a partnership to create tailored digital health programs that improve clinical outcomes by providing support to patients throughout their healthcare journeys.

The partnership brings together the expertise of two organisations with distinct capabilities in driving digital health program success. Foundry[3] adds its unique approach to uncovering the challenges and motivators that impact patient behaviours and how they can be interpreted into a cogent digital health strategy to ERT's global expertise in delivering regulatory-compliant drug development and patient support solutions for the pharmaceutical industry.

We spoke to Tim Davis, Vice President, Digital Patient at ERT and Alex Butler, Co-founder of Foundry[3], to discover how, through this collaboration, they will deliver rich, adaptive digital health programs – based on substantiated patient needs – to help patients better manage their conditions and ultimately improve health outcomes.

How would you say digital health programs have changed over recent years?

Alex: "Most initial digital health programs were based on a number of assumptions that really didn't have any evidence, or validity, behind them. Often they were designed to support what the organisation, i.e., the pharmaceutical company or healthcare provider, believed would work, or, what they wanted to work because of how they wanted patients to behave. As we know from various aspects of our daily lives, people want to have control over how they engage with technology; they don't want to be told how and when to interact, and they expect real value as a result of their interactions. Therefore, we need to provide tools and services that take these factors into consideration in order to genuinely help patients improve their lives.

This applies whether a digital program is intended to improve quality of life, make a difference to the way that patients understand their illness, or to facilitate better conversations with their healthcare providers. For example, patients can use technology to record events that happen in between visits with healthcare professionals, such as stress levels, sleep tracking and even automatic 6-minute walking distance tests. There are so many different ways that digital health programs can deliver real patient value.

Today's technologies also enable us to incorporate validated tools to understand and track patient improvements. There are simple, validated, questionnaires that can help us understand what it's like to live with a condition and as a result provide better patient information and support, but traditionally these were rarely used in clinical practice. There are a whole host of patient reported outcomes (PRO) tools that could not only help patients and HCPs, but also help pharma to understand the impact of medicines and other interventions in the real world."

Tim: "From the tech side, what has changed is the technology to support these processes. Traditionally, digital health programs required patients to first enter the medications they were taking and how often they were taking them. For some this data entry could take 10-20 minutes before finally getting to something of value, so many patients would just walk away at that stage. Some organisations still want to capture this information, so it's very important for solutions to be flexible and give patients choices. We have learnt that when patients can choose which elements they want to engage with rather than being forced to respond to a cascade of questionnaires, they are a lot more open and willing to continue their interactions with the technology."

When you look to design a patient support program, what are the key starting points?

Alex: "The key starting point is the patient. Implementing patient-centric programs in the real-world requires organisations to truly and rigorously look at patients' lives and discover what they actually want. We have a simple model that looks to understand what the clinical intervention should be, which includes working out where the evidence base is for what people can do, or interventions that can be accomplished. We then look at what type of behaviour can be supported. This can get a little tricky, because although it may seem like we're trying to modify the way that people think, we're actually trying to enable interventions that can support behaviours that have been proven to enhance outcomes.

Historically, the use of behavioural science in pharma programs was about getting experts to talk about different theory models, whereas now we are focused on using behavioural theory to direct how to present information, give patients choices and enable them to take action.

The final consideration is what actual value the patient is going to get out of the interaction. If they're not focused on reminding themselves to take their medicine, but they have to plough through 15 minutes of a set-up process that purely focusses on that, then it is unlikely to add value to the patient. Patients' daily lives are already busy, so if a digital health program makes the chronic condition management more complex and time consuming than it was previously – and does not add any great value – it's not likely to be something that they will use."

Personalisation has become a major factor in delivering these types of programs. What tools and techniques work best for creating adaptive solutions that can be tailored to individual users?

Tim: "Often the organisations we work with are focused on continually refining a solution before launching it, whereas we are much keener on getting solutions out there relatively quickly to see how they work and learn from this experience. We find this to be the best approach to creating adaptive solutions. We release new digital solutions with some of the key functions and then look at the implementation of additional features going forward. But we always reflect back to understand what those core objectives are. That way, when we introduce enhancements we can ensure that they are based upon learnings from the initial launch."

Alex: "Pharmaceutical companies have always been comfortable with segmentation models; however, these can be problematic when it comes to patient support design. The models often become organisationally defined and based on binary risk evaluation models that then define the patient interventions. We should enable organisations to personalise programs down to the individual. We can then use technology to build programs around individual attitudes and beliefs, thereby meeting real goals and needs. This enables us to develop services that support people in the context of their own lives, rather than trying to segment them into specific groups that may not really represent their needs."

How do you see current tech trends (conversation interfaces, artificial intelligence, etc.) impacting the design and delivery of these types of interventions?

Tim: "I think that it is really easy to throw everything at these type of programs from a technology perspective so that you have various ways to interact, rather than asking 'what can we do that would make patients' lives better and give us a path forward to engage with them on a longer-term basis?'

On the flip side of this, some technologies can actually have a significant impact. For example, with artificial intelligence (AI), where we can mimic natural conversation, we get a useful level of personalisation that something like an app doesn't provide. Essentially, it's still like entering a question into Google, but it provides a much more natural interaction that some patients really like. At ERT we have done some work with voice interfaces, which research has shown to work quite well with elderly populations. When it is appropriate, we will incorporate these types of technologies, but at the core we will always ask 'what value will it add for the patient?'"

Alex: "The key factors are 'simplicity' and 'what you are trying to improve?' when it comes to clinical outcomes. If you start from a technology point of view, often you make the wrong decisions based upon whatever biases you have. Actually, the simplicity side of things is what excites me about technology. If you can just type a question into a solution, in natural language, and get genuine help and responses – also in natural language and in real-time – then that is a massive improvement for many patients trying to manage chronic diseases.

The challenge is for pharmaceutical companies to provide information that is genuinely easy to understand. A lot of content that is currently produced for people with health conditions doesn't work when put in the context of an actual conversation, which shows just how unreadable and unhelpful it is from a health literacy point of view. AI's capacity to help solve these problems is going to be really powerful for patient support programs. The irony is that a voice interface probably has the most benefit among patients who are not able to get support through other current technologies, e.g., those living with Alzheimer's, early onset of dementia and other such diseases. It is exciting, but I believe you should never lead with the actual technology."

How do you see this collaboration adding value to the solutions you develop?

Tim: "We want to create better, more relevant and highly sustainable patient support programs. We think that there are two aspects to achieve this. The first is helping pharma to work with patients so that we can make something tangible that will make a real difference in their lives. The second aspect is around the delivery. These days, digital health programs are so much more complex than just a standard app. They require greater in-depth experience in multi-country roll-outs, changing regulatory environments and data privacy considerations, as well as an overall understanding of how to manage these programs for the long-term and not just for an initial product launch.

Speaking for ERT, we recognise the experience and the strength that Alex and his team has when it comes to really getting to the crux of understanding the key performance indicators and relating those to every day patient experiences. This means that we can design patient support programs that have a positive impact on behavioural change and offer true value in their lives."

Alex: "Foundry[3] has a long history of helping pharma to innovate when it comes to improving clinical and patient outcomes. I think that if you combine insight, strategy and an understanding of how to apply technology to improve patients' lives and outcomes with the capacity to manage all of the complexities of data privacy – and you deliver that type of innovation at scale, which ERT has repeatedly done – then you have something that is really exciting." ■

INDUSTRY NEWS

News and Information for Digital Health Professionals

Future Health Index Outlines Journey to Value-based Healthcare

Philips has released the first chapter of the 2018 Future Health Index (FHI), a research-based platform designed to help determine the readiness of countries to address global health challenges and build efficient and effective health systems. The FHI focuses on the crucial role that technologies for connected care and digital tools can play in delivering more integrated and sustainable healthcare.

This year's FHI analyses the primary research and third party data from across 16 countries, representing about half of the world's population. The 2018 FHI introduces the Value Measure, a new indicator of the value delivered by healthcare systems of developed and developing markets. Combining criteria associated with value-based healthcare and access to care, the Value Measure provides a benchmark against which a system's progress towards efficient and effective healthcare can be evaluated. The report also includes the input from global healthcare experts and provides actionable insights for countries to improve the value that their health systems deliver.

A new value indicator

In line with the FHI's historical focus and findings, the Value Measure is based on three key criteria:

» Access i.e. how universal and affordable is access to healthcare?
» Satisfaction i.e. to what extent do the general population and practitioners in each market see their healthcare system as trustworthy and effective?
» Efficiency i.e. does the system produce outcomes at an optimum cost?

This methodology builds on the fast-growing consensus that the value-based healthcare model is the best approach to address the challenges posed by a combination of growing and aging populations with the rise of chronic diseases and healthcare costs.

"Global experts agree on the need to move away from a volume-based measure of healthcare to a value-based one," said Jan Kimpen, Chief Medical Officer for Philips. "Devising a meaningful Value Measure, including access to care next to patient experience and efficiency, is an important step in helping countries to measure their readiness to address healthcare challenges."

The role of technology

One of the most important findings from the 2018 FHI is that countries with a high Value Measure tend to exhibit high levels of connected care technology adoption. This indicates that integrating connected care technology into health systems can accelerate countries along the path to value-based healthcare. Health systems that provide universal access to care and deliver effective outcomes, as well as high levels of healthcare professional and general population satisfaction – such as those in Singapore, Sweden and the Netherlands – tend to be those with comparatively high levels of support from advanced data collection and analytics, and that have integrated connected technology into care delivery models.

However, examining the overall Value Measure results across the 16 countries studied indicates that while there is a correlation between a country's wealth, development levels and ability to deliver value-based healthcare, no one market is a consistent performer across all criteria. Varying pockets of excellence and system shortfalls mean different countries may approach this journey in any number of ways. However, while methods are important, connected care technology is foundational to value-based healthcare.

Therefore, the next two chapters of the 2018 FHI will take a closer look at two digital enablers, which have the potential to significantly drive change through connected care technologies:

» Data collection and analytics i.e. the ability to share and collect patient centric data and analyse it on a large scale
» Care delivery i.e. technology developments which are bringing innovative ways to deliver better care

For additional Future Health Index related content, please visit *https://www.futurehealthindex.com/*. ■

DreaMed Diabetes Granted FDA Authorisation to Offer Personalised Optimisation of Insulin Pump Therapy

DreaMed Diabetes, a developer of personalised diabetes management solutions, has been granted a De Novo request, by the FDA, for DreaMed Advisor Pro, an artificial intelligence (AI)-based diabetes treatment decision support software. Advisor Pro is indicated to assist healthcare providers in the management of people with type 1 diabetes who use insulin pumps and continuous glucose monitoring (CGM).

DreaMed Advisor Pro is a cloud-based digital solution generating insulin delivery recommendations by analyzing information from CGM, self-monitoring blood glucose (SMBG), and insulin pump data. Applying event-driven adaptive learning, Advisor Pro refines its understanding for each individual and sends recommendations to the healthcare provider on how to optimize a patient's insulin pump settings for basal rate, carbohydrate ratio (CR) and correction factor (CF).

"This is an innovation that can improve people's lives and the FDA decision confirms what we believe is an important step in making a more meaningful connection between the healthcare provider and their type 1 diabetes patients," said DreaMed CEO Eran Atlas. "Type 1 diabetes, managed with greater attention, leads to improved patient quality of life and reduced payer health-related costs. Advisor Pro enables patients using CGM and an insulin pump to analyze data and recommend to their provider when a change in diabetes-care treatment is timely and needed."

There are more than one million people in the United States with type 1 diabetes[1]. According to the T1D Exchange, the largest clinic registry of patients with type 1 diabetes in the U.S., about 50% of patients in the registry use insulin pumps[2]. This added digital health capability is a step toward making pump and CGM technology more valuable in diabetes management.

Two years ago, in anticipation of the FDA review, DreaMed and Glooko, the leader in diabetes data management, signed an agreement that enables Advisor Pro to be integrated into the Glooko diabetes data management platform.

"This is a significant achievement and practical example of how AI and digital health can improve patient care and enable care teams," said Russ Johannesson, CEO of Glooko. "We congratulate DreaMed and look forward to working closely with them to demonstrate that Advisor Pro can play a central role in optimizing insulin therapy."

"This marks a milestone for people living with type 1 diabetes (T1D). The FDA clearance reinforces why Helmsley supports the development of technologies like DreaMed Advisor Pro that show promise for improving lives in the T1D community," said David Panzirer, a Trustee of The Leona M. and Harry B. Helmsley Charitable Trust, which in 2016 awarded a $3.4M grant in support of Advisor Pro. "Managing T1D can be overwhelming both for people living with it, and for their clinicians. The DreaMed Advisor Pro harnesses the power of AI to optimize insulin regimens, and will undoubtedly lead to better outcomes for people living with T1D – a driving vision here at Helmsley."

This is the second regulatory approval for Advisor Pro this year, having received the EU CE Mark in February 2018. In addition, DreaMed received CE Mark for its artificial pancreas technology in 2015, Glucositter, which was licensed by global health technology leader Medtronic Diabetes. ■

Amazon is Building a Health and Wellness Team around Alexa

Amazon is reportedly building a team to incorporate its digital assistant Alexa, with healthcare in the US, says GlobalData, a leading data and analytics company.

Alexa already has widespread reach with up to 11% of US consumers using it in their home and in September 2017, the company announced that basic health information and advice provided by Mayo Clinic would be available on the device.

Mark Needham, Healthcare Analyst for GlobalData explains, "Users are now able to download the Mayo Clinic First Aid skill on their device, voice their concerns to the machine, which will then give answers to dozens of everyday health issues or other self-care instructions."

Additionally, according to Harvard Business Review, the KidsMD skill, which allows parents to ask for guidance on common illnesses, has logged more than 100,000 interactions with Amazon's voice assistant.

The Amazon team's main job is to make their voice assistant more useful in the US healthcare field, an effort that requires working through regulations and data privacy requirements laid out by the Health Insurance Portability and Accountability Act. With the right compliance and licenses in place, Amazon could let customers share their medical records with Alexa-powered devices, which could then allow them to communicate with a medical professional from home, and share their sensitive medical records with qualified third parties.

Diabetes management, care for mothers and infants, and tools for the ageing population will also be reviewed by the team.

Needham added, "Amazon also has numerous other projects underway that are focused on taking a slice of the multi-trillion-dollar US healthcare industry.

"Amazon Web Services, the cloud-computing division, has a team dedicated to serving health and pharmaceutical companies, and, on the e-commerce side, the marketplace group is reportedly looking at ways of getting into drug distribution." ■

Digital Therapy Company Healios Raises £2.2m in Latest Funding

Healios, the digital therapy company for mental health, has raised £2.2m ($3m) in its latest funding round, led by investors Albion Capital and Spice Capital.

Founded in 2013, Healios empowers young patients and families affected by mental illness and neurodevelopmental conditions through combining the use of technology with specialised clinician expertise and evidence-based clinical tools. Utilising its unique digital platform, Healios enables the efficient delivery of family-centric care, delivering a revolutionary interactive experience across multiple family members. Its technology-driven approach increases both access to and engagement with therapy and enhancing the quality of care and outcomes for its users.

Research from Mind found that 1 in 4 people in the UK now experience a mental health issue each year (mind.org.uk). Healios is helping to meet the huge growth in the demand for mental healthcare, particularly for young people, driven by both a rise in cases and the increasing recognition that mental health treatment should be on a par with its physical equivalent. The use of family-centric care is considered gold standard for treatment of mental health in the young, but is currently hampered by the difficulty in logistics and accessing sufficient specialist therapists.

"Technology and digital tools are resetting our expectations of every interaction that we have, including the way we think about mental healthcare. Healios brings transformative technology to the forefront of the treatment experience to deliver excellent ➪

mental healthcare that is accessible anywhere. Demand for our services continues to grow significantly as families require flexible and convenient assessment, treatment, and support. This funding will allow us to expand strategically to increase access, innovate rapidly, and execute on our vision to help families in need around the world." Said Richard Andrews, Founder and CEO, Healios.

Healios' clinical platform facilitates psychological assessments, treatments, wellbeing monitoring and clinical time with qualified clinicians through video conferencing and interactive digital tools. The data shows that 80% of young people choose Healios over face-to-face clinical sessions. The ability for the platform to fit seamlessly into a digitally-focused lifestyle and at the same time engage family members is a key differentiator from traditional therapy providers.

The company is currently working with many NHS trusts to reinvent the provision of mental health treatment so that it can be accessed quicker, and in both a flexible and inclusive way. The service is currently integrated into the NHS network, operating on a seven day basis to give patients an unprecedented treatment experience.

Dr Andrew Elder, Partner and Head of Healthcare, Albion Capital, says: "Healios is a hugely exciting prospect, and offers a model that we believe can change the face of mental healthcare for millions of patients. Mental health cases in the NHS are rising dramatically and Healios not only provides a solution to meeting the demand, but also enhancing the service from both a personal and medical perspective. We look forward to working with the team to bring this extraordinary platform to many more families across the UK and beyond."

The investment will be used to scale up the operations of the

company, enable more widespread accessibility for NHS trusts and private organisations to use its online treatment platform, and further product development.

Maryline Kulawik, Managing Partner, Spice Capital, said: "We were completely convinced by the patient-centric telemedicine platform brought to the market by the Healios team. They have combined a unique state-of-art digital technology with a very deep knowledge of mental health issues to provide a flexible, effective and family-focused solution. They will help the community face the growing challenge of mental wellbeing and dramatically reduce delay in access to care. The platform will offer patients customised consultations from the comfort of their home and an acute data-driven monitoring of their condition. We are very excited to support the Healios team in this disruptive project with societal impact." ■

Hackensack Meridian Health Funds Innovative Medical Home Hub

Hackensack Meridian Health, New Jersey's most comprehensive and integrated health care network, has invested in medical home hub Pillo, an intelligent health care companion which empowers patients to better manage their health at home while connecting them to caregivers and family members. This is the first product funded through the network's $25 million innovation program to support the improvement of health care delivery.

"We are excited to invest in Pillo Health and to support the development of the Pillo in-home care companion technology," said Robert C. Garrett, co-CEO of Hackensack Meridian Health. "We see this as a landmark moment for Hackensack Meridian and for our commitment to leveraging innovation to improve the lives of our patients and countless others."

Boston-based Pillo Health, a leading in-home digital care management company, created Pillo to serve as a medical hub in the home. Pillo leverages voice-first technology and artificial intelligence to connect patients at home with their care teams and family members.

"Innovation is in our DNA at Hackensack Meridian Health," said Andrew Pecora, M.D., president of physician enterprise and chief innovation officer. "This first project funded less than a year after launching our ideation center is a major achievement to improve health care."

Sitting on a table or countertop, the voice- and video-enabled Pillo device reminds people to take medication at the appropriate time, dispenses their medications, digitally coordinates prescription refills and connects individuals in their homes with physicians, caregivers and loved ones. For example, Pillo can alert a family member if an elderly relative misses a medication dose. Pillo can also connect a patient or family member with a physician via videoconference and provide an on-screen display of essential medical data as obtained from the patient's electronic medical record.

"The Pillo Health team has tremendous respect for Hackensack Meridian Health and for its commitment to innovation," said James Wyman, Pillo Health co-founder and COO. "We're excited to engage with experts at Hackensack Meridian Health to revolutionise the way health care is coordinated, managed and delivered in patients' homes."

Hackensack Meridian Health joined with the New Jersey Innovation Institute, an affiliate of the New Jersey Institute of Technology, bringing together engineers, scientists, health care experts and others to launch innovations to improve health care delivery. Hackensack Meridian created an Innovation Center where aspiring companies present their concepts to the center's ideation group. Those deemed ready are presented to the "Bear's Den" group of Hackensack Meridian's Innovation Center to decide on investment.

The health network's novel incubator has vetted many products and strategies to streamline care delivery, reduce infections, lower hospital readmissions and help patients partner in their care with physicians.

The best ideas have reached the Bear's Den, a panel of experts headed by Dr. Pecora and including venture capitalists, a patent attorney, medical and financial experts, and Hackensack Meridian Health Co-CEOs Robert C. Garrett and John K. Lloyd. Through investments from the $25 million fund, the network will help bring exceptional innovations to market.

Together, the Pillo Health team and experts from Hackensack Meridian Health will now look to identify novel use cases for the technology within the hospital system and develop a pilot and commercialisation road map to bring Pillo to market.

One of Pillo Health's primary goals is to support improvements in medication compliance. Prescription noncompliance adds a huge financial burden to the U.S. healthcare system, costing billions of dollars per year, according to the federal Centers for Disease Control and Prevention. Hospital admission rates increase for non-adherent patients with chronic illness by up to 69 per cent, according to the CDC.

Increasingly, healthcare organisations are turning to technology to help achieve the "Triple Aim": to improve patient outcomes, enhance the patient experience and reduce costs. While U.S. healthcare spending has grown from five per cent of GDP in 1960 to 17 per cent in 2016, life expectancy in the U.S. has decreased in the last two years for the first time since the great flu epidemic from 1916 to 1918.

Hackensack Meridian Health is a leader in improving the quality of health care while lowering costs. For example, a Medicare ACO is ranked 3rd in the nation with an exceptional quality score of 92 and savings of $50 million in 2016. Through advances in technology and enhanced care coordination, the ACO decreased emergency visits by 33 per cent, hospital readmissions by 47 per cent and days in skilled nursing facilities by 39 per cent two years ago. ■

World's Largest Screening Programme for Atrial Fibrillation

Zenicor Medical Systems has been selected as sole supplier for a screening programme in the UK for atrial fibrillation. The screening programme is the world's largest randomised controlled trial to discover whether screening systematically for atrial fibrillation, a heart condition responsible for one in ten strokes, and offering optimal treatment reduces the incidence of stroke, premature death and other health risks associated with atrial fibrillation.

Atrial fibrillation is the most common disturbance of the heart rhythm, characterised by an irregular pulse. It affects up to 10 in 100 people over the age of 65, a considerable proportion of whom do not know they have the condition. Atrial fibrillation may not be associated with any symptoms, but is linked to increased risk of stroke, heart attack, dementia and premature death. About 10% of strokes happen in people unaware that they have atrial fibrillation. However, therapy with medication (anticoagulation) is highly effective at reducing the risk.

At present, some GPs look for atrial fibrillation opportunistically by using a diagnostic device such as a hand-held electrocardiogram (ECG) or simply take the pulse of patients who could be visiting for any reason. However, this is not done in a systematic way, and only in some general practices.

The research, led by the University of Cambridge, will involve 120,000 patients, aged over 65, in 300 general practices across England. Patients in 100 practices will undergo screening, and those in 200 practices will not. People who are found to have atrial fibrillation by the screening programme will be offered treatment with anticoagulant drugs to reduce their risk of stroke and heart attack. Both sets of patients will be followed up for five years to see whether screening and treatment ➪

leads to fewer strokes, heart attacks and deaths.

The programme of research will include a cost effectiveness analysis to assess whether screening is a good use of NHS resources. Researchers will also observe what goes on in general practices when screening is carried out and interview staff and patients to explore issues around consent to screening and patient concerns.

Lead investigator Professor Jonathan Mant, Professor of Primary Care Research and Head of the Primary Care Unit at the University of Cambridge, said: "We know that a significant proportion of strokes occur in people with undiagnosed atrial fibrillation. Anticoagulation therapy is a very effective treatment that can reduce the risk of stroke by about 65%, so many of these strokes are preventable."

One problem with the current approach is that some people do not have atrial fibrillation all the time but go into and out of an irregular heart rhythm. In this new research, patients will be loaned a handheld ECG device, provided by Zenicor, to measure a (single lead) ECG twice a day at home for two weeks.

"This novel technique, the first time home screening has been used on this scale in the NHS, will detect intermittent atrial fibrillation that otherwise would be missed in a one-off test at a GP appointment," said Prof Mant.

Professor Richard Hobbs, Professor of Primary Care Health Sciences at the University of Oxford and Director of the NIHR School for Primary Care Research, said:

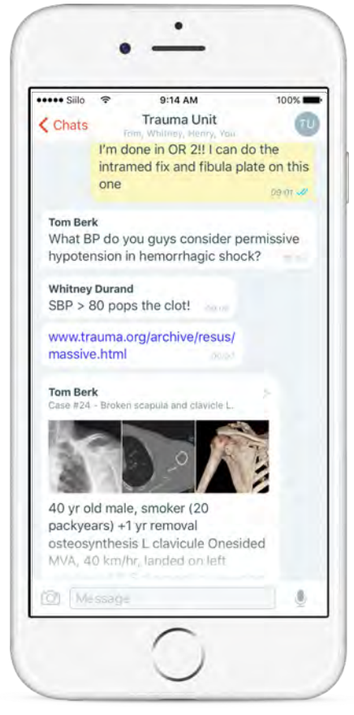
"There's currently not any evidence on whether systematic screening for atrial fibrillation works, so the National Screening Committee is not able to recommend it. Whether or not this research shows that screening is effective and cost effective, it will be a landmark trial that will affect UK screening guidance, and guidance elsewhere around the world." ■

Europe's Largest and Fastest Growing Healthcare Messenger Surpasses 70,000 Members

Secure mobile messaging platform Siilo has surpassed 70,000 members and completed NHS Digital's Information Governance Toolkit assessment, achieving Level 3 status as an 'NHS Business Partner'.

Siilo is a free, secure and GDPR compliant messaging platform for healthcare that connects physicians and other healthcare professionals on one platform to find, collaborate and share medical knowledge, delivering faster, better and more cost-effective care. Medical teams can directly download Siilo on their phones and be GDPR compliant for mobile forms of communication.

The IG Toolkit is the Department of Health's Policy delivery vehicle. It draws together the regulations set out by the DoH and presents them in a single standard set of information governance requirements. The ultimate aim is to demonstrate that an organisation can be trusted to maintain the confidentiality and security of personal information.



In comparison with the more common Commercial Third Party organisation type, an NHS Business Partner organisation is assumed to work more closely with the NHS and shares common goals for providing high standards of healthcare directly to patients, which requires extended information governance requirements. Level 3 is the highest standard in the NHS IG Toolkit assessment and the latest endorsement demonstrates the level of information governance Siilo applies to its secure messaging platform, alongside its current ISO 27001 certification.

Joost Bruggeman, former physician and CEO of Siilo said: "While consumer messaging app WhatsApp is considered the gold standard for mobile communication, there are significant concerns about its suitability for the NHS, despite its end-to-end encryption status. Siilo not only removes the risks associated with consumer apps but it also enables GPs, consultants and nurses to handle a crisis more effectively. Our latest achievement and record number of users is further testament to Siilo's growth and development and our dedication to ensuring patient safety is top priority."

Darren Lui, spinal and orthopaedic surgeon at St George's Hospital, London has been using Siilo to communicate with his 50-strong team of consultants, junior

staff, specialist physician assistants and specialist nursing staff.

He said: "As a Level 1 trauma centre, we treat a large volume of patients which means communication is essential to ensure the department runs smoothly. Siilo has a direct benefit on how we treat patients in orthopaedics traumas and has transformed the way my team communicates.

"Given the security measures Siilo offers we're confident using real patient identifiers; name, gender and date of birth. These are necessary social cues that help doctors recognise patients far more effectively than using complicated anonymised patient IDs. I would certainly expect to see it extended into other departments and hospitals across the UK." ■

Follow-up Algorithm for Cancer Patients Treated with Immunotherapy enters a Multi-centre Clinical Trial

A novel follow-up algorithm for cancer immunotherapy, developed by digital health company Kaiku Health, is undergoing clinical validation in a multi-centre trial conducted at Oulu University Hospital, Turku University Hospital and Docrates Cancer Centre in Finland.

Patients treated with immune checkpoint inhibitors PD-1, PD-L1 and CTLA-4 antibodies are provided with the Kaiku Health web application to report on their symptoms and quality of life in real-time. Algorithms screen the patients' symptom data and alert the care team according to the severity of symptoms. The study aims to unveil the impact of digital monitoring in managing immune-related adverse events, as well as patient compliance to the new follow-up method. The research centres are currently recruiting patients for the trial and first results are expected during 2018.

We still have limited knowledge of the adverse effects when treating patients with immune checkpoint inhibitors. The effectiveness of these treatments is based on their ability to activate the body's own T lymphocytes. These T cells can also attack healthy tissues, which is why some adverse effects resemble autoimmune diseases. This sets new requirements for patient follow- up," explains Jussi Koivunen, MD and principal investigator from Oulu University Hospital.

"We have already seen promising results in electronic symptom reporting in conventional cancer treatment follow-up. We are now looking into how electronic symptom monitoring might aid in symptom management of immune-related adverse events. Simultaneously, the study will accumulate data for further analysis and development of given new treatments." ■

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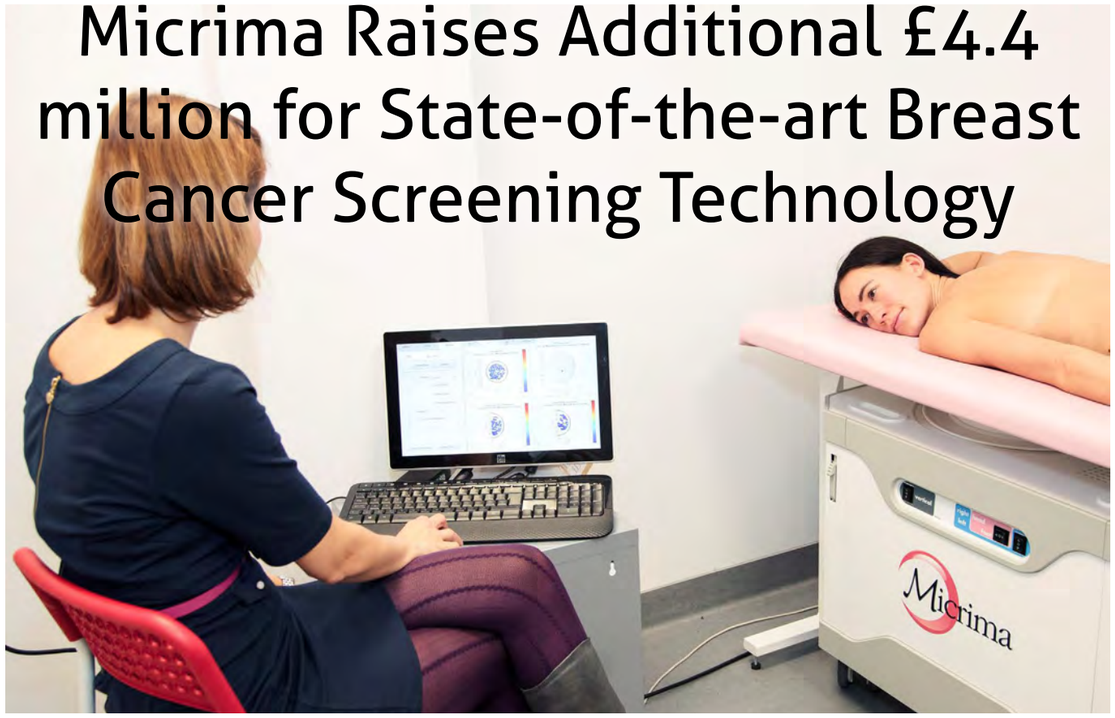
Digital Health Global 100

Micrima Raises Additional £4.4 million for State-of-the-art Breast Cancer Screening Technology



UK-based breast imaging company, Micrima has raised £4.4 million in additional equity funding led by Technology Venture Partners, The Angel CoFund(ACF), and Venture Founders – plus a group of returning and new individual investors - bringing the total amount raised to £10.7m.

Micrima's patented MARIA breast cancer screening system is currently for use in symptomatic clinics, and it is intended that it will eventually be widely adopted as a viable alternative to mammography breast screening. It is unique in that it uses harmless radio-waves to detect breast cancer - unlike mammography that uses ionising radiation - requires no breast compression, so is painless for women, but is also a whole-breast method of imaging compared to some modalities that use a handheld probe. In clinical trials it has proven to be particularly effective in dense tissue, where the current screening technology struggles. It has been trialled in over 400 women in the United Kingdom, with further trials just about to commence at leading European centres.

Roy Johnson, Micrima's Executive Chairman, said, "I am very happy to announce the completion of our latest funding round, which provides us with the capital we need to move our initial MARIA product into full commercial launch and follow this swiftly with the enhanced functionality that the system is capable of achieving. The market has been prepared over the past 18 months through the publication of our historical clinical trial data, and attendance at numerous congresses and trade shows to showcase our breakthrough technology. As a result, we have many influential clinicians and partners anticipating the launch of MARIA later this year. We look forward to putting the product we have worked so hard to create into their hands for the first time."

This latest round will be used to further develop Micrima's ground-breaking and CE Marked radiowave breast imaging system, MARIA, aiming to play its part in enabling breast screening to be safer, more comfortable and more accessible to a larger proportion of the global female population, and to move the MARIA system into full commercial launch later in 2018. In addition, investment will go into expanding the team with strategic hires to help the company meet both of these, and its longer term, objectives.

Nick Simmonds, Partner of Technology Venture Partners, said "The success of this fund raising comes at a pivotal point in the development of Micrima as the company seeks to commercialise the MARIA Breast Imaging System and build out clinician advocacy at Key Opinion Leading Clinics in the UK and Europe. We are proud to show our on-going support for the company and the team as they further develop this important technology and we look forward to future success".

Tim Mills, Investment Director at ACF, said "We're delighted to be part of this latest round and to provide further backing behind the Micrima team, who continue to take forward this life changing technology through from the lab to a commercially viable product. Micrima has had great success in clinical trials and the team's work in bringing this important technology to fruition has been extremely impressive. The Angel CoFund is proud to offer its continued support as the company reaches this exciting landmark in its history."

James Codling, Co-Founder and MD of VentureFounders commented, "We were struck by Micrima's experienced and industry-leading team, as well as the demonstrable success of the MARIA imaging technology, and the possibility for it to have a major impact in healthcare. Micrima is anticipating a large and growing market around the world – this raise will allow it to work towards commercialisation and potentially make breast cancer screening accessible to a wider group of women." ■

Upcoming events

July 2018

10–11 Digital Health and Care Congress 2018

London, UK
For more information visit
www.kingsfund.org.uk/events/digital-health-and-care-congress-2018

August 2018

28–30 Connected Health Summit

Sand Diego, CA, USA
For more information visit
www.connectedhealthsummit.com

September 2018

13–14 Chief Nursing Officer Summit

Las Vegas, NV, USA
For more information visit:
http://www.opalgroup.net/trk/cnosc1803.html

20–21 Annual Artificial Intelligence in Drug Development Congress 2018

London, UK
For more information visit:
https://www.oxfordglobal.co.uk/artificialintelligence-congress/

20–21 16th Annual Pharmaceutical IT Congress 2018

London, UK
For more information visit:
www.oxfordglobal.co.uk/pharmatechnology-summit

20–21 Digital Health & Digital Technology Congress 2018

London, UK
For more information visit:
www.oxfordglobal.co.uk/digitalhealth-congress

25–26 UK Health Show

London, UK
For more information visit:
www.ukhealthshow.com

November 2018

14–15 Diabetes Professional Care

London, UK
For more information visit
www.diabetesprofessionalcare.com

15–16 Frontiers Health

Berlin, Germany
For more information visit
www.frontiershealth.co