WHAT'S INSIDE | NEWS, REVIEWS, CLINICAL DATA, mHEALTH APPLICATIONS

The Journal of mHealth

The Global Voice of mHealth

June/July 2016 | Volume 3 Issue 3

Access vs Privacy

Getting the right balance for data-driven healthcare

NEWS

Full Round-up of the Latest Industry News

INTERVIEW

NHS Adopts Population Health Solutions

REVIEW

A New Breed of Tablet Designed for Healthcare

Welcome

As the role of data in healthcare grows across just about every aspect of delivery and patient care the need to balance access to that data whilst also maintaining adequate control of privacy continues to be a major issue.

Providing patients with access to their data empowers them and allows them to take ownership of their care, which in turn can result in reduced cost and improve the patient experience. Allowing health care professionals access to critical clinical and operational data at the point-of-care improves the delivery of care and drives efficiencies across the system. As new technologies are incorporated into healthcare provision this 'balancing act' between the need to provide access for multiple stakeholders across many different systems, whilst maintaining the strict integrity of that data, has become a constant 'tug-of-war'. In this issue we include a number of expert articles that consider the different perspectives of health data access vs. privacy, and the implications of trying to maintain this balance.

Also, in a recent statement the head of NHS England, Simon Stevens, announced the launch of a new programme to fast-track cutting-edge innovations from across the globe to the UK NHS frontline. In a keynote speech, to around 1,000 NHS leaders, he announced that for the first time the UK NHS will provide an explicit national reimbursement route for new MedTech innovations. This coupled with the UK's existing target of delivering a paperless NHS by 2020, is sending a clear message to the digital health industry that the NHS is open for business.

The reality though is that in many NHS provider organisations there isn't even organisation-wide access to basic digital-enablers like WiFi. Therefore, the task ahead for many parts of the organisation to deliver on the promise of new digital technologies is significant. In this issue we present a range of articles, interviews and case studies that profile a selection of the many digital projects and initiatives that are happening across the UK NHS, with a view to understanding the current attitudes towards digital adoption.

If you are a digital health company or service provider interested in accessing the huge potential of the UK NHS then you will want to pre-order a copy of our report titled "Selling Digital Health Technologies to the UK NHS" which provides an in-depth analysis of the NHS market for digital products. Scheduled to publish this summer, this detailed report presents - Market access routes for digital health technologies; Unravels the intricacies of NHS service commissioning; Provides expert advice and insider knowledge; and, Details the myriad of essential contacts, support networks and organisations that are available to facilitate the technology deployment process. For more details and to pre-order your copy contact enquiries@simedics.org.

Matthew Driver
Editor

Published by Simedics Limited
www.simedics.org

Editor: Matthew Driver
Design: Jennifer Edwards

For editorial, research and paper submissions, and advertising opportunities please contact:
Matthew Driver
matthew@simedics.org
+44 (0) 1756 709605

Subscribe at
www.thejournalofmhealth.com

The editor welcomes contributions for The Journal of mHealth. Submissions can be sent to the editor by email, images and graphics should be submitted in high resolution format.

ISSN 2055-270X

In This Issue

Industry News

Access vs. Privacy

Managing Health Records in Today's Emerging Data Landscape

By Paul Trulove, vice president of product management for SailPoint

As the street value of personal identifiable information continues to soar, criminals are increasingly focusing their efforts on stealing this type of data. This is proving to be a big challenge for the healthcare sector, which is responsible for storing millions of sensitive data sets securely and for keeping it from getting into the wrong hands.

The business of healthcare has drastically changed in a short amount of time. The rise of connected healthcare has brought about new advances in technology with the likes of wireless devices, sensors and wearables. At the same time, the digitisation of medical records leads to even more patient data being stored, transmitted, and accessed electronically. While these technologies provide beneficial opportunities for practical patient care, they also reignite security fears.

The amount of data that connected technologies produce is rapidly growing. What's more, the data is being spread increasingly far and wide, often outside the perimeter of the organisation's firewall. For example, the usage of mobile devices in particular, means workers are increasingly performing their jobs away from company premises and using devices of their choice.

As such, cyber security is rising through the ranks to become one of the biggest priorities for the healthcare industry, with more pressure than ever before to minimise the damage associated with a data breach.

Working within the law

The battle for privacy over access took an important step forward with the approved General Data Protection Regulation (GDPR) being adopted by the European Parliament in April. One of the key points of this new legislation concerns the handling, storage and management of health data.

The GDPR puts the responsibility of such data at the top of the agenda, particularly for healthcare organisations, where the misuse or misplacement of this data can have severe effects on a person's private life.

GDPR, which is now official legislation with an implementation date only two years away in 2018, imposes a higher degree of protection for the processing of health data. This higher standard, aimed at protecting the rights and privacy of patients, could become a significant burden for health sector professionals who will have to navigate their way through these rules in order to comply with regulations.

With the growing scrutiny around protecting access to private and personal health information, it is essential that health services ensure they have the correct IT systems in place. Not only must they ensure the security of access to particular data, but they need to help mitigate the risk of files failing into the wrong hands too.

Shifting the security approach

It is clear that in recent times, organisations have made a conscious shift from relying on the prevention of breaches at the perimeter of the network, to ensuring they have damage control and resiliency when a data breach does occur. The ability to detect when a breach has occurred is an important part of protecting sensitive healthcare data since there is no longer a question of "if" a data breach will happen, but "when." Because of this shift, organisations need to know how to mitigate risk and respond quickly to contain the damage created. This new approach is reshaping how health services approach IT security, and only organisations that are proactive in building internal safeguards to minimise the impact of a breach are in a better position to defend against the cost and damage.

Balancing access and privacy

In today's digital world, health service users need access to a myriad of critical systems, applications, and data in order to do their jobs. This makes it difficult for organisations to ensure that each individual has the right access. This is complicated further when you consider how the IT landscape now encompasses a hybrid approach of both on-premise and cloud-based applications, as well as mobile environments. This hybrid IT environment calls for an increasing need for visibility and control across an organisation's users and their activity.

In order to reduce the risk of data breaches, health services must take a user-centric approach to security. Leveraging strong, governance-based controls for managing access to sensitive information ensures they have a single, unified view into and automated control over all user access. By putting identity and access management (IAM) at the centre of the security strategy, organisations will be able to minimise their risk of insider threats, sabotage, fraud or a subsequent data breach.

For IT healthcare departments looking for justification, especially where budgets are tight, having a strong IAM business case will highlight the benefits, including lower costs for IT resources and streamlined processes to improve profitability and efficiency, while protecting patient information. It will also provide a tool that continually measures the return on your investment, which will help justify future spending in the sector.

While prevention is still crucial, there are definitive steps that can be taken to increase resiliency and potentially reduce the negative impact of a breach when it does occur. Organisations that don't shift to a user-centric view of security could be leaving not only their patients and customers exposed to incredible risk, but their business too, inadvertently providing fuel to the fire and joining the growing list of data breach headline-hitters. ■

Access vs. Privacy: Managing Health Records

Balancing the Health Data Equation

By Keith Nurcombe

So here is a really interesting question - where should the line be, between helping your patient manage their health and conditions, and the patient's right to privacy and control of their medical records and information?

This is one of the really big questions that is now visiting desks and meeting rooms across digital healthcare - how do we use the technologies we want to and deploy and access the systems we need to without making the patient feel that their privacy is being invaded?

For me, firstly we put sensible measures in place which protect the data and the patient, to ensure that the information is secure and well managed which gives everybody - the payer, the patient and the clinician - comfort that all is well. Then secondly, we engage the patient in sensible dialogue about what they want. This should be done in a managed way, based on the need to give the patient the best outcome rather than putting them in total control of the process and scaring them into sharing nothing.

I believe that we can do two things that really help this process:

1. We can create patient owned healthcare plans, to which they upload information from whatever source they want, whether it is there Fitbit or their iPhone or just plain old how they are feeling. They then decide who to share this information with e.g. family friends and their clinicians. This allows them to feel in control and their clinician to get a level of engagement beyond the consulting room which they currently, in the main, don't have.

2. We then look at sensible ways of engaging patients with their, clinician-held, patient record so that they understand what it does; they understand what happens to it; and, why it is being held by the clinician. The cradle to grave concept of one record looks good on paper but generally patients don't have an issue with it when they understand why things are the way that they are.

Controversially, what we are then able to do is join these two together!

Imagine a world where patient-generated information gets to the clinician in a controlled way, which gives them the ability to make different more educated decisions on the care plan. This world be a world where the clinician then gives the patient challenges, targets and interacts with them in a way which helps them manage their wellness and their health in a completely new and supported way.

Goodness me, could you have created the utopia of a self-supported patient who actually interacts with the clinician because they can, rather than because they need to, and the clinician gets a well-educated and well-supported patient back.

There are already numerous examples of where this is happening now - Primary care providers in the UK are doing this today and it is changing the face of patient care for patients with long-term conditions and other complex co-morbidities.

This is the way forward in the long run a balanced system which works across both patients and clinicians, smoothly, and leads to patients who are supported and clinicians whose workload is more manageable.

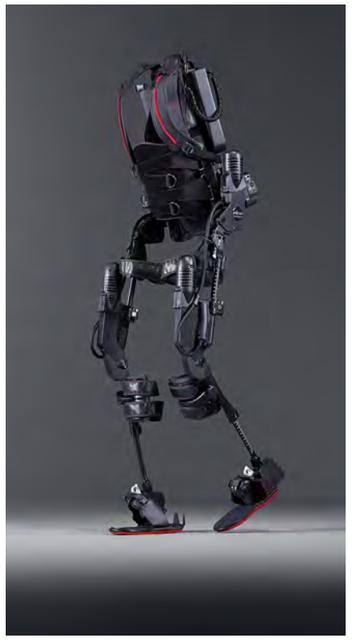
Surely not ..... Utopia really out there and being delivered!!!!

Keith Nurcombe has worked in healthcare for over twenty years spending the last few years working with businesses in the health and technology space, most recently building O2 Health where he was Managing Director until the end of 2012, since then he has been providing consultancy services to businesses. ■

INDUSTRY NEWS

News and Information for Digital Health Professionals

Robotic Exoskeletons Gain Global Connectivity with IoT Technology



Vodafone will be connecting the world's first and only exoskeleton that is FDA cleared for use with both stroke patients and spinal cord injuries – the Ekso GT™ from Ekso Bionics®. Vodafone's network and global Internet of Things (IoT) SIM will ensure reliable communications for diagnostics and improved access to patient data, helping to improve the user experience with the suit.

Robotic exoskeletons are ready to wear, battery-powered robots that are strapped over the users' clothing, enabling individuals to achieve mobility, strength, or endurance not otherwise possible.

The Ekso GT can provide adaptive amounts of power to either side of the patient's body, helping to improve results for patients. The suit allows physical therapists to mobilise patients earlier, more frequently and with a greater number of high intensity steps, all of which will aid recovery.

Vodafone Group's Head of IoT for the Americas Andrew Morawski said, "The Internet of Things is enabling all types of medical devices to be connected anywhere in the world, which is directly affecting the care that patients are receiving. The focus that Ekso Bionics has on helping stroke and spinal cord injury patients to increase mobility is making a significant impact on the quality of life for its users."

"We are in business to help people achieve the remarkable, and we can do this most effectively with best in class partners. We chose Vodafone to provide a single global solution that ensures seamless connectivity, no matter where a rehabilitation hospital is located," said Thomas Looby, Ekso Bionics' chief executive officer. "With Vodafone IoT technology, we can monitor how our exoskeletons are performing in real time, providing therapists with data on how the patients' rehabilitation is progressing."

Ekso Bionics has been able to simplify its manufacturing process by using the same Vodafone SIM for all suits globally as well as having a single worldwide partner delivering a managed service. Ekso Bionics' Ekso GT is currently available in the United States, Mexico, Canada, South Africa, and in most European countries. The Ekso GT is offered in more than 150 leading rehabilitation institutions around the world and has helped enable its users to take more than 50 million steps not otherwise possible. ■

Drones to Deliver Blood Supplies in Rwanda

Drones and healthcare may sound like an unusual partnership, but in an effort to improve the access to vital medications, vaccines and blood supplies a new project in Rwanda will 'take-to-the-skies' in a bid to use drones to deliver essential medical supplies, to remote regions of the country.

In a joint partnership, between Rwanda's Ministry of Health, Gavi (the Vaccine Alliance) and Zipline, an autonomous robotics company based in San Francisco, a new national drone delivery network is due to launch this summer, delivering blood supplies to remote and hard-to-access regions across Rwanda.

The project will also test the suitability of drones for the delivery of a wider range of medical products and vaccines.

The project which has been backed by global delivery and logistics giant UPS through its 'global citizenship' arm, the UPS Foundation, will initially involve Zipline establishing a small launching hub for a fleet of 15 autonomous drones.

When a patient needs a blood transfusion, antibiotics, or vaccines a doctor, nurse, or health centre technician will send Zipline a text message and a drone will airdrop the needed supplies within 30 minutes. The drone will send a message to the health centre when it is two minutes away and the package, equipped with a parachute, will fall slowly to the ground. The aircraft would then return to the launch hub.

"Our mission is to deliver critical medical products to hospitals and health centres that are basically unreachable with standard modes of transportation," Zipline co-founder and CEO Keller Rinaudo said when announcing the project. "Patients frequently die because of lack of access to a basic medical product that exists in a central warehouse 75 kilometres away but can't make it out that final mile to the person who needs it."

Dr Seth Berkley, CEO of Gavi, said: "It is a totally different way of delivering vaccines to remote communities and we are extremely interested to learn if UAVs [unmanned aerial vehicles] can provide a safe, effective way to make vaccines available for some of the hardest-to-reach children."

The drones that will be used in the project can reach a speed of 140 km/hour and fly in inclement weather and heavy winds. Using military-grade GPS the unmanned-aircraft are able to fly autonomously, based on a pre-determined route before air-dropping their payload at the required location. They are capable of carrying up to 3 1/2 pounds, allowing them to transport two standard packets of blood.

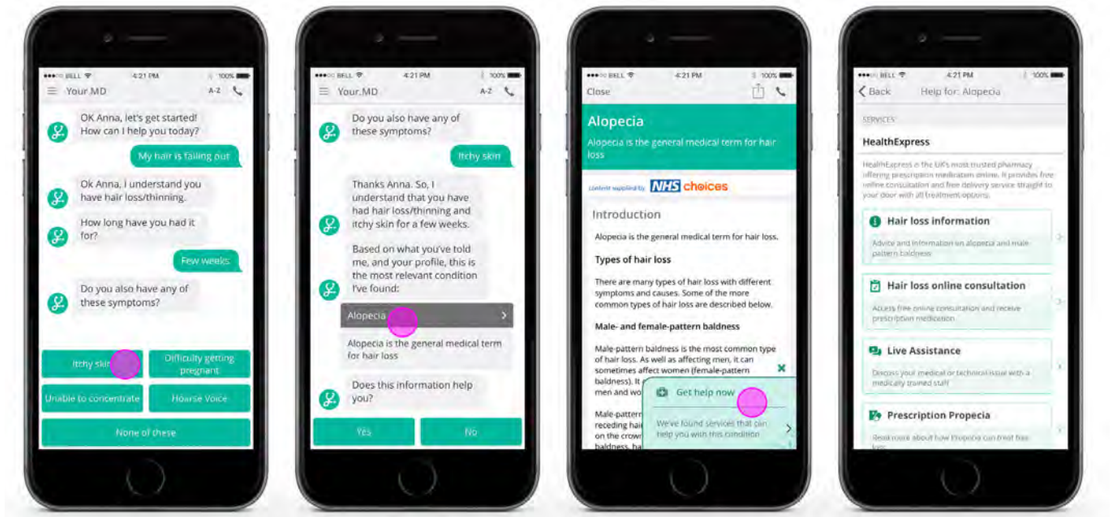
Zipline is launching its service in Africa, Rinaudo says, because the area's medical supply delivery system is broken. The relative lack of infrastructure on the continent makes emergency medical deliveries especially difficult. The last mile of delivery is usually done by motorbike, which can be expensive and unreliable.

Staffed by former aerospace employees from NASA, SpaceX, and Boeing, Zipline has partnered with both the National Centre of Blood Transfusion, in Rwanda, as well as signing a deal with Rwanda's Ministry of Health to provide medical delivery services. These partnerships will see Zipline delivering all blood products for twenty hospitals and health centres starting this summer, improving access to healthcare for millions of Rwandans.

Eduardo Martinez, president of The UPS Foundation and chief diversity and inclusion officer at UPS, said: "Public-private partnerships are the key to solving many of the world's challenges, with each partner contributing its unique expertise. UPS is always exploring innovative ways to enhance humanitarian logistics to help save lives, and we're proud to partner with Gavi and Zipline as we explore ways to extend the Rwandan government's innovations at a global scale."

Zipline hopes that the Rwanda project will pave the way for wider deployment of the company's drones to other countries around the world. ■

AI Recommendation Solution to Find Public and Private Health Services and Products



Your.MD, the Artificial Intelligence (AI)-powered Personal Health Assistant that offers personalised, trustworthy and free health advice to everyone with a mobile phone, has revealed the launch of OneStop Health - a new service that enables users to find relevant and trustworthy public and private health services and products to help them get better faster.

With OneStop Health, Your.MD is the first one-stop-shop in digital health to allow people to take full control of each stage of their health issues: from understanding their symptoms to finding the best treatment - all via a chatbot.

The launch takes place as Your.MD adds Facebook Messenger - 900 million monthly active users, predominantly in the West - and WeChat - 700 million monthly active users, predominantly in the East - to the list of distribution platforms on which its AI Personal Health Assistant is now available.

Your.MD's OneStop Health empowers mobile users to find the safest and most suitable health service providers and products. OneStop Health is the final element of Your.MD's 3-step service that enables people to get answers to the 3 fundamental health questions:

1. What's wrong with me?
AI understands what the user is suffering from

2. What's the most likely solution?
AI will find the most relevant condition and offer a solution

3. What services are available to help me get better?
If needed, AI will propose the best free and premium 3rd party services from OneStop Health

Focusing initially on five key areas - prescription medicines, mental health, telemedicine, specialist services from the NHS, and integration with other self-care apps - Your.MD's OneStop Health fills a gap in the market for a one-stop-shop where people can go to find best-in-class health service providers and products, at anytime, anywhere in the world, that are relevant to their unique circumstances.

Matteo Berlucchi, Your.MD's chief executive, said: "Your.MD is truly revolutionary and can make a seismic impact on the global healthcare system by providing accessible, trustworthy and instant healthcare to everyone with a mobile phone. Our OneStop Health is an integral part of our vision; if you can't get to your doctor or need to get a blood test, a prescription or make an appointment to see the best local specialist, Your.MD can facilitate it - safely and responsibly by connecting you to the best service providers and products who can help you get what you need."

Your.MD's OneStop Health launches with several services already integrated. HealthExpress will provide Your.MD customers with an online clinic that, following a free remote consultation with a doctor, can dispense online prescriptions. The free, next-day delivery service - or same day delivery for London postcodes - will initially be available in the UK, with plans to roll-out across Europe. Reputable online psychotherapy platform, PlusGuidance will provide a 24-hour on-demand service for patients with mental health issues via video call, messaging and in-person. Your.MD users in Scandinavia will also be able to have a remote consultation with an experienced healthcare professional via HelseTelefonen. Daily Yoga has also integrated its wellbeing app to provide intuitive and comprehensive yoga training, while various additional services will be provided by the NHS to UK residents.

Your.MD's launch partner, Samsung S Health - on which Your.MD is available on 400 million Samsung Galaxy Phones - and existing telemedicine service, Allianz Global Assistance, are already benefiting from the app's global footprint on iOS and Android devices and from the growing number of users accessing the service through chat on Slack, Telegram and now Facebook Messenger, WeChat and Kik.

Your.MD launched the beta version of its AI Personal Health Assistant in November 2015 on iOS and Android platforms, marking the world's first Personal Health Assistant to offer medical guidance through end-to-end AI, together with Machine Learning and Natural Language Processing. Your.MD has been researching and developing its AI offering since its establishment in December 2012. ■

Internet of Things (IoT) Healthcare Market is Expected to Reach $136.8 Billion, Worldwide, by 2021

According to a new report published by Allied Market Research titled, "World Internet of Things (IoT) Healthcare Market - Opportunities and Forecasts, 2014-2021", the world internet of things (IoT) healthcare market is expected to reach $136.8 billion by 2021, registering a CAGR of 12.5% between 2015 and 2021. Services and system & software segments collectively occupies a dominant share in the world IoT healthcare market and is expected to drive the growth over the forecast period. Patient monitoring application segment is expected to maintain its lead position with $72.7 billion by 2021.

The world IoT in healthcare market is anticipated to grow at a significant pace, owing to easy availability of wearable smart devices, increasing need for stringent regulations and decreasing cost of sensor technology. Furthermore, launch of technological advanced devices (smart shirts, smart lenses, smart bands and others) & analytics software, rising incidence rates of chronic diseases, surging demand for cost-effective treatment & disease management, better accessibility of high speed internet and implementation of favorable government regulatory policies, are also expected to fuel the growth of this market.

Improvement in healthcare infrastructure in developing economies, increase in government support, high R&D investments by major players for developing better IoT infrastructure are expected to offer potential growth opportunities to the market.

However, factors such as high costs associated with IoT infrastructure development, data privacy and security concerns, lack of awareness in developing economies and limited technical expertise are projected to restrain the market growth.

Services segment contributed for more than half of the market share in the overall IoT healthcare market in 2015. The segment covers architecture services for integration, consulting services for training & teaching and application development services for support & maintenance. Additionally, devices segment is expected to grow at highest growth rate during the forecast period owing to novel technological advancements and increasing popularity of wearable sensor devices.

Patient monitoring application segment is projected to dominate the market throughout the forecast period. The patient monitoring segment covers in-patient hospitalised patients, remote patient monitoring and tele-health services. High adoption of IoT services in remote patient monitoring and growing awareness among individuals would further foster the growth of patient monitoring segment.

Key findings of the study:

» Devices are projected to be the fastest growing segment in world internet of things (IoT) healthcare market at a CAGR of 16.6% during 2015 and 2021.
» Patient monitoring application segment is expected to continue to dominate the world internet of things (IoT) healthcare market throughout the forecast period.
» Healthcare providers (hospitals, doctors) and patient's end user segment would continue to lead the market, accounting for more than three fourth share in 2015.
» Fitness and wellness measurement application segment is expected to grow at a CAGR of 15.7% during the analysis period.
» Asia-Pacific is projected to be the fastest growing region in internet of things (IoT) healthcare market, registering a CAGR of 17.0% during 2015 and 2021.

The North American internet of things (IoT) healthcare market is projected to offer beneficial growth opportunities during the forecast period owing to well established healthcare infrastructure, high patient awareness, increasing government supports and high investment from major IoT players.

The key companies profiled in the report are Apple Inc., Cisco Systems Inc., GE Healthcare Ltd., Google (Alphabet), International Business Machines Corporation, Medtronic PLC, Microsoft Corporation, Qualcomm Life Inc., Proteus Digital Health, Koninklijke Philips N.V. and St. Jude Medical Inc. ■

Advisory Paper Identifies Priorities for Paperless UK NHS

A number of recommendations have been identified in an advisory paper suggesting how the NHS could be paper free by 2020. The paper outlines the results of discussions from the Health Insights series of regional workshops and conferences held in Autumn 2015. The events, which were run in partnership with NHS England, provided a platform for more than 500 health and care professionals to address fundamental questions about managing information through technology.

The main topics highlighted in the paper reflect what health and care professionals feel the NHS Technology agenda should focus on this year with ubiquitous Wi-Fi, information governance and patient access to data being the focal points.

The consensus felt that Wi-Fi was a basic innovation that should be in place and since last autumn the Department of Health has announced that free Wi-Fi will be provided in all NHS buildings, with a number of trusts having already made progress with estate-wide Wi-Fi.

Health and care professionals also deemed that information governance was a real obstacle on the road to interoperability and integrated working. Currently trusts have their own way of interpreting information governance and calls have been made for a single sharing information agreement.

Discussions around patient access to data was said to have the potential to empower patients and allow them to take ownership of their care. Implementing this would reduce cost and improve patient experience.

Other suggestions included:

- NHS 'Trip Advisor' style website
- Remote interaction with medical professionals
- Joining up NHS provider organisations in terms of data
- Simplifying the suppliers' costing model
- Enforcing suppliers to follow standards
- Transparency
- Unification of processes–more direction on how trusts operate
- Open API (application programming interface)
- Cultural change - encouraging information sharing

Delegates at the events were asked to put themselves in the role of patients and consider the impact the management of information and accessibility has in their everyday lives. They identified the following issues:

Unclear patient expectations

Health professionals felt it was unclear what patients wanted and called for more engagement with patient groups to ascertain their expectations. Although younger patients may have higher expectations of technology, the older generation may want to simply see a doctor.

Outdated technology

The general consensus was that patients would expect the NHS to be able to meet the IT standards citizens were used to in their own workplaces. Delegates said patients were surprised that the NHS had not moved with advances in technology and still used methods such as paper records, faxing and handwritten notes. It was suggested that 'patient power' could force the NHS to move with the times.

Lack of leadership

The strongest theme that emerged from the events was a plea for greater central direction. Many health professionals felt that local autonomy prevented the NHS making progress on a national level. There were calls for agreed leadership structures in localities. Delegates felt that leaders needed to define the key priorities, allowing providers of health informatics to work together with clear objectives and purpose.

Lack of integrated care

Delegates said that legacy systems made it difficult to share information. The inability of one part of the NHS to talk to another, let alone colleagues in social care came as a shock to patients. This is exacerbated by social services operating separately from CCGs (Clinical Commissioning Groups). As information does not follow patients, they may have to repeat their story several times leading to a poor patient experience.

Clinical reluctance

The medical profession can be reluctant to embrace change, often for good reasons such as need for training, lack of familiarity and concerns about safe practice. There was a perceived need to change the clinical mind-set around citizen access to information, which was seen as low priority in current care models.

Funding

Heath professions argued that IT solutions were useless if there is no budget for them. It was unclear where the budget would come from in terms of spending e.g. acute care, CCGs, ambulance, councils. Funding bids currently have to be trust-led as CCGs have looked at the systems available but cannot submit bids. It was suggested that incentives were put in commissioning targets for CCGs and clinicians.

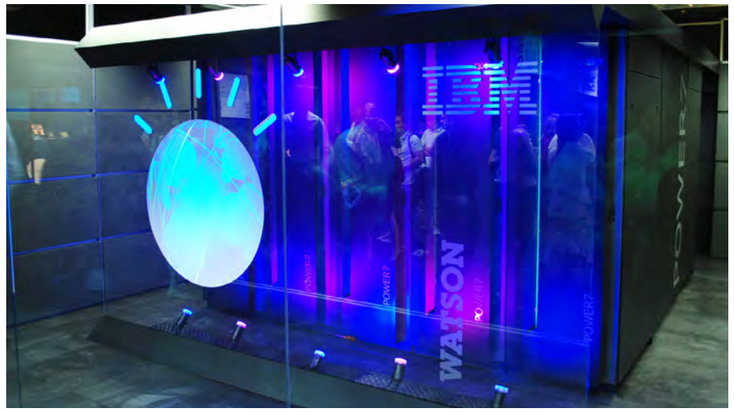
Lack of trust

Patients are not convinced their data is secure and have lower expectations of data security than they do for other sectors such as banking. This is partly due to a lack of credibility. Delegates felt that a customer service ethic was missing and the NHS needed to learn from the world of business to become more customer centric. This should include more transparency about the use of data and assurance in the security of sensitive data.

Since Autumn 2015 when these events took place, NHS England has put a number of measures in place towards the aim of having a paperless NHS by 2020. Health and care systems have been tasked to produce Local Digital Roadmaps by June 30, setting out how they intend to go paperless. The first two phases of this three-step process have been completed and the release of the NHS digital maturity index results have provided a baseline which gives a clearer indication of what needs to done. There has been a push towards ending the practice of sending referral letters by post, with NHS England setting out £55m to reward GPs and hospitals which make referrals completely digital by 2018. Plans to introduce better technology infrastructure to general practice were announced by NHS England head Simon Stevens in April. The General Practice Forward View proposes direct practice investment in technology to support better online tools and appointment, consultation and management systems. ■

World's First Emergency Room Solution Powered by IBM Watson

TeleMedCo™, a new company developing real time technology for emergency rooms and urgent care facilities designed to automate and improve the rapid diagnosis, triage and admission of patients leveraging IBM Watson's software and healthcare cloud, have demonstrated their platform, application, and mobile experience for the first time at GENBAND's Perspectives16 conference.



TeleMedCo selected GENBAND's Kandy platform as its provider of real time communications capabilities, including secure and HIPAA compliant instant messaging, voice services, and multi-party video collaboration all embedded in intuitive experiences connecting incoming patients and their care teams instantly.

The TeleMedCo platform, currently under development and expected to be in hospital trials by the end of 2016, takes standard emergency room protocols and programs them into a system with which incoming patients interact. Answering a series of questions and providing their personal information allows the system to access and share the appropriate Electronic Medical Records (EMR), order vitals and labs, and record the relevant data making it easier to access by doctors, specialists and other medical staff.

The result is faster and more accurate admissions and more efficient operations of Emergency Departments (EDs) which are currently under tremendous stress with increases in admittances and systemic understaffing problems.

Having Watson welcome and interview patients who come to an emergency facility will free up time for doctors and other healthcare personnel to see more patients and to focus on those requiring more urgent attention. Because of Watson's ability to read medical journals and research documents in real time and its vast pharmaceutical database, Watson will speed treatment and help to eliminate errors, thereby de-stressing the process. TeleMedCo solutions, powered by IBM Watson, will also update patient records, code and process insurance claims, and monitor patients for aftercare.

With Kandy's real time communications cloud capabilities integrated into the solution, should a patient need to speak with his or her doctor, the doctor will automatically be alerted and can open a voice call or video consult within seconds using a smartphone or tablet. If the primary doctor or specialist is not available, the alert will automatically hunt for the next professional associated with that patient's case.

"We are very proud to be the real time communications engine behind this project," said Paul Pluschkell, Founder and CEO of Kandy. "This solution can save time, money and even lives, and the opportunity to expand this from Emergency Rooms into other applications is extraordinary."

"I have been serving in Emergency Room settings for nearly 25 years," said Dr. Tina Miranda, Co-founder of TeleMedCo. "We have spent years not only studying this area, but working in this space, and we are passionate about this opportunity working with companies like IBM, GENBAND and others to pull together all the elements required to create something very special, and very scalable."

The systems integration and mobile application development for the demo was designed and implemented by Qualesce, a technology solutions and resourcing company.

"This is one of the most exciting projects I've ever contributed to," said Andy Asava, CEO of Qualesce. "It is an honour to work with true visionaries on something so important to each of us. The opportunity to massively reduce costs while making the experience of visiting the ED and treating patients better is nothing short of inspiring." ■

New Online Recruitment Platform Aims to Accelerate Pharmaceutical Development

The neuroscience and technology company Cambridge Cognition has launched its first web-based product, CANTAB Recruit, using the scientifically validated CANTAB® technology that is expected to open the door for home-based cognitive testing at scale.

CANTAB Recruit is an online patient recruitment portal for pharmaceutical and biotechnology companies to accelerate the identification of qualified clinical trial participants in high-need indications such as Alzheimer's disease.

The web-based platform promises to enrich clinical research by sensitively pre-screening patients using innovative, interactive and proven cognitive measures to reduce screen failure rates and save study sponsors substantial time and cost.

The launch of CANTAB Recruit follows the first showing on April 7th of the Company's new technology Cognition Kit™, the wearable platform that will enable doctors, scientists and the public to better understand and manage day-to-day brain health.

With CANTAB Connect, the cloud-based cognitive assessment system for clinical trials launched in 2014, and CANTAB Insight, the Company's Class II medical device for detecting the earliest signs of cognitive impairment, the Cambridge Cognition product portfolio now includes a range of multi-platform solutions for use throughout the drug development lifecycle and patient engagement.

Initially, the focus for CANTAB Recruit will be in Alzheimer's disease clinical trials. Currently, around 35.6 million people worldwide have dementia, forecast by Alzheimer's Disease International to increase to 115.4 million – or one in 85 people – by 2050, with Alzheimer's disease accounting for around 75% of cases.[1,2]

As the Alzheimer's disease field moves towards prevention[3], the challenge of bringing participants to research sites for early intervention trials has become a major bottleneck. Each new clinical trial, particularly those that target prodromal populations, may take as long as three years to complete enrolment, with screen-fail rates as high as 90%.[4]

The time and costs involved in patient recruitment are significant. Successful enrolment of participants regularly amounts to 32% of total trial costs[5] and 80% of trials are currently delayed by at least one month due to unfulfilled recruitment numbers, delaying studies by an average of 18 weeks[6], incurring further costs and delaying the time to market for new treatments.

Digital outreach using CANTAB Recruit is expected to make a significant reduction in the burden of work by the pharmaceutical companies sponsoring clinical trials by pre-screening before subjects visit their sites. This means that a much smaller percentage of subjects would be brought to the site for further assessment and screen failure rates could decrease significantly.[7]

In 2015, 59 industry-sponsored Alzheimer's disease clinical trials were initiated; a 28% increase from 2013,[8] and with prodromal Alzheimer's disease becoming a major research focus, CANTAB Recruit addresses a need in a growing market.

Cambridge Cognition is already in negotiations with pharmaceutical companies over the use of CANTAB Recruit to enrich their recruitment programmes. The Company predict that as the product demonstrates its value in Alzheimer's disease trials opportunities will develop in other neurological and psychiatric disorders, such as schizophrenia, Parkinson's disease and depression.

Steven Powell PhD, Chief Executive Officer, Cambridge Cognition: "Over the past two years we have been developing a suite of exciting and innovative new products to address a growing global challenge."

"Alongside our cloud-based cognitive assessment products for academic and clinical research and our CE marked healthcare products, CANTAB Recruit and Cognition Kit now position Cambridge Cognition strongly for growth and geographic expansion."

He continued: "The launch of these products is key to the Company's long-term strategy to become the leading provider of scientifically proven technology to improve the understanding, diagnosis and treatment of mental health and wellbeing worldwide."

References

1. Alzheimer's Association. (2010) Alzheimer's disease facts and figures. Alzheimers Dementia. 2010 Mar;6(2):158-94.
2. Alzheimer's Disease International. (2010) World Alzheimer Report 2010: The global economic impact of dementia. London.
3. Vellas B, Bateman R, Blennow K, Frisoni G, Johnson K, Katz R, et al. (2015). Endpoints for Pre-Dementia AD Trials: A Report from the EU/US/CTAD Task Force. J Prev Alzheimers Disease;2(2):128-35.
4. Aisen P, et al. (2015). Registries and Cohorts to Accelerate Early Phase Alzheimer's Trials. A Report from the E.U./U.S. Clinical Trials in Alzheimer's Disease Task Force.
5. Patient Recruitment and Clinical Vendor Fees Top Clinical Trial Cost Drivers. Cutting Edge Info.
6. Beasley D. (2006). Recruiting Special Patient Populations. Applied Clinical Trials.
7. Hughes, L. B. et al (2016). Innovative Digital Patient Recruitment Strategies in Prodromal Alzheimer's Disease Trials. Quintiles.
8. *ClinicalTrials.gov* ■

Validic Recognised for its Visionary Digital Health Platform

Based on its recent analysis of the healthcare data interoperability market, Frost & Sullivan has recognised Validic with the 2016 North America Frost & Sullivan Award for Visionary Innovation Leadership.

Validic's Digital Health Platform is a cloud-based data interoperability solution that facilitates the fluid and secure transfer of health information from a multitude of digital sources to key healthcare stakeholders, including providers, payers, health IT vendors, pharmaceutical companies and contract research organisations (CROs). This ability to enable a seamless connection to health insights from diverse data sources including in-home clinical devices, consumer health applications, biometric sensors and fitness wearables makes Validic, arguably, the most comprehensive and advanced connected health solution presently available in the market. Furthermore, by placing patients at the centre of the ecosystem, Validic is powering the transition to value-based care models.

Frost & Sullivan presents this award to a company that consistently develops new growth strategies based on a clear and holistic understanding of the current and future market, thus effectively addressing the relevant, and often at times complex, challenges and opportunities presented in healthcare.

Delivery of this award recognises Validic's tenacity and proven success in providing comprehensive digital health connectivity solutions that facilitate the simple and secure acquisition and integration of patient-generated health data.

While the Validic Connect™ solution links healthcare companies to the clinical and consumer health insights from digital technologies, Validic Mobile™ aids in the secure and easy data acquisition from various Bluetooth-enabled smart devices as well as non-connected, in-home legacy medical devices. These two innovative solutions have overcome the market's data capture obstacles and contribute to Validic's overall unmatched platform operation and market differentiators.

A key component of Validic Mobile™ is its latest technology offering, VitalSnap™. This proprietary, patent-pending technology enables real-time health data transfer from locked or non-connected legacy medical devices to health information technology (IT) systems. Users can capture health data from their legacy devices using their smartphone's camera and easily send the data to an electronic health record (EHR), patient portal or clinical dashboard.

"Since its inception, Validic has established itself as an industry leader and de facto standard in health data interoperability," said Greg Caressi, senior vice president, transformational health at Frost & Sullivan. "Validic continues to recognise and address the key challenges facing patients, clinicians and healthcare organisations, as well as the opportunities for growth and improvement, within this competitive and continuously-evolving space."

Unsurprisingly, Validic's digital health technology platform is proving to be disruptive in the enterprise health data connectivity space. As Validic's solution is meant to enhance and not replace the existing user interface or application workflows, stakeholders are able to transition at their own pace without compromising performance in the care setting.

Unlike most existing health IT solutions in the market, Validic's modular design allows the system workflows to be modified to fit specific end-user needs. Its solution is designed to simplify digital health implementation and data integration with existing healthcare applications, portals, dashboards and IT systems as well as be scalable and easily adaptable to new technologies.

Despite tough competition from industry-leading vendors offering end-to-end healthcare interoperability solutions, Validic's Digital Health Platform has proven to be a solid market differentiator in an increasingly crowded and competitive landscape. The company's early entry into the mHealth and digital health data integration sectors has established a strong footprint for the company in the healthcare industry for both providers and payers, while it continues to expand its presence in other areas of healthcare.

"Shifting government regulations, increasing sophistication of technology, and escalating patient demands for better access, affordability and outcomes are effectively changing the way healthcare systems operate, making access to patient data a critical element to success," noted Caressi. "For championing health data interoperability and advancing healthcare's transition to value-based care, this award is well-deserved."

Frost & Sullivan presents this award to the company that has demonstrated the understanding to leverage global Mega Trends and integrate their vision into processes to achieve strategic excellence. The Award recognises the efficacy of the recipient's innovative approach to health data interoperability and the impact it has on healthcare and society at large. ■

Collaboration Aims to Develop Digitally-connected Inhalers to Address Respiratory Diseases

Vectura Group plc and Propeller Health have announced a collaboration to develop inhalers that combine Vectura's proven dry powder inhaler ("DPI") technology with Propeller's FDA-cleared digital health platform.

Vectura is an independent pharmaceutical product development company that focuses on the development of inhaled pharmaceutical therapies for the treatment of respiratory diseases. The initial focus of the collaboration will be to develop an add-on sensor for Vectura's lever-operated multi-dose inhaler (LOMI). The hope is that patients using a Propeller-connected LOMI device will be more engaged with their care and better equipped to understand their disease and improve self-management.

Propeller provides the leading digital health platform for asthma and chronic obstructive pulmonary disease (COPD). With information from connected inhalers like LOMI, and its companion analytics and digital interfaces, Propeller helps individuals and their physicians improve the management and control of respiratory disease. The platform is used by more than 40 leading healthcare organisations across the US.

"This announcement demonstrates Vectura's commitment to develop next generation inhalation devices that can help patients manage their respiratory diseases better. Adherence to therapy is one of the major issues driving poor maintenance management of these chronic conditions. There is increasing evidence of the value of intelligent sensor technology significantly enabling a reduction of symptoms, including exacerbations and long term healthcare utilisation costs. This collaboration is a first step towards Vectura embracing a connected solution for all our devices" commented James Ward-Lilley CEO, Vectura.

Founded in 2010, Propeller is the leading provider of an FDA-cleared digital health platform that helps reduce the cost of care while delivering better quality of life for individuals with chronic respiratory disease.

"Digital health has the potential to make respiratory therapies more personal, powerful and convenient for every patient. We are excited to work with the team at Vectura to realise these benefits in a new generation of inhalers" said David Van Sickle, CEO, Propeller Health. ■

ARANZ Medical Named New Zealand's Hi-Tech Emerging Company of the Year

ARANZ Medical Ltd a specialist in 3D scanning and informatics solutions for the healthcare sector has been named the Coretex Hi-Tech Emerging Company of the Year at the New Zealand Hi-Tech Awards 2016.

Dr Bruce Davey, CEO of ARANZ Medical says, "This is a fantastic acknowledgement for our team. It's really good to be recognised for the work we are doing to reduce the burden healthcare internationally. Our products are used in 35 countries around the world from Sub-Saharan Africa through to some of the biggest healthcare providers in the United States and United Kingdom."

ARANZ Medical's solutions for skin and wound assessment transform clinical assessment processes, improve quality of care, and make healthcare more cost-effective. Key innovations include: Silhouette, an FDA-approved advanced wound surveillance system which supports precise and productive wound management in clinical practice and research; and FastSCAN which enables the custom-fit of orthotics and prosthetics.

A NZ Hi-Tech Award is one of the technology sector's most sought-after accolades. They have been awarded over the years to New Zealand's most successful high-tech companies, and highest achieving individuals. ■

American Well Introduces the Exchange, Connecting Telehealth Supply and Demand Online

American Well, a national telehealth technology and services company, has announced its newest enterprise telehealth service, the Exchange, and the first American Well partners to enter it – Cleveland Clinic, Nemours Children's Health System and LiveHealth® Online. The Exchange allows healthcare organisations, for the first time, to redistribute their services online to new patient populations.

"The Exchange breaks down silos of healthcare delivery and connects every stakeholder in the industry – those who seek care, deliver care, and pay for it – to make great, trusted healthcare more accessible," said Dr. Roy Schoenberg, CEO, co-founder, American Well.

Added Dr. Schoenberg, "We want to do for healthcare what Amazon did for book stores initially, and online retail, ultimately, which is to establish a national platform on which online healthcare runs. Importantly this platform is not just about connecting consumers to more doctors. Rather, we can connect consumers with the best provider brands across the United States as part of a national, virtual healthcare system."

For many years American Well's partners have built best-in-class telehealth programs that leverage their unique brands, provider expertise, clinical services, technologies, and unique ties to their local communities. These partners have typically fallen into one of two categories – supply generators (organisations that supply healthcare services, such as a hospital or health system) and demand generators (organisations that generate consumer demand, such as a health insurer or employer).

With the Exchange, the virtual barriers between the supply and demand generators and their distinct telehealth services are lifted. Now, these organisations can connect and exchange their services with one another, instantly, online. As such, a new opportunity emerges for healthcare providers looking to 'package' up care and population programs into telehealth 'products' (e.g. programs for hypertension, diabetes, cancer, Parkinson's) and market and distribute them to payers and employers – all through the Exchange.

Healthcare leaders operating on American Well's technology that have already entered the Exchange to take advantage of this new mode of redistributing care delivery to new patient populations include:

» Cleveland Clinic and LiveHealth® Online: Cleveland Clinic will begin offering its services on the LiveHealth Online platform, a telehealth service for live, video consults with a provider to obtain diagnosis and receive treatment for common urgent care conditions, 24 hours a day, seven days a week. Consumers who access LiveHealth® Online in Ohio, West Virginia and Pennsylvania can connect with Cleveland Clinic Nurse Practitioners for live video con-

Continued on page 16

Continued from page 15

sults on-demand. This is a premium experience for consumers, connecting them with one of the leading institutions in care delivery.

» Nemours Children's Health System and Amwell: Nemours Children's Health System, headquartered in Florida, is one of the nation's leading paediatric health systems. Nemours CareConnect is a service that leverages American Well technology to offer paediatric video consults in Delaware, Florida and Pennsylvania. Through the Exchange, consumers in Florida who use American Well's consumer telehealth platform, Amwell, will have access to Nemours' board-certified paediatricians 24 hours a day, seven days a week. Later this year, Nemours will expand this service to Delaware and Pennsylvania.

The Exchange is made possible through advancements in technology, telehealth adoption and a favourable regulatory climate. American Well's robust technology platform and sophisticated switchboard engine operate 'under the hood' of the Exchange. In February 2016, American Well also introduced the first Mobile Telehealth Software Development Kit (SDK) which lets organisations plug telehealth capabilities directly into their own consumer-facing mobile apps. With the Exchange, these consumer-facing apps can now tap directly into services from American Well's partners.

As the technology advances and more consumers seek virtual doctor visits, so too does the number of healthcare organisations adopting new telehealth services and making for a rich online ecosystem for collaboration. In American Well's network alone there are: more than 40 health systems; more than 40 independent health plans; and thousands of employers – all of which can now enter the Exchange. Today more than 100 million consumers have access to American Well technology through its work with these organisations.

The regulatory climate is also becoming increasingly favourable to cross-pollination of healthcare services, across state lines. In 2015, the Federation of State Medical Boards introduced a new, expedited pathway to licensure for qualified physicians who wish to practice in multiple states, called the Interstate Medical Licensure Compact. The process to obtain expedited licensing is coming in summer 2016, after which multistate telemedicine licenses will be issued to any doctor who wants it. This means that provider organisations entering the Exchange and redistributing their services in other geographies can expect expedited, multistate licensure for their physicians. ■

Digital Surgical Aftercare Program Helps Patients Meet Long-Term Weight Loss Goals

In a collaboration between Zillion and Apollo Endosurgery, the two companies have announced that they will develop an on-demand telehealth program to provide virtual aftercare support tailored to meet the needs of patients who undergo the FDA-approved ORBERA® Gastric Balloon, an incision-less, non-surgical weight loss procedure.

Powered by Zillion's digital health platform, patients who have undergone the ORBERA® balloon procedure now have access to an individually tailored, 12-month program designed to support the patient in developing sustainable, healthy habits that can be maintained well beyond the device's lifetime. The program provides access to a team of experts, via live video conferencing, including registered dieticians, psychologists and exercise physiologists.

"Apollo's mission has always been to develop safe, effective and innovative solutions for weight loss and provide patients with the support they need to be successful with long-term weight loss," said Todd Newton, chief executive officer of Apollo Endosurgery. "With ORBERA® Coach, patients now have 24/7 access to tools that can assist them along their weight loss journey and keep them focused on reaching and maintaining their fitness and nutrition goals."

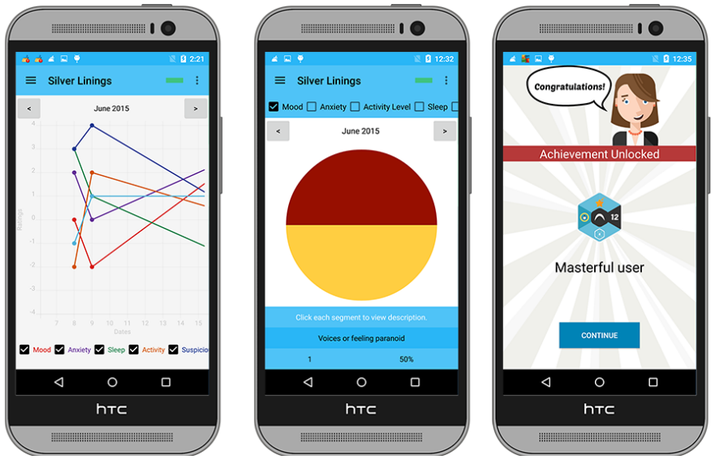
Zillion's technology platform enables ORBERA® Coach patients to interact anytime, anywhere via face-to-face live video conferencing, including one-to-one, group and webcast scheduled or on-demand. The technology also facilitates weight loss tracking, a health and wellness content library, a personal journal to monitor and reflect on progress, and a collection of recipes and meal plans geared toward healthy eating. ORBERA® Coach can similarly provide significant data for the physician to assist in managing patients.

"Our partnership with Apollo Endosurgery underscores the mission of our company—enabling consumers to take control of their health and providing support that extends beyond visits to a healthcare provider," said Bill Van Wyck, president and chief innovation officer of Zillion. "In order to see long-term, sustainable results, patients need access to easily accessible engagement tools to help them on the path to a healthier lifestyle."

To date, more than 220,000 of the ORBERA® balloons have been distributed in over 80 countries with approximately 230 published papers documenting its clinical results. ■

Find out what's on across the mHealth industry in our Upcoming Events section on page 44

42% of US Consumers Using Digital Health Services Say Their Data Goes Nowhere



Using digital health tools in primary care could save the US healthcare system $10 billion annually, according to Accenture. But nearly half (46 per cent) of Americans who use digital health tools say the data collected by these tools is not incorporated into their healthcare. Despite the growing adoption of activity trackers, smart watches, health applications and other internet-connected health technologies, 42 per cent of digital health users say the data gathered by these tools goes nowhere.

The findings, of the HealthMine Digital Health Report: The State and Impact of Digital Health Tools, are based on a survey of 500 consumers who use digital health tools.

As the aging population and prevalence of chronic disease in America grows, internet-connected health devices and applications have the ability to help support primary and specialty healthcare. Digital health tools can also improve consumers' direct visibility into and control over their vital health metrics and ongoing healthcare needs.

There are now nearly 165,000 health-related apps that run on Apple's iOS and Google's Android. PwC, a consulting firm, forecasts that by 2017 such apps will have been downloaded 1.7 billion times. Add to that 10 million activity trackers and 7 million smart watches shipped by the end of 2014 (ABI Research), as well as a growing crop of other internet-connected health devices. These tools have the potential to help consumers become more engaged in their own health and they can also facilitate more convenient and cost-effective healthcare.

However, what this report illustrates is that digital health tools still have a long way to go in order to reach their full potential. Tracking personal health and medical conditions has become more about the quantified-self - providing users with useful, quantified data about themselves - and much less about having an actual impact on healthcare provision.

46 per cent of respondents reported that their doctors are not using digital health data in guiding healthcare provision and this is significant. Many of the purported benefits of digital health are associated with providing new ways for doctors and healthcare professionals to interact with their patients and gain a much fuller picture of their overall health. Despite the surge of digital health solution usage across the healthcare industry there still seems to be a reluctance to use patient-generated data and this is something that the industry as a whole needs to address.

Other key findings from the report include:

» The most popular digital health tools today are fitness and exercise apps (50 per cent). Disease management, smoking cessation and telemedicine have the lowest adoption of all digital health tools.

» 75 per cent of consumers who use mobile/internet-connected health applications are willing to share the data they collect with their doctor/healthcare provider, but only 32 per cent say this happens automatically.

» 60 per cent of digital health users say they have electronic health records (EHRs), but only 22 per cent use them to help make medical decisions.

» 93 per cent of consumers who used telemedicine say it lowers their healthcare costs, but 39 per cent of digital health users still haven't even heard of telemedicine.

» 76 per cent who use digital health tools say they improve health, and 57 per cent say digital health tools lower their healthcare costs.

» 52 per cent of digital health users are enrolled in a wellness program, and 33 per cent received their health app/device from their wellness program. But while 59 per cent suffer from a chronic condition, only 7 per cent of these individuals are using a disease management tool.

Bryce Williams, CEO and President of HealthMine said, "Digital Health is still crossing the chasm from lifestyle and fitness management to chronic disease and holistic healthcare management." He continued, "Digital analysis of health data can provide an early warning detection system for individuals and plan sponsors. Finding a person with pre-diabetes, for example, can lead to an improved outcome and lower cost for the member and the plan sponsor."

The full report can be downloaded at *http://www.healthmine.com/health-mine-digital-health-report.* ■

NHS Foundation Trust Adopts Population Health Solution to Deliver Integrated Care

By Matthew Driver

Salford Royal NHS Foundation Trust is hoping to continue its market leading adoption of digital technologies as it becomes the first United Kingdom client to introduce population health management solutions from technology partner Allscripts.

Salford Royal NHS Foundation Trust is expanding its partnership with Allscripts by selecting CareInMotion, Allscripts' population health management platform, to help make the transition to a new model of integrated care.

CareInMotion's dbMotion, is an industry-leading data connectivity and harmonisation solution that helps healthcare organisations meaningfully share data across disparate systems within clinicians' workflows. The solution provides a comprehensive, adaptable framework that enables healthcare organisations to address their specific population health priorities, such as predictive analytics, care coordination and patient engagement.

Salford Royal is a large teaching NHS Trust that provides community and hospital services, with 728 beds and more than 7,000 staff. Already a forward-thinking organisation when it comes to the use of technology-enabled care provision, the Trust is ranked number one in the UK NHS' CDMI (Clinical Digital Maturity Index).

NHS England also recently selected Salford Royal as one of 29 vanguard sites tasked with developing new models of care. CareInMotion supports Salford Royal's overall population health strategy by helping the organisation develop a new integrated care model that meets the health and social care needs of the community. The system will connect the existing integrated EHR to the broader community to provide safer and more efficient care. Initially, Allscripts will connect Salford's Acute and General Practitioner primary care physicians, providing a comprehensive view of patient information to enable fully informed care decisions. Future phases are expected to explore expanded connectivity to the region's mental health and social care organisations.

"Salford Royal NHS Foundation Trust chose Allscripts as a key partner to help our organisation evolve to meet the demands of population health management and empower our care providers with the data they need to make informed decisions around patient care," said Rachel Dunscombe, Chief Information Officer, Salford Royal NHS Foundation Trust. "Working with Allscripts will help our organisation adopt more efficient, value-added care models to improve patient outcomes."

"The healthcare industry faces considerable challenges with aging population and patients with multiple comorbidities, which is placing a huge strain on services. The UK has a strategic

imperative to improve the quality of care and to do so at a lower cost. Simultaneously, there is a need to improve the efficiency of care provision whilst shifting to proactive management of health of populations." comments Steven Brain, Managing Director of Allscripts UK.

Salford Royal and the Salford CCG are hoping that the move will help them take another significant step forward in improving the efficiency and the quality of care that they provide to their local population by ensuring that all clinicians have access to all relevant patent information no matter where that data resides.

"Critical to transformation and the introduction of new models of care is having all the information in the right place at the right time." Brain continues. "CareInMotion will connect a number of care providers in the region: Salford Royal; the CCG; Social Care Providers; and Greater Manchester Mental Health Services with the eventual aim of also connecting voluntary and independent sector organisations. With this they will be able to provide clinicians with proactive alerting that delivers context based information from across disparate systems as well as allowing access to all of the necessary information needed to treat an individual patient. The system will also ensure that clinicians are better informed about the care that their patients are receiving in other settings so that they can support those patients beyond the hospital environment."

CareInMotion's dbMotion is a comprehensive and adaptable platform that enables efficient population health management solution through a series of four principle components. These include: Care Coordination; Patient Engagement; Connectivity and Data Aggregation; and, finally Analytics.

"We think that these things combined can enable the shift from fee-for-service to value-based care delivery models." said Brain. "When you have these components, you can empower health-

Continued on page 20

Continued from page 19

care organisations to improve their quality and performance whilst optimally managing costs. By having these elements in place you can also make the shift from proactive to reactive care provision, and ultimately to predictive care. By integrating with our Electronic Patient Record (EPR) then Salford will end up with a community- aware EPR, which is what makes this project really exciting."

Salford Royal will adopt the CareInMotion platform in two phases. The first phase will look at care coordination alongside connectivity and data aggregation meaning that they will be able to provide all relevant data to clinicians, when needed. This data is normalised so that care providers are only given the most relevant data to allow them to make the best decisions. Once the system has been fully integrated and established then the Trust hopes to move into a second phase that will see the introduction of analytics and patient engagement, in a move that will enable the Trust to become predictive and proactive in the ways that they deliver care.

Brain describes the complexities involved with this progression. "In terms of proactive care we are talking about quite a seismic shift in the way that care is delivered. If you think about how things work today - the patient turns up; they are diagnosed; a care plan is developed; the patient is treated and sent on their way. But, when you move to be more proactive in the way that you manage diseases, or how you manage the health of a population, you need to be looking far in advance and preventing people from turning up. So you are trying to identify problems before they occur."

In one example, where the Allscripts' population health management solution was adopted by a sizeable Accountable Care Organisation, in the USA, analysis of their data revealed twice as many patients with diabetes, residing within their region, than had been previously thought. By identifying these patients sooner they were able to establish proactive care plans and manage the health of these patients in ways that allowed them to intervene before they required hospitalisation.

For Salford, the project will mean having all of the necessary clinical information available when, and where, it is needed, so that care can be administered earlier, correctly, and in a more modern and effective way. The predicted returns on investment are expected to be reductions in the length of hospital stays, faster turnaround in terms of delivering positive outcomes, and an increase in throughput of patients within the organisation, as a consequence.

"There haven't been many projects of this nature with the English NHS and so this is fairly new ground for us." explains Brain. "We have previously focused on our electronic patient records solutions but with the shift from fee-for-service to value-based care we are seeing a lot of interest in solutions like CareInMotion. Moving to delivering population management solutions is all about transformation and as such we are putting clinicians through a lot of changes, probably more than in most industries, and so it is crucial that we impart a good understanding of the 'why' we are embarking upon this change and have a good change management programme in place to do this. This is what we have done with Salford Royal."

"Salford Royal NHS Foundation Trust continues to demonstrate commitment to addressing the evolving healthcare needs in the United Kingdom by innovating and investing in population health management solutions to help provide better outcomes for patients," said Rich Berner, President, Allscripts International and Acute General Manager. "Population health management is not one size fits all, and we look forward to working closely with Salford Royal NHS to develop new and innovative care models that meet the specific needs of its community." ■

The Digital Promise of a Paperless NHS

Jonathan Elliott, General Manager, Health Sector at Xerox UK, considers the NHS' paperless goals and the reality of its journey towards digital transformation.

Since the UK Government announced plans to invest £4.2 billion in NHS technology over the next five years, with the aim of eliminating paper from the organisation by 2020, conversation around digital technology in public healthcare has exploded. High on the Department of Health's agenda for some time now, the transition is expected to drive billions in cost savings and improve health services across the board.

It's time digital transformation is tackled head on; it holds substantial promise for not just the NHS but the healthcare industry as a whole. Digitising processes is crucial in enabling healthcare to work better and smarter. Dated records management processes are costing health professionals' hours of valuable time.

We're strong advocates of the less-paper approach and with new technologies accelerating the development of artificial intelligence, big data and cloud-based services, there are many ways in which efficiency in a healthcare setting can be improved. So what needs to happen for the biggest public sector organisation in the UK to make the less-paper dream a reality?

Digital transformation: a stalled promise?

Only recently, NHS England shared the results of the trusts' digital maturity self-assessments, to reveal the overall 'readiness' for a paperless NHS. The data showed a very mixed picture, that reinforced the unique challenges faced by each trust. With some achieving a 'readiness' score of nearly 100 per cent when assessing their digital maturity, others met scores of 28 per cent, falling within the bottom few of the 239 surveyed.

Challenging existing practices and workflows is a daunting and somewhat alien task. A 'one size fits all' approach is not appropriate due to the complexity of the current IT infrastructures in place, so naturally, lasting digital strategies will be implemented at different stages. The NHS employs 1.5 million people, the roles of clinicians and administrators differ from trust to trust, as well as the operating paper-based records systems. Although each of the trusts is working towards the same paperless goal, progress and timing vary.

NHS England's head of technology strategy commented that, "while it is necessary to have all the technology and kit available, it is far from sufficient to ensure benefits are being optimised".

I am firmly behind this, as when a trust's capabilities, infrastructure and readiness are not aligned, this is largely when the promise of digitisation is stalled. When this occurs, there is bound to be disconnect between the vision to go paperless and the actual steps required to achieve successful transformation.

Driving digitisation

Digitisation within this context is not about following a set of procedures and is both complex and long term. However, getting a visual on paper processes and identifying the manual workflows draining valuable resources are key starting points for those in the industry looking to get a strong handle on their processes.

» Visualising paper workflows

The latest findings from Xerox's Digitisation at Work report revealed a huge amount of organisations are missing the upfront analysis of how paper processes are currently running.

The NHS is far from your average enterprise but this problem is particularly pertinent to the wider healthcare industry. Delivering the highest level of patient care requires an efficient clinical and administrative operation, removed from immense quantities of paper. Getting a visual on paper workflows is the first step in streamlining how such processes can be better managed, when working towards the end goal of providing clinicians and administrators with easy, secure access to medical records from any location, at any time.

» Embrace automation

We've already seen automated prescription systems put into place by hospitals to slash medicine bills and going forward, we can expect to see automation processes embraced further to streamline processes, particularly that of 'intelligent paper' recognition for the purpose of rationalising data forms.

It's time hospitals replaced manual workflows and the management systems featuring 'Intelligent paper' recognition are particularly efficient in making this change. Data entry forms are standardised using 'intelligent paper' to provide efficient data capture – converting paper forms into electronic versions that can directly enter data into the EMR system. Electronic records with 'intelligent paper recognition' are saving time, money and space for Luton and Dunstable University Hospital and leading to better patient care.

Streamlining operational costs

To continue in the right direction regarding the adoption of digital tech in public healthcare, as well as from visualising paper workflows and prioritising automation, we can also learn a lot from the successes that have occurred to date. Certain case studies prove what is possible from digitisation, as well as how certain challenges can be overcome.

At Xerox, we are doing what we can to be a partner to the NHS on the paper to digital journey. We've worked with a number of NHS trusts, such as Worcestershire Acute Hospitals NHS Trust, to digitise their paper-based records processes. We've also seen success through introducing hybrid mail platforms to hospitals; a move that is making it easier for patients to secure an appointment through email and SMS based correspondence. A centralised, digital resource for postal mail management is key in reducing the cost of physical and electronic mail.

We're also currently in partnership with Luton and Dunstable University Hospital, enabling a move to an electronic medical records system that is projected to generate £2.2 million in net benefits.

The key challenge in the case of Luton and Dunstable Hospital was the cost of operating their paper-based records system which was costing them millions of pounds to run. In addition:

- » The paper medical records had the potential to be misfiled or even lost, leading to delays at the point of care.
- » Only one clinician or administrator could access a paper file at any time, creating bottlenecks when multiple experts across locations were needed to make healthcare decisions.
- » Continuity of care was a challenge, as it was difficult for paper records to follow a patient across a series of treatments and care sites.

We proposed creating a single unified records management system full process automation, which led to the hospital signing a 10-year contract with us. Since then, a team effort has seen an electronic document and records management system (EDRMS) rolled out in three stages.

The initial stage was streamlining current paper operations, with all paper records barcoded for easier filing and retrieving. Rationalising data forms followed, with data entry forms standardised using 'intelligent paper'. The third stage has seen paper-based patient records phased out, as the hospital rolls out the new electronic medical records system.

The results? Clinicians and administrators now have easy and secure access to medical records and the trust has seen significant cost savings in staffing optimisation and paper storage.

Paving the way for transformation

A vital takeaway here is the minimisation of risk by going digital in stages. Carefully and diligently phasing out paper files is key to ensuring essential and important data is not lost along the way. Each phase of implementation must be tailored to the individual needs of the trust at hand.

Our work with both Worcestershire Acute Hospitals NHS Trust and Luton and Dunstable University Hospital demonstrate solutions that deliver in reining in labour and material costs, whilst making medical records more accessible to clinicians and administrators.

We have seen proven results. But there is huge potential for such processes to be replicated at scale across the broader NHS and make a real difference to way in which the service operates; for us it's incredible to see this journey unfold. ■

Global Research Reveals Emerging Markets are Leading the Adoption of Connected Health Technologies

The results of an international research project, commissioned by Philips, have revealed how prepared different countries, around the world, are to embrace the benefits of connected digital health systems and data sharing.

The first Philips' Future Health Index (FHI) is an extensive international study which explores how countries around the world are positioned to meet long-term global health challenges through integration and connected care technologies. Examining the perceptions, behaviours and attitudes of patients and healthcare professionals, the Future Health Index focuses on three important factors necessary to move toward a more integrated system of healthcare: access to healthcare; integration of the current health system; and adoption of connected health technology devices and systems.

While the data illustrates the growing opportunity for digital technology to drive healthcare transformation, the Future Health Index also reveals varying levels of readiness across markets and unveils opportunities for improvement to encourage broader user adoption globally.

Over three-quarters (76%) of healthcare professionals in developed markets agree their patients have access to the treatments needed for current and future medical conditions, versus just over half (58%) of those in emerging markets. However, emerging markets such as South Africa and the UAE appear to be leading the way in terms of connected device adoption, and more practitioners in emerging economies expect connected devices to be used to manage health in the future.

The study, which will be run annually, was conducted in partnership with an independent global market research firm in 13 countries in recent months. More than 2,600 healthcare professionals and 25,000 patients were questioned in Australia, Brazil, China, France, Germany, Japan, The Netherlands, Singapore, South Africa, Sweden, UAE, U.K. and U.S.

Assigning each country surveyed an average score out of 100, the FHI report shows the perceived state of readiness of each market to benefit from integration across healthcare systems. The United Arab Emirates achieved the highest score - 65.3 – among participating nations, with The Netherlands and China also coming in high, with scores of 58.9 and 58.1, while Germany, Brazil and Japan received the lowest scores in terms of readiness, at 54.5, 50.6 and 49.0, respectively.
A principle aim of the Future Health Index was to uncover answers to a number of questions, which are critical to the changing landscape of healthcare provision, these included:

» Is the current state of healthcare systems as fractured as we think it is?
» Are integrated health and connected care technology a realistic and accepted solution to the global health challenge?
» What are the barriers to healthcare systems realising the benefits of these solution?

"The Future Health Index has uncovered a number of significant areas where healthcare systems must transform if they are going to succeed in delivering long-term value-based care," said Frans van Houten, CEO of Royal Philips. "However, it is encouraging to see many countries are starting from a reasonably strong position in their readiness to adopt the connected digital technologies which will ultimately drive transformation. The FHI provides valuable insight for patients, healthcare professionals and policymakers – in both developed and emerging markets – on where attention needs to be focused to increase their respective levels of access, integration and adoption of health technology to improve healthcare outcomes and patient experience in the long term."

Rank	Country	Index (0-100 Points)	Access (0-100 Points) Highlighted boxes indicate score is above 13 market average for the Sub-Index	Integration	Adoption
1	United Arab Emirates	***65.3***	72.1	60.0	63.9
2	The Netherlands	***58.9***	72.4	58.8	45.5
3	China	***58.1***	64.8	57.3	52.1
4	Australia	***57.9***	71.5	55.1	47.2
5	Singapore	***57.7***	70.1	54.8	48.2
6	United States	***57.4***	68.4	54.7	49.0
7	Sweden	***57.3***	64.0	60.9	46.9
8	South Africa	***56.7***	63.2	55.3	51.6
9	United Kingdom	***56.4***	70.2	53.7	45.3
10	France	***54.6***	66.9	54.4	42.6
11	Germany	***54.5***	69.2	52.8	41.5
12	Brazil	***50.6***	45.4	57.0	49.4
13	Japan	***49.0***	57.9	50.7	38.4
13 market average		***56.3***	**65.7**	**55.6**	**47.6**

Other key findings from the FHI study showed:

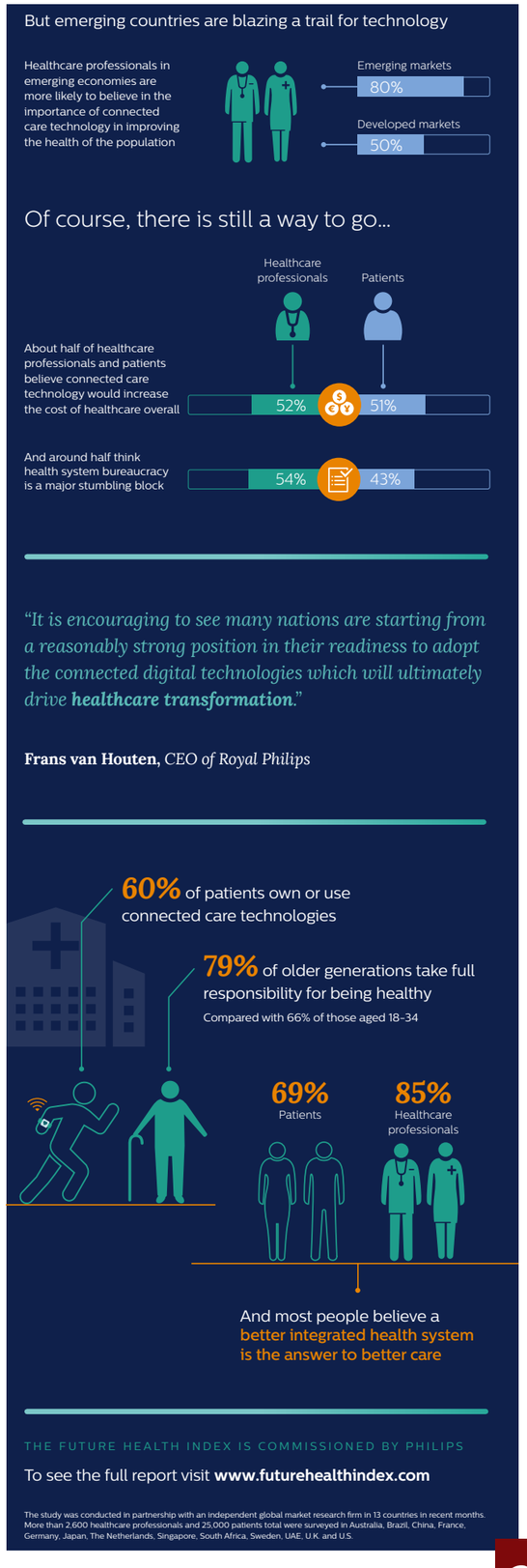
Data is proliferating, but data sharing continues to be a challenge. Despite progress towards universal medical records in some markets, the vast majority of patients (74%) report having to repeat the same information to multiple healthcare professionals, and most (60%) have also experienced repeatedly taking the same tests. Meanwhile, even though more than half (57%) of patients own or use a connected care device to monitor various health indicators, only one third of these patients (33%) have ever shared this information with their doctor.

Technology is a generational issue, for both doctors and patients. Across the countries surveyed, younger patients and doctors alike are more likely to use, and share information from, connected devices than their older peers. Over half (57%) of patients aged 18-34 report owning at least one health monitoring device, and one-quarter (25%) feel they are knowledgeable about connected care devices, versus 14% of those aged 55 and older.

Patients and doctors are divided in perceptions of patients' ability to monitor their own health. A clear majority of patients surveyed (69%) feel they have the knowledge to manage their own health effectively. However, less than half of practitioners (46%) agree. Perception gaps also exist in terms of who is responsible for preventing poor health. As patients age, they are more likely to believe they are the guardians of their own health – 79% of those 55 years or older agree they are fully responsible for preventing poor health compared to younger patients (66% of those aged 18-34 globally).

Integration and data sharing are worth pursuing. Sizeable major-

Continued on page 24



Continued from page 23

ities of both patients and healthcare professionals (69% and 85%, respectively) believe integrated health systems and connected technologies can improve the quality of care for patients, and most doctors (88%) agree that integration can have a direct positive impact on population health management.

Specific areas of improvement must be addressed to increase broader user adoption globally. Bureaucracy is seen as a major stumbling block. Over half (54%) of healthcare professionals and 43% of patients indicate health system bureaucracy is a major barrier to further coordinate data information sharing and integration of healthcare systems in their countries.

Cost, training and data security concerns are standing in the way. Over half of healthcare professionals and patients (52% and 51%, respectively) believe connected care devices would increase the cost of healthcare overall, with worries about resources needed for associated needs, such as training and data security contributing to overall concerns.

In announcing the news Pieter Nota – CEO of Personal Health for Philips said, "In order to improve the quality, access and affordability of care, healthcare systems need to shift their focus from hospital based acute care to new models of integrated, coordinated care along the health continuum, that is from healthy living and prevention, to diagnosis, treatment and home care. The healthcare industry is transforming to cope with the pressures from an aging population, a shortage of qualified health workers, and spiralling healthcare costs. We are seeing a shift to value or outcome based healthcare and consumers becoming increasingly engaged in their health and care shifting to lower cost care settings and homes. As a company we aim to play a leading role in this transformation and improve the lives of billions of people."

The full report is available at *www.futurehealthindex.com* ■

Improving Quality of Care and the Efficiency of Delivery by Going Mobile

By Matthew Driver

In a growing trend to reduce development costs and address real clinical needs, NHS Trusts in the UK are increasingly looking to develop in-house capabilities for mobile IT development.

With key government targets to go paperless by 2020, many NHS organisations are rapidly adopting mobile technologies across different care and administration settings as a means of providing convenient access to electronic data in a relevant contextual format. With this growing demand for mobile solutions, many NHS organisations are looking to build internal expertise that can enable them to rapidly and efficiently develop bespoke mobile systems that meet the needs of clinicians and staff within their organisation.

The Hillingdon Hospitals NHS Foundation Trust is one example of this trend. When clinicians at the Trust became the first in the country to access patients' Co-ordinate My Care alerts through a mobile application, there was an immediate impact.

For the first time, doctors, nurses and other healthcare professionals in the hospital were presented with important flags and information on their iPad Minis, telling them which patients were on end of life care pathways and details of individual wishes. Using the solution clinicians are able to recognise palliative care patients at a glance, and, as a result, can more immediately understand each patient's needs and circumstances, to ensure that appropriate and compassionate care is delivered at a crucial point in those patient's lives.

Mobilising clinicians and allowing them to securely access a local digital care record on any device, any platform and anywhere is a key priority for the Trust.

"We are moving away from the days of clinicians queuing to access PCs to retrieve information from different screens that demand impractical multiple log-ins." explains Matthew Kybert, Systems Development & Integration Manager at The Hillingdon Hospitals NHS Foundation Trust, in an interview with The Journal of mHealth.

"Working towards our informatics strategy, the Trust has deployed a mobile app platform that allows staff to see one, central holistic record of a patient, known as the HCR, with encounter history from the Trust Patient Administration System (PAS), clinical documents and letters from a variety of systems. Diagnostic results for pathology and radiology, and the GP summary record have also been made securely available through the app to authorised users, and the benefits for clinicians and the patients they serve has been significant."

Since introducing this access to information in a mobile form, the organisation has found that it is able to address real clinical needs. Bringing information from the Co-ordinate My Care system into the app is only one example of this, although the Trust's palliative care professionals are now amongst the highest users of the app.

"We have improved patient safety." continues Kybert. "Access to crucial information from the Medical Interoperability Gateway (MIG), for example, is of particular benefit to staff working on the acute medical unit, in A&E and our pharmacists, who can now quickly understand, from local GP records, a patient's current medication and drug allergies when they arrive at the hospital."

"Integration of this type of information along with clinical correspondence, diagnostics, and other crucial intelligence all in one place, is allowing nurses and doctors to find out about their patients' existing conditions far more quickly.

Our staff in A&E now avoid the delays of logging onto in-demand PCs, meaning faster information at the point of care when emergencies arrive."

In describing the rationale behind the project, Kybert said; "The key objective has been to provide faster access to the electronic information at the point of care and increase the quality of care and the efficiency of that delivery. We also aim to improve patient safety, and support changes in clinical working practices to move towards paperless records."

A wide number of very real and important clinical priorities are now being addressed through the mobile Hillingdon Care Record (HCR), a project that is delivering mobile access to integrated information from a wide range of systems, and allowing care to be better coordinated both within the hospital and beyond, into the community.

Following the introduction of the mobile solution, the Trust has seen an impact on quality in both clinical and non-clinical settings. Ambulatory care is one example where the system has significantly improved workflows. Using the application care teams can quickly generate appointment summaries that detail what has taken place, which can then be taken home by the patient. Feedback received by the organisation suggests that this has had an extremely positive impact upon patients, who feel empowered to manage their condition when they leave that service. Prior to having the system in place staff would have to rely upon written letters, which were typed up from notes, and sent to GPs. Not only was this time consuming and resource-intensive letters would often arrive with GPs after patients had already been seen for follow up appointments, making them fairly redundant. The new solution means that all stakeholders in the care equation have access to the same information in a real time fashion.

Beyond clinical care the solution is also having an impact in administrative areas of operations. For clinical coding teams the solution has greatly improved the speed at which they can code activity, reducing the need to log-in to multiple systems in order to obtain necessary information.

On the issue of developing the capabilities to develop and deliver a mobile project of this nature, within the Trust, Kybert said; "At the start of this journey, the Trust did not have the toolset needed to develop secure mobile applications so we needed to find a way to develop our internal capabilities to quickly replace paper and desktop processes with mobile solutions."

"The Trust was looking for more than a standard, off-the-shelf mobile system. So, we built the HCR app by working in collaboration with our mobile partner CommonTime, utilising a mobile application platform called mDesign. The mDesign platform has been pivotal to the HCR app project that allows us to build sophisticated applications quickly and responsively to the Trust's needs."

"We saw the patient administration system – the system that records all patient encounters with the hospital as the spine of the record that everything else would work with." explains Kybert. "So, the first element when it came to data integration was to harvest the information from our patient administration system and bring it into our database. This was then linked to the clinical outcomes data and correspondence that related to those encounters. We were then able to build on this to add diagnostic information and test results for pathology and radiology resulting in a seamless way to access the information for all clinical areas. Finally, we integrated the GP record to give clinical teams access to current medication, allergies, and current and previous diagnoses."

The idea behind the solution is to consolidate a variety of different information sources into the one application. It can provide a single view of the patient's medical history, so that when they present at A&E, or an outpatient clinic, or are admitted to award the clinician has the all of the information about that person's medical history available within the application.

Throughout the process of building the mobile HCR app, Hillingdon developers have continued to gain new mobile skills and can now confidently make future developments in-house through the platform. This has placed the Trust in a strong position moving forward to swiftly respond to changing clinical priorities.

"We are already providing mobile access to the Trust's PAS, as well as our discharge system, radiology information system, pathology results, clinical documents, GP information, palliative care records and more, so that information which has been joined together by our integration engine can now be made genuinely useful." said Kybert. "But as we continue to engage clinical staff to steer our informatics projects and to understand where we need to refine our mobile offerings to the frontline, the Trust is now in a stronger position than ever before to achieve this, in a responsive, timely and self-sufficient manner."

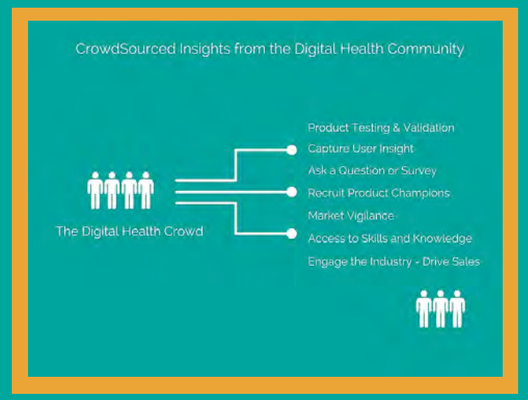
Investing in more than solutions, the in-house capability of Trusts can be a powerful mechanism to meet real clinical needs. ■

Crowd Testing Digital Health

Overview of Services for Organisations

The Digital Health Crowd provides organisations with the tools necessary to effectively incorporate open innovation strategies and leverage the passion from individuals worldwide by enabling participation and co-creation experiences that are both rewarding to users and, at the same time, enhance innovation, testing, evidence and market vigilance capabilities.

The Digital Health Crowd allows us to collectively improve the way that Digital Health solutions are developed, deployed and delivered, by harnessing the shared knowledge, thoughts, ideas and skills of the community.



- Open Innovation
- Crowdsourced Insight
- Crowd Testing
- User Experience Testing
- Digital Champions & Brand Ambassadors

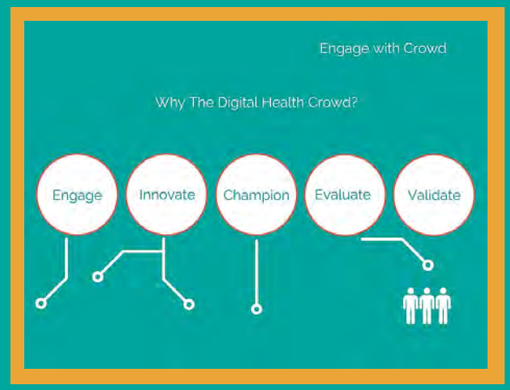
The Digital Health Crowd provides a diverse, on-demand community of testers from across many different healthcare disciplines.

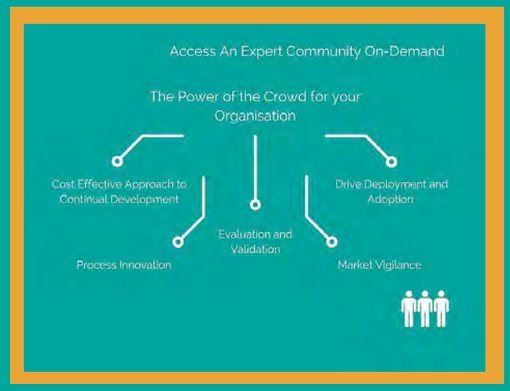
We aim to offer organisations an easy route to scalable industry testing, quality assurance, user experience development, and assessment of clinical workflow integration.

Drive Digital Adoption – Assess Clinical Workflow Integration
Collect Quality Peer Review and Evidence
Build a Network of Digital Champions and Brand Ambassadors

A Crowdsourced Community with a Focus on Digital Health

Cost efficient process tied to your development needs





The Digital Health Crowd helps organisations evaluate, optimise and actively engage with a global community of digital health users and testers. Working with the crowd you can rapidly acquire market advantage and gain critical insights that will drive successful product development and marketing strategies.

The crowd can help deliver a cost effective approach to continual development, process innovation, evaluation and validation.

Use Cases

- Collect expert opinion and reviews
- Iteration testing and pre-market validation
- Build a loyal network of advocates
- Drive adoption and sales
- Find and access specialists with expert skills
- Survey actual digital health users – understand their needs

- Validation – Test solutions are 'fit for purpose' across all classes of potential user
- Manage quality testing and product validation in a scalable environment
- UX testing & review
- Increase discussion within healthcare organisations and across medical specialities
- Build your evidence-base and help support market claims

Branded Digital Health Crowd

We can develop a private, branded Digital Health Crowd from your users and stakeholders. Gain specific insight from your users, understand the needs of your customers, and develop a campaign for continual improvement.

For more information contact enquiries@simedics.org

Mobile Technology: Is the NHS Closing the Skills Gap?

Does the NHS have the digital skills needed to help deliver new models of care? Steve Carvell, head of healthcare at CommonTime, details how some NHS trusts are starting to close the skills gap to meet clinical demands.

New care models, new technology skills

Technology skills are in higher demand than ever. Look across any vertical and developers who can create mission critical apps and push organisations into the mobile era, are highly sought.

NHS trusts tend to only have small teams of developers – but is this enough to cope with the modern and abundant technology needs of the NHS?

For many NHS trusts, IT developers and IM&T teams are focussed on supporting or delivering traditional clinical systems such as electronic patient records and patient administration systems. These large scale IT implementations, targeted at improving digital maturity and the sharing of information at the point of care, demand and consume significant IT resource.

Pioneering trusts are however now finding that achieving an in-house mobile development resource can tackle and respond to emerging frontline clinical priorities, in a rapid and agile manner.

Put simply, the ability to create apps within a hospital is ending a reliance on off-the-shelf solutions and can allow trusts to deliver information to their clinicians and patients, in the way that clinical priorities demand.

A need to focus on mobile skills in the NHS digital plan?

Improving digital skills and digital offerings is at the forefront of many NHS organisation's objectives, and has certainly had buy-in from the top for some time, with progress on the paperless agenda continually being sought.

The UK's former digital champion Martha Lane-Fox outlined in her recommendations to the National Information Board around building the basic digital skills of the NHS workforce. This, she said, was needed to ensure that everyone has the digital skills needed to support people's health needs.

Digital is clearly fundamental to transforming and sustaining healthcare in the UK. NHS vanguards for example, are pioneering care transformation, and at their heart sits the digital sharing of information for better care across populations.

> This goes hand-in-hand with developing digital maturity on the frontline.

But throughout all of this, NHS trusts need to be more agile in their approach to IT to meet today's challenges – both national and local. Building the skills of an NHS workforce that is not only digitally equipped, but that is specifically able to create and share information in a mobile way, could be an answer to this agility.

Mobile first – responding to the real clinical demands

Ensuring mobile in-house skills offers the NHS a way to respond to real clinical demands quickly. Gone are the days when it is acceptable for healthcare professionals to queue for access to a PC terminal to find information on their patient. Whether it is a nurse caring for a patient on end of life care, or a doctor diagnosing an illness, information needs to be at their fingertips, at the point of care, wherever that might be.

Having the ability to create the mobile tools needed to enable this in house can place the NHS in a position of power, and in the position where it can develop tools to fit the needs of its specific staff and patients, no longer constrained to buy generic off the shelf apps.

Large clinical ICT systems have been the priority of NHS organisations. But now there is a very real positive energy in every NHS trust that has seen the benefits of embracing mobile technology. Mobile is not the afterthought it used to be.

Some trusts are now taking a 'mobile first' approach, and with good reason. Smartphones are on the rise in health and are increasingly used by clinicians. In fact, The King's Fund named the smartphone first in its top eight technologies that will change health and care.

Many have shown the enthusiasm for what mobile can achieve for their staff and their patients – but equally as many haven't had the skills needed at the onset of this approach. To fulfil the potential of mobile technology, the average NHS trust needs more resource than the current average of one or two developers per organisation.

Utilising existing clinical skills

There is a wealth of skill and resource that could now be maximised. Healthcare apps require clinical input to be successful. Some clinicians are using their own devices within the hospital to help deliver care.

This passion and enthusiasm to use technology for improving care should not be stifled. Clinical staff can drive app development, without impacting on the demands of a busy hospital ICT team.

Leicestershire Partnership NHS Trust is one great example of this – where a consultant psychiatrist has worked with the Leicestershire Health Informatics Service to create a first of its kind app to break stigma around electro-convulsive therapy (ECT), a potentially life-saving treatment for patients suffering from conditions including severe depression.

The app, which was the first to be created by the trust, was developed without a dedicated mobile development team resource, by drawing on a platform that allowed staff to be quickly trained to use drag and drop facilities. It signalled the start of a new programme of mobile activity in Leicestershire and could have implications organisations throughout the NHS.

Building a skills base

Put simply, trusts need to look at ways at building digital skills, when they do not have capacity or additional resource.

The Hillingdon Hospitals NHS Foundation Trust is another that has done this, using mobile development to overcome integration challenges and creating an electronic care record in mobile form.

The Hillingdon Care Record app has been a major success and is transforming how healthcare professionals access information. Developers too have continued to gain new mobile skills and can now confidently make future developments in-house through the platform.

This has placed the trust in a strong position moving forward to swiftly respond to changing clinical priorities.

Thinking differently

Steeped in history the NHS could be called a technology laggard in many respects. It does however have a wealth of new talent, armed with ideas, from all disciplines including IT. The Five Year Forward View is teaching us to think differently about how we deliver care. There are digital tools available that can help better utilise, or build a digital skills base, but ultimately it's about being flexible and able to respond to the demands of those on the frontline. ■

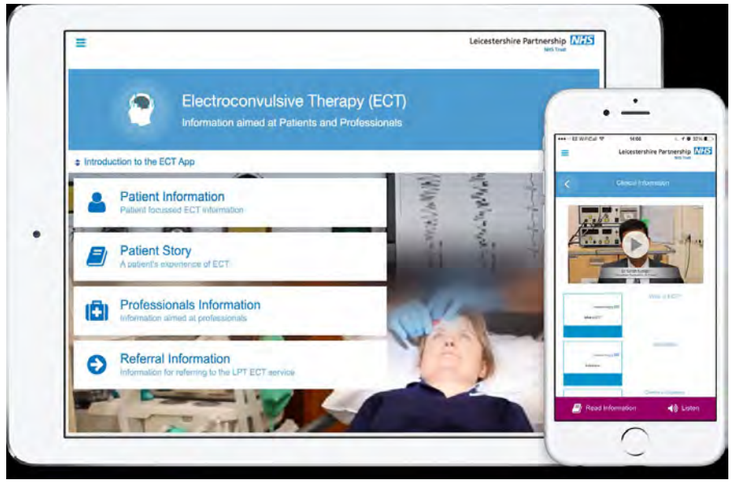
UK NHS Develops First of its Kind App for Mental Health Patients

Thousands suffering from severe depression and other illnesses gain access to new app

Decades of global stigma over electro-convulsive therapy (ECT), a potentially life-saving treatment that helps thousands of patients with illnesses like severe depression, could soon be overcome as a result of a first of its kind mobile app developed within the UK NHS.

The ECT tool is believed to be the first ever mobile app to provide such a detailed, accurate and engaging source of trusted information on ECT and also allows patients to access key contact information for specialists.

The app has now been made freely available on the App Store and Google Play and is the first in a new programme of mobile app development activity for the trust. Dr Girish Kunigiri, Consultant Psychiatrist at Leicestershire Partnership NHS Trust and project clinical lead, said: "Electro-convulsive therapy can be life-saving for patients suffering from severe psychiatric conditions. But despite high success rates in helping patients, stigma still exists.



"The ECT App is the first of its kind in psychiatry and an exemplary use of modern technology to educate patients and clinicians and to break stigma in mental health. For patients and their families, the app describes the whole ECT procedure from preparation to recovery, allowing people to make informed decisions in the consent process. GPs, support workers and other non-psychiatry specialists too can also better understand what this life-saving treatment really means for patients."

ECT has existed for more than 75 years. But despite major advances in procedures, anaesthesia and technology that have seen positive outcomes for as many as 70% of patients suffering from debilitating resistant cases of severe depression, mania and catatonia, the treatment is in decline.

Negative perceptions of ECT that relate

Continued on page 30

Continued from page 29

to treatments from the 1950s are still common, partly because patients who are offered ECT treatment have, until now, been faced with an overload of information in leaflets and from across the internet, with much of this information lacking validity.

The new app now represents a significant step in dispelling myths surrounding ECT, by providing trustworthy information from the trust's ECT centre of excellence, along with real patient stories and high impact videos that feature clinicians and patients and which give detailed guidance on modern procedures. Patients and non-psychiatry specialists alike can also access advice from ECT specialists, with key contact information presented through the app.

The mobile tool is expected to directly help thousands of patients and their families and has also been designed as a highly effective training tool for healthcare professionals.

Developed by clinicians and technologists in partnership with patients, the app was launched at the Royal College of Psychiatrists and has since received national recognition as a finalist in the Patient Experience Network National Awards.

Hundreds of individuals have already downloaded the app within the first weeks of going live. Even though the app was developed in Leicestershire, it can be used by patients across the UK. It has even had a global reception, with downloads reported from Australia and the US. Assistance is also now being offered to other trusts that wish to customise the app.

Philippa, a patient whose story features in the app, has been undergoing ECT since 2009 and credits the treatment with saving her life.

She writes: "In 2006-7 I was diagnosed with depression and put onto medication and, over a period of time, various types of medication that I was prescribed were not successful in treating my depression. This obviously is not always the case and medication is, in many patients a very successful way to treat depression.

"In 2008/9 my psychiatrist discussed with me that ECT is used to treat severe depression in some cases and that I should consider having it. I had no knowledge of ECT, and had not known that it can be used to treat depression and some other mental health conditions. I was quite shocked to be asked to consider it and my family and close friends were very against me embarking on having it due to their lack of knowledge of it. It was something I was willing to try as it had come to the point of wanting to end my life, being close to ending my life which would then end my mental suffering and be free of a life living with depression.

"I undertook my first course of ECT and I know without doubt it helped .Each person is different and for someone course is enough to help the symptoms of depression but for other people and like myself further courses of treatment may be possibly required. The ECT team has always been very understanding, caring, reassuring and kind and that helps enormously when undergoing treatment.

"The side effects for me have, when undertaking the course of treatments, been minimal. A mild headache afterwards, short-lived confusion when coming round from the anaesthetic. The main side effect for me is short-term memory loss, which at times can be frustrating, but the benefits of ECT outweigh the few side effects that may occur.

"ECT is not, in my opinion, a miracle cure and I have had further treatment since the first course of treatment I had, but I know without any doubt that if I had not had ECT I would have committed suicide. It has saved my life and the stigma it carries, the lack of knowledge about it and the opinion of many people that it is barbaric is something, as a patient having had it is something I totally disagree with and feel is unjust.

"If there had been an app when it was first suggested that I consider ECT I would have found it very useful to know everything I needed to know about all aspects of ECT treatment."

Sarah Ost, Service Delivery Manager, at the Leicestershire Health Informatics Service, said: "Through our partnership with CommonTime, we have developed a ground-breaking app of relevance to clinical challenges across the NHS and beyond. Anyone can download the ECT app, but we also now look forward to helping other trusts across the country tailor this application and others, to spread benefits to many more patients and professionals as quickly as possible."

Leicestershire is now in a strong position to develop other mobile applications in response to clinical and business needs and has already created a second app for patients suffering from young onset dementia. ■

A New Breed of Tablet Designed for Healthcare

The RX10H Tablet, from Rugged Mobile Computing Specialist Getac, Built with Healthcare in Mind

As more and more healthcare providers recognise the value of mobilising their clinicians and staff, by providing tools to access clinical data at the point-of-care, the demand for mobile devices specifically designed for hospital environments is increasing.

Until now most healthcare providers have adopted off-the-shelf devices like iPads and other Android tablets when implementing mobile working strategies but as these tools become more ubiquitous across the hospital, and wider healthcare ecosystem, providers are recognising that devices need specialised features that will allow them to meet the specific requirements of the medical workplace.

Designing for healthcare presents its own unique set of challenges. Mobile clinical tablets need to be lightweight and ergonomically designed to allow them to be easily carried during a full shift, they require a level of ruggedness that facilitates easy cleaning and sanitisation, and, most importantly must include the necessary toolset to allow clinicians to easily access, and record, patient and clinical data in real time.

The RX10H, from rugged mobile computing specialist Getac, is one such device that has been developed specifically for use by healthcare professionals.

BUILT FOR HEALTHCARE

With healthcare providers looking to equip clinicians and staff with tablets for use in both hospital environments and within the wider community, Getac have developed the RX10H to withstand the conditions of both clinical and outdoor settings, from its antimicrobial surface to help prevent the spread of infection, to the limitless battery life for full-shift operation the device supports new standards in patient care.

Built to IP65 ingress protection standards, where the "6" stands for total protection against dust, and the "5" for protection against low-pressure water jets from all directions, the device has been built to withstand four-foot drops, shocks, spills, vibration, dust and liquid. It will also operate in temperatures from minus 21 degrees centigrade to plus 55 degrees centigrade. The four-foot drop specification is particularly important as this is the height from which it is expected that a device of this nature is most likely to be dropped, meaning that it should easily withstand frequent falls from a hospital bed.

As tablets are generally used to facilitate the efficient collection of real-time clinical data the RX10H includes both a HD webcam and 8m pixel auto focus rear camera for documentation and teleconsultation, WiFi and Bluetooth for communication, and an RFID reader that can be used for rapid and reliable caregiver and patient identification as well as for the tracking of medication and supplies. There is also an optional integrated 1D/2D barcode scanners for rapid data capture.

INFECTION CONTROL

Infection control is a major issue in health care settings and the use of mobile solutions presents a new challenge for infection control teams - devices need to be easy to clean and sanitise. The RX10H includes an exterior surface material that has been treated to give it antimicrobial properties, preventing the growth of harmful organisms. Getac has also tested the device to ensure that it can withstand the frequent chemical sanitisation that occurs in the healthcare environment. One interesting feature that we noted was that even the screw holes in the back of the tablet have been designed with flush-fitting plugs to prevent residue from accumulating in the holes.

CONTINUOUS POWER

The RX10H comes with Getac's hot-swappable battery technology which means that when a battery is exhausted on the ward, or out in the community, another can be easily inserted without the need to power down. This is made possible by an internal 7.8 watt-hour backup battery that acts as a bridging power source during the change of batteries. Although it is not possible to actually continue working during the battery replacement, this feature freezes any open applications and allows you to quickly resume tasks with very little interruption.

The device uses a slimmed down battery that at less than 10mm in thickness, helps to significantly reduce the overall weight of the tablet. The unit weighs 1.3kg and measures just 18.8mm in thickness. In independent tests the RX10H has been shown to last up to 8 hours (in optimal conditions). In our tests, the device consistently managed over 5 hours of continuous use, with the display brightness up and the wireless permanently on.

Recognising that this device is likely to be one of a number used on a ward, or by particular care teams, Getac also manufacture a multi-device charger unit that provides a central charging station from which all the batteries and devices can be easily managed.

PERFORMANCE

Working with real time clinical data means that point-of-care tablets need to be quick in terms of processing speed. Getac use the Intel Core-M 1.2GHz processor (up to 2.90 Ghz with Intel Turbo Boost Technology) in the RX10H. Core-M was specifically developed for fanless tablets where silent operation, a thin profile, and low weight matter. Part of Intel's 5th generation of Core processors, this is the same processor used in high-end products like the Apple MacBook, Dell's Venue 11 Pro 7000 Series, or Lenovo's Yoga 3 Pro. Designed to conserve energy whilst delivering maximum performance the Core-M chipset easily provides the RX10H with sufficient processing power to undertake any clinical task.

Given that the device has been designed for use by healthcare professionals both indoors and outdoors the 10.1" TFT LCD LumiBond 2.0 display offers full HD and an optimal solution for reading in all light conditions.

The capacitive multi-touch display performed well in review and made getting around in Windows 10 easy and intuitive. When needed the attached stylus proved comfortable and efficient and was definitely useful in certain situations, where greater accuracy was required, like annotation and handwritten note taking. Getac also provide an optional, rugged keyboard that can snap on to the back of the tablet when needed.

WORKS WITH GLOVES

Being a rugged tablet the display also works when wet or with gloves. This is a pretty key element when it comes to healthcare given the number of likely situations where a user will be wearing surgical gloves. The RX10H comes with G-Manager – a solution that allows the user to optimise the experience of individual devices – using the 'Touch' tab users can select different options depending upon whether they are using their finger, wearing a glove or using the input stylus. Upon selection the device adjusts the capacitance to optimise the display for the input choice.

Touch operation and digital ink allow annotations, scribbles, drawings, or even handwriting recognition. In our tests we were surprised by how well the RX10H performed when wearing a surgical glove. Given that this is impossible with standard tablets this feature is a major plus point for the device.

INTUITIVE OPERATION

Understanding the need for rapid access to certain applications, the Getac RX10H includes shortcut function keys, situated on the left of the main display, that rapidly launch tools like the camera, control panel and G-manager. The integrated handle makes it easy to carry the device around, improving fall protection and we expect that features like the integrated barcode reader would be extremely useful for supporting medication compliance and tracking processes across the organisation.

Continued on page 34

Continued from page 33

SECURITY

Getac have clearly prioritised security with the RX10H. The platform offers multi-factor authentication that includes password protection, an RFID reader, a fingerprint reader, and a smart card reader. The RX10H is one of the only devices to combine all of these options in one single solution. Two factor authentication can be achieved using RFID, fingerprint capture and smartcard or common access card. Data on the device is secured using encrypted SSDs and advanced military grade file-level software encryption and protection.

CERTIFIED FOR HEALTHCARE

The RX10H version carries IEC 60601-1 certification. IEC 60601 is a standard published by the International Electrotechnical Commission. The standard consists of four parts, with the 60601-1 part addressing general requirements for electrical medical equipment. Additional healthcare certifications include EN/IEC 60950-1 (for IT equipment safety), EN 55011 (radio disturbance), EN 55022 (radio immunity), EN 55024 (electromagnetic interference), ISO 10993 (biological evaluation), and ISO 13485.

OUR OPINION

The Getac RX10H has definitely hit the mark when it comes to providing the necessary point-of-care features that are likely to be demanded more and more by healthcare professionals. The device can easily be integrated into clinical workflows and support wider digital strategies across provider organisations. Features like the ability to operate with gloves and the infection control measures really make this a strong contender for many different hospital departments and community care situations.

Rugged tablets and laptops have already been adopted in many emergency care situations and it is likely that with a product of this nature it will only be a matter of time before we begin to see wider use across other disciplines. One major consideration that providers will need to weigh up is the cost factor. The RX10H is considerably more expensive than an off-the-shelf tablet. However, given how well the unit meets many of the logistical headaches associated with mobile device usage in medical environments the benefits are definitely likely to outweigh the cost implications. ■

Startupbootcamp Digital Health Announces Partnership with Philips

Startupbootcamp Digital Health Berlin, a business accelerator for early stage start-ups, has announced a new partnership with Philips. As a part of this partnership, for the coming three years, Philips will support the program in accelerating 10 high-potential start-up in Digital Health.

Startupbootcamp Digital Health Berlin accelerates start-ups in Digital Health by building an ecosystem of growth, connecting up to ten selected start-up teams with 200+ industry mentors, access to corporate partners, VCs, €15.000 cash and six months free office space, giving start-ups a collaborative and fostering environment to achieve one year of growth in three months.

Start-ups will benefit from the association with Philips as a leading partner in diverse health markets. One of such benefits will be to gain access to Philips' software platforms to build upon.

Philips also welcomes the speed and innovation that the European Startupbootcamp Digital Health accelerator provides with its mix of start-ups, mentors, corporate partners. "As a leader in the HealthTech segment we are supporting promising, innovative start-ups with our knowledge and investments to boost digital health innovation in Germany," says Bernd Laudahn, Managing Director Philips GmbH Market DACH.

The Berlin accelerator team welcomes start-ups in healthcare and health-related technologies with a focus on behaviour change, diagnostics and genomics, big data and analytics, monitoring, fertility & women's health. Philips has proven expertise in these fields and other upcoming streams in Digital Health, and therefore is a very valuable addition to the program.

Juliane Zielonka, Managing Director of Startupbootcamp Digital Health Berlin, sees great opportunities opening up with this partnership. "Digital Health is about implementing smart health technologies for best possible health outcomes and possibly cutting costs. We are proud to have a strong European partner like Philips on board. The company has an impressive proven track record in health related medtech products and services. Philips adds deep insights in consumer health & lifestyle products as well as unique knowledge on how to bring a product to market globally. Start-ups benefit from these unique industry insights during our accelerator program by being faster in their development cycles through this competitive advantage. "

As a part of its global initiatives, the Digital Health Berlin program cooperates with the US based German Accelerator Life Sciences (GALS), a growth acceleration program for German life sciences companies and an initiative by the German Federal Ministry for Economic Affairs and Energy. It will help the Digital Health Berlin to connect with start-ups in Boston, and lends a wider scope to program's reach and opens up new opportunities for the 2016 class of the accelerator.

The accelerator program is also supported by Arvato CRM Healthcare Solutions, Sanofi in Germany, Deutsche Apotheker- und Ärztebank (apoBank) & Munich Health, making it a valuable partner for early-stage start-ups to accelerate with. ■

startupbootcamp Digital Health

Systematic review of IBD smartphone apps for symptom monitoring and communication with healthcare professionals

McCombie, A, PhD, Department of Medicine, University of Otago, Dunedin, New Zealand
Langlotz, T, PhD, Department of Information Science, University of Otago, Dunedin, New Zealand
Barclay, M, MD, FRACP, Department of Medicine, University of Otago, Christchurch, New Zealand
Walmsley, MD, FRCP, FRACP, Waitemata District Health Board, Auckland, New Zealand
Regenbrecht, H, PhD, Department of Information Science, University of Otago, Dunedin, New Zealand
Schultz, M, MD, PhD, FRACP, Department of Medicine, University of Otago, Dunedin, New Zealand

Acknowledgements:
Dr Andrew McCombie is a recipient of the New Zealand Society of Gastroenterology Janssen Research Fellowship
The guthealthnetwork (www.guthealthnetwork.com) financially supported the work

ABSTRACT

Background

Crohn's disease and ulcerative colitis, collectively called inflammatory bowel disease, have fluctuating and unpredictable disease courses. The prescheduled nature of outpatient appointments often leads to unnecessary outpatient appointments and the inability of a patient in a stage of active disease to get an appointment with their specialist promptly. Symptom monitoring smartphone apps have the potential to overcome this problem through allowing the patient to communicate their symptoms to their specialists remotely, regularly, and when needed. This paper aimed to systematically review all apps available for inflammatory bowel disease symptom monitoring and communication and do a brief analysis of their quality. It was hypothesised that some such apps will exist but they will not have been validated.

Methods

The iTunes and Google Play app stores were searched (using the terms Crohn's disease, ulcerative colitis, and inflammatory bowel disease) for inflammatory bowel disease symptom monitoring apps and were analysed in terms of their ratings in the app stores, and whether they had medical professional involvement in their development. Apps had to record at least two symptoms (i.e. bowel motion frequency and pain) and have a mechanism by which the patient and healthcare professional can communicate electronically.

Results

17 relevant apps were uncovered out of 233 that were screened. Four apps had an average rating of four or more. No apps were peer reviewed in clinical studies, one used a validated symptom index, and only four had obvious medical professional and/or pharmaceutical input into their development.

Conclusions

Whilst many apps exist for inflammatory bowel disease, their effectiveness for improving patient outcomes in a clinical setting needs further testing. Moreover, integration with a faecal calprotectin app will further enhance this as a method of monitoring because having an objective marker of disease is also pertinent for clinical decision making.

INTRODUCTION

Inflammatory bowel disease (IBD), which includes Crohn's disease (CD) and ulcerative colitis (UC), is characterised by fluctuating disease severity.[1] Due to the commonly unpredictable nature of IBD, there is a need for patients to have good accessibility to healthcare professionals (HCPs) such as gastroenterologists and IBD Nurses. Moreover, there can be long periods of disease remission wherein contact between patient and HCP is less important. In saying that, symptom, blood and drug level monitoring remains important, even during remission. However, the reality is contact between HCP and patient is often prescheduled, except in cases of disease flare, which may lead to unnecessary outpatient appointments as well as high needs patients not being seen as often as needed. On a background of increasing IBD incidence globally,[2] increased use of endoscopy,[3] more need for drug monitoring,[4] and the anticipated growing demand for services of gastroentologists,[5] optimization of outpatient services becomes especially pertinent.

Fortunately, modern day telecommunication has provided a potentially revolutionary tool in outpatient management both generally and in IBD. Patients and HCPs can now communicate when not in close physical proximity to each other; this is called "telemedicine". Telemedicine, defined as "medicine practiced at a distance,"[6] can occur via phone, Skype, email, and other means of telecommunication. Telemedicine has been used with some success for IBD although more studies are needed.[7]

Moreover, technology has provided a means by which patients can monitor the symptoms of and even self-manage their disease using electronic devices. Arguably the most useful electronic devices for such tasks are modern day smartphones because they are generally carried by the users at all times. A recent study found 56% of the world's population owned a smartphone.[8] Indeed a subfield of telemedicine has already emerged called "mHealth," which is defined as the use of mobile phones for practicing medicine and public health.[9] However, it has been reported that more than 90% of health-related apps are low quality[10] and that "although enthusiasm for mHealth is boiling over, the level of evidence does not match the level of excitement."[11] A recent comprehensive systematic review on the use of mHealth analysed 50 trials pertaining to a range of diseases,[12] none of which were IBD. It therefore remains unknown if IBD-related apps follow these trends. A recent systematic review of IBD apps in the iTunes and Google Play stores reported that twelve apps tracked symptoms of some sort but as the review was more focused on self-management properties, it did not investigate whether patients could communicate their symptoms to their HCP via their smartphone.[13]

The aim of this paper is to systematically find all IBD-related smartphone apps which involve symptom monitoring and communication between patient and HCP (including specialist and IBD Nurse) in both the Google Play and iTunes stores. How the apps rate in the Google Play and iTunes stores and whether the apps have been validated in a peer reviewed study will also be investigated. It is hypothesised that there will be many apps pertaining to IBD but few, if any will have been scientifically validated.

METHODS

Inclusion/exclusion criteria

Table 1 outlines the inclusion/exclusion criteria.

Inclusion criteria
In the Google Play and/or iTunes store
Relevance to IBD - mention IBD in description or record symptoms relevant to IBD
Contain symptom monitoring element - minimum requirement of bowel motion frequency and pain recorded
English speaking
Mechanism by which patient and healthcare professional can communicate electronically
Exclusion criteria
Symptoms not recorded or not enough symptoms recorded
Non-English
Apps primarily about diet
No mechanism for communication between patients and healthcare professional.

Search strategy

The iTunes and Google Play app stores were searched for apps meeting the criteria.

iTunes

On 1 and 8 March, 2016, the apps under the terms Crohn's disease, ulcerative colitis, and inflammatory bowel disease were searched in the United States and United Kingdom iTunes Stores.

Google Play

On 1 and 8 March, 2016, the apps under the terms Crohn's disease, ulcerative colitis, and inflammatory bowel disease were searched in the Google Play Store.

Data Extraction

The online description of the app was used to extract the price ($USD or $NZD), rating out of 5 (and number of raters), seller/developer, whether or not medical professionals were involved in the development, symptoms recorded, how data could be communicated to physician from patient, and other noteworthy features. When sufficient information could not be gathered by the description of the app, the missing information was gathered by contacting the developer and/or downloading the app and trialling it.

RESULTS

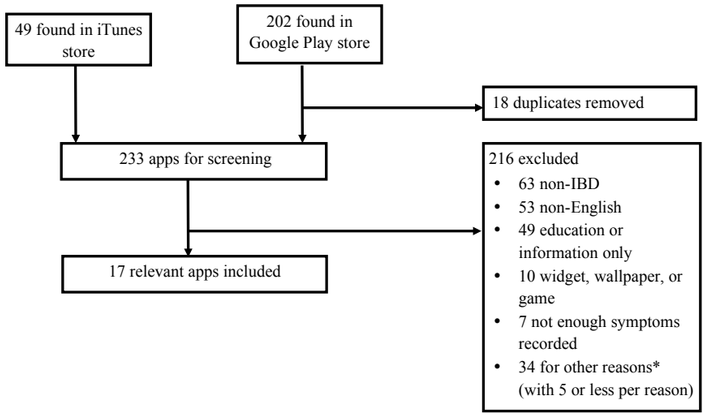
Figure 1 shows how many apps were initially found and ultimately included for this review. In the iTunes stores, the search items (Crohn's disease, ulcerative colitis, inflammatory bowel disease) identified 49 apps after duplicates (i.e. apps that appeared under more than one search term) were removed (Crohn's disease; n = 49, ulcerative colitis; n = 24, and inflammatory bowel disease; n = 19). In the Google Play store, 202 apps were identified, after duplicates were removed (Crohn's disease; n = 107, ulcerative colitis; n = 76, and inflammatory bowel disease; n = 163). After 18 apps that appeared in both app stores were accounted for, 233 separate apps were found under the search terms. Of these, 17 met the inclusion criteria. The majority of exclusions (outlined in Figure 1) were for the app not being related to IBD (e.g., about other diseases), being non-English, and being educational only with no possibility to monitor symptoms.

Table 2 lists the apps that were included for review. Sixteen were available in the Google Play store, eight were available in the iTunes store, and seven were available in both stores. In accordance with our inclusion criteria, all apps recorded bowel motion frequency and pain as a minimum. Four apps had customizable symptom scores (i.e. patients could enter any symptom). Only one app used validated clinical indices (Gut Check™ which used the Crohn's Disease Activity Index and Mayo Score). Regarding communication between patient and HCP, eleven apps used email as the method of communication, two mentioned being able to produce excel spreadsheets which could be attached to an email, and four were non-specific in how communication would happen between the patient and their HCP. Some extra features on offer in the apps are also shown in Table 1.

Continued on page 38

Continued from page 37

Four iTunes and two Google Play store apps did not have ratings available. The app with the most ratings in both app stores was "GI Monitor" (687 in US iTunes and 980 in Google Play); the ratings averaged 3.5 and 3.9 out of 5 in the iTunes and Google Play stores, respectively. The highest rated app from either store was "POOP HAPPENED" in the Google Play store which averaged 4.4 from eight reviews. Other apps to average 4 or better were "Crohn's Assistant," "CDHF Gi Bodyguard" (from the Canadian Digestive Health Foundation) and "Crohn's Disease manager 2."



*other reasons include: 5 calculator only; 2 calprotectin only; 4 colonoscopy prep; 4 food or diet focused; 1 fundraising; 1 medication reminder app; 2 networking apps; 1 not enough information available; 3 not for patients; 5 not symptom monitor; 3 restroom or hospital finder; 3 no communication between doctor and patient

Figure 1: Symptom monitoring apps included.

Five apps in the iTunes store, eight apps in the Google Play store, and nine apps overall were free. Of the non-free apps, prices ranged from $1.19NZ to $6.43NZ. The Colitis Diary was the joint most expensive app in the Google Play Store at $6.43NZ to purchase; Crohn's diary, made by the same maker, was the other app which cost $6.43NZ to purchase. The most commonly rated app, namely "GI Monitor," was free and one of the four apps that had an average rating of four or more was also free, namely "CDHF Gi Bodyguard."

Four of the apps had pharmaceutical and/or HCP input into their development, namely "CDHF Gi BodyGuard," "Crohn's disease manager 2," "Gut CheckTM," and "KCH-IBD" (from Kings College Hospital in London, UK). The only one of these to not be free was "Crohn's disease manager 2."

DISCUSSION

This review aimed to assess IBD symptom monitoring apps that patients could use to communicate symptoms with their HCPs; their quality was assessed via their ratings in the app stores. There were indeed many apps found in the stores, although only 7.3% of apps produced in the searches met the criteria. The most commonly reviewed and rated app was "GI Monitor" which averaged 3.5 and 3.9 out of 5 in the iTunes and Google Play stores, respectively. Four of the apps had an average rating of four or more: "POOP HAPPENED," "Crohn's Assistant," "CDHF Gi Bodyguard," and "Crohn's Disease manager 2."

However, none of the apps meeting the criteria had been tested in any trials regarding feasibility, usability, or enhanced communication between patient and HCP. Moreover, only four of the apps had obvious pharmaceutical and/or HCP input into their development. Therefore, it is unknown whether these apps are really useful in terms of improving the medical care of the patient.

Limitations, implications and future directions

The method of reviewing the apps, aside from reading the descriptions, was to see what the ratings were in the Google Play and iTunes stores. Whilst this will provide information about whether the user liked using it, it does not show whether it really improves outcomes for patients in terms of quality of life, enhanced communication with medical professionals, or IBD symptoms. Future research should test these outcomes properly using randomised controlled trials as well as more comprehensive measures of app quality, such as the Mobile App Rating Scale which measures "engagement, functionality, aesthetics, and information quality, as well as app subjective quality."[14] With the noted rapid rise in smartphone use worldwide,[8] it is important to know whether IBD patient's wellbeing is being optimized or perhaps even hindered by these devices.

A systematic review reported that trials testing the utility of mHealth apps have commenced in alcohol use, asthma, diabetes, cardiovascular disease, and lifestyle factors such as smoking and weight-loss.[12] The outcomes measured include medication adherence, disease management, patient reported outcomes, and behavioural change. It was reported that ten trials had been finished but only three had results available for viewing.[12] Of the three, two were RCTs and one was a single group open label study. The RCTs reported an alcohol use app failed to decrease alcohol consumption while the other showed utility in the context of obesity. The single group open-label asthma study reported improved adherence to inhaled steroids after use of a smartphone app.

In the context of IBD care, the ideal study will have two groups with one randomized to using the apps to communicate with their HCPs and the other to not having access to the apps. Various outcomes can be measured including reductions in outpatient appointments, healthcare costs, hospitalizations, IBD symptoms or IBD flares, as well as increases in quality of life and medication adherence.

Apps may also be useful for post-surgical care as well. One study of post-operative breast reconstruction patients and orthopaedic surgery patients reported high satisfaction among patients; breast reconstruction patients reported satisfaction of 3.9 and orthopedic patients reported satisfaction of 3.7 on a scale of 1 (poor) to 4 (excellent).[15] In addition, the three surgeons would all consider dropping outpatient appointments for certain patients and instead be willing to send personalised electronic feedback to the patients who were progressing well post-surgery. It is plausible similar care could be utilised after resection, colectomy, or ileal pouch construction in IBD patients.

Continued on page 40

Table 2: Symptom monitoring apps for IBD

Name of app	iTunes store? (price*)	iTunes store rating out of 5 (number of reviews)*	Google Play store? (price*)	Google Play store rating out of 5 (number of reviews)*	Seller or Developer (and email address)	Medical professional involvement in development mentioned in description?	Symptoms recorded?	Nature of electronic communication with healthcare professionals?	Other noteworthy features
GI Monitor	Yes (free)	US: 3.5 (687) UK: 3.5 (124)	Yes (free)	3.9 (980)	Medivo (help@medivo.com)	No	Bowel motions, pain level, and weight.	Users can print out or email reports to their doctor.	Stress level recorded, questions for doctor.
My Crohn's diary	No	N/A	Yes ($1.23NZ)	2.5 (6)	3 ACORN Technologies (support@3ACORNTechnologies.com)	No	The user can store any type of symptom (i.e. custom).	Report may be generated and sent by email.	Monitor food, fluid and pain medication intake.
Crohn's diary	Yes ($6.49USD)	US and UK: Information not available.	Yes ($6.43NZ)	3.0 (1)	cellHigh (info@cellhigh.com)	No	Pain, bowel motions, fatigue, fever, and others.	Can email reports, including graphical attachments, to doctor.	Tracks triggers (e.g., food, stress) and keeps a track of health records (e.g. surgeries, procedures, etc.).
Gi BodyGuard from the CDHF (Google) or CDHF Gi BodyGuard (iTunes)	Yes (free)	US: 4 (13) UK: Information not available	Yes (free)	4.2 (14)	Canadian Digestive Health Foundation (cdhfapps@gmail.com)	Yes	Pain, bowel motions, and other symptoms.	A report can be attached to an email to the healthcare team.	Medications, exercise, weight, and food and drink.
Colitis Diary	Yes ($4.99USD)	US and UK: Information not available.	Yes ($6.43NZ)	1.0 (1)	cellHigh (info@cellhigh.com)	No	Includes pain and bowel motion frequency.	Emails reports, including graphical attachments, to the doctor.	Attempts to link triggers, such as food, stress, location, weather etc. with disease activity.
Crohn's Disease manager 2	No	N/A	Yes ($3.26NZ)	4.1 (13)	Julia Bechmann (app.bechmann@gmail.com)	Yes	Includes stool frequency, stomach-ache, and other symptoms.	All data may be exported via email.	Also produces diagrams and records doctors, drugs, and medical history.
GI Buddy	No	N/A	Yes (free)	3.2 (84)	Crohn's and Colitis Foundation of America (info@ccfa.org)	No	Bowel motions, abdominal pain, and other symptoms.	Information can be shared with healthcare team (via email).	Treatment, diet, and lifestyle diaries. Access to CCFA conversations.
IBD Assistant	No	N/A	Yes (free)	3.7 (3)	Leber Laszio (stylerhun@gmail.com)	No	The user can store any type of symptom (i.e. custom).	Can export symptoms and meals to CSV format and then attach them into e-mail in an e-mail application.	Store blood tests, symptom graphs, medications names and doses, meal diary, last colonoscopy, etc.
Crohn's Assistant	No	N/A	Yes ($1.76NZ)	4.2 (6)	Leber Laszio (stylerhun@gmail.com)	No	The user can store any type of symptom (i.e. custom).	Can export symptoms and meals to CSV format and then attach them into e-mail in an e-mail application	Store blood tests, symptom graphs, medications names and doses, meal diary, last colonoscopy, etc.
POOP HAPPENED	No	N/A	Yes ($1.19NZ)	4.4 (8)	Health and Fitness Logs (patricia@poophappened.org)	No	Bowel motion frequency, consistency, blood, and mucus as well as pain.	Can be shared via email, dropbox, Bluetooth, and social networking.	Can produce charts about symptoms and can store notes and photos.
My Symptom Tracker Diary	No	N/A	Yes (free)	2.8 (14)	Anmina Applications (anminaapplications@gmail.com)	No	Symptoms can be customized to the individual.	Can send symptoms via email.	View symptoms over time in a graph
MedDiary	No	N/A	Yes ($1.26NZ)	3.0 (2)	MedDiary, Inc (contact@meddiary.com)	No	Records symptoms (including abdominal pain) and bowel motions.	Can send to healthcare providers.	Also records food & nutrition, medications, measurements, physical activity, and sleep.
CrohnsTracker Pro	No	N/A	Yes ($3.91NZ)	No rating given.	ToTheHand, LLC (CrohnsTracker@tothehand.com)	No	Includes pain and diarrhoea as symptoms.	Emails can be sent to doctor.	Tracks symptoms and triggers.
Poop Happened Lite	No	N/A	Yes (free)	3.7 (15)	Health and Fitness Logs (patricia@poophappened.org)	No	Bowel motion frequency, consistency, blood, and mucus as well as pain.	Can be shared via email.	Can produce charts about symptoms and can store notes and photos.
Gut Check™ for people with IBD by Janssen Biotech, Inc.	Yes (free)	US and UK: Information not available	Yes (free)**	2.9 (13)	Janssen Biotech, Inc.	Yes; pharmaceutical company.	CDAI and Mayo Score, as well as general wellbeing, abdominal pain, frequency, rectal bleeding, and stool consistency.	Shares data with the doctor automatically.	Bathroom finder, tips on diet and nutrition, and calendar that syncs with phone for appointments.
Wellness Widget	Yes (free)	US: 3 (84) Not in UK store	No	N/A	Heartbeat Digital	No	Bowel motion frequency, abdominal pain, fatigue, and overall feeling.	Unspecified; can send general "wellness reports" to the doctor.	Can set email and text message reminders for doctor's visits, medication doses, or prescription refills
KCH-IBD (KCH IBD in GooglePlay store)	Yes (free)	US and UK: Information not available.	Yes (free)	No rating given	Apppli	Yes; made for a hospital's gastroenterology department.	"How well controlled," pain and bowel motions mentioned.	Securely submits health questionnaires to the department before visits.	Can directly call staff members at the hospital, schedule reminders for appointments, and keep records of blood test instructions.

*Reviews and prices obtained 6 April 2016.

** Gut Check™ was not found under any of the search terms but was in the Google Play Store nonetheless.

Continued from page 38

Of the apps that were included in this review, only one used validated clinical indices; Gut Check™ used the Crohn's Disease Activity Index and Mayo Score. Other measures that could be used by apps are the simple clinical colitis activity index (SCCAI)[16] or Harvey-Bradshaw index (HBI).[17] The advantage with these measures is they generally cover all symptoms experienced by the IBD patient as well as providing a "cut-off" where a patient is considered to have clinically active disease. Some apps only covered bowel motion frequency and pain but there are other aspects to consider in IBD symptoms that are covered in the SCCAI and HBI, such as blood in stool and extraintestinal manifestations.

Overall, the ideal app should utilise validated clinical indices and enable electronic communication between patient and HCP. It should encourage users via electronic reminders (called "push notifications") to complete their SCCAI or HBI on a monthly, quarterly, or biannual basis (depending on the patient) so long term symptom trends can be gauged. The ideal app should also have a mechanism by which patients can report urgently in an electronic manner when their disease is flaring. Indeed, an app of this description, which did not appear in this systematic review because it is in neither app store, has been piloted in New Zealand on 35 patients and was reported to be usable and acceptable to the participants.[18] This study reported that older patients found it harder to learn how to use the app while UC patients were less agreeable than CD patients to the notion that IBDsmart could replace visits to the specialist.

One factor in common among all apps reviewed in this paper were that they were symptom focused. Symptoms, which are somewhat subjective and often do not correspond with intestinal inflammation,[19] do not provide all the information needed to the clinician by themselves; evidence of mucosal healing is important because it increases the likelihood of remission in the longer term and helps prevent intestinal injury.[20-22]

However, given that the gold standard regular endoscopy is highly expensive, invasive, impractical, and has risks, the use of biomarkers are a reasonable compromise for measuring inflammatory activity more objectively. Faecal calprotectin is a stool based biomarker that can be used to predict relapse in IBD.[23, 24] Fittingly, apps already exist that the patients can use to measure their faecal calprotectin levels at home; CalproSmart™[25] and IBDoc®[26, 27] are two examples of such apps. Hence an integration between a symptom monitoring and faecal calprotectin app is highly feasible and preferable over either one alone.

CONCLUSIONS

Whilst there exists some smartphone apps for IBD symptom monitoring which can be used to communicate symptoms to HCPs, these apps have not been tested outside the realm of somewhat subjective app store ratings and reviews. Moreover, these apps do not use validated clinical indices. Future research needs to investigate whether smartphone apps can replace face-to-face outpatient appointments, enhance quality of life, reduce flares, or improve any other outcomes. Until these apps are properly tested, no favourable or unfavourable claim can be made about them. Moreover, a faecal calprotectin app can be integrated with a symptom monitoring app to add an objective aspect to the information provided to the IBD patient's HCPs.

REFERENCES

1. Simon C. Inflammatory Bowel Disease. InnovAiT: The RCGP Journal for Associates in Training. 2008;1(9):615-22.
2. Molodecky NA, Soon IS, Rabi DM, Ghali WA, Ferris M, Chernoff G, et al. Increasing Incidence and Prevalence of the Inflammatory Bowel Diseases With Time, Based on Systematic Review. Gastroenterology. 2012;142(1):46-54.e42.
3. Gimeno-García AZ, Quintero E. Colonoscopy appropriateness: Really needed or a waste of time? World Journal of Gastrointestinal Endoscopy. 2015;7(2):94-101.
4. Yarur AJ, Abreu MT, Deshpande AR, Kerman DH, Sussman DA. Therapeutic drug monitoring in patients with inflammatory bowel disease. World Journal of Gastroenterology : WJG. 2014;20(13):3475-84.
5. Rabin RC. Gastroenterologist Shortage Is Forecast: The New York Times; 2009 [updated 20090109]. Available from: http://www.nytimes.com/2009/01/09/health/research/09gastro.html.
6. Wootton R, Bonnardot L. In what circumstances is telemedicine appropriate in the developing world? JRSM Short Reports. 2010;1(5):37.
7. Aguas Peris M, Del Hoyo J, Bebia P, Faubel R, Barrios A, Bastida G, et al. Telemedicine in Inflammatory Bowel Disease: Opportunities and Approaches. Inflamm Bowel Dis. 2015;21(2):392-9.
8. Digital Buzz. Infographic: 2013 Mobile Growth Statistics | Digital Buzz Blog 2015 [cited 2014 11 April]. Available from: http://www.digitalbuzzblog.com/infographic-2013-mobile-growth-statistics/.
9. Adibi S. Mobile Health: A Technology Road Map: Springer Publishing Company, Incorporated; 2015. 1172 p.
10. Aitken M. Patient Apps for Improved Healthcare: From Novelty to Mainstream: IMS Institute for Healthcare Informatics; 2013. Available from: http://www.imshealth.com/portal/site/imshealth/menuitem.762a961826aad98f53c753c71ad8c22a/?vgnextoid=e0f913850c8b1410VgnVCM10000076192ca2RCRD.
11. Spiegel B. Mobile Health Apps: E-Wave of the Future 2014 [cited 2014 November 14]. Available from: https://m.gastro.org/journals-publications/aga-perspectives/octobernovember2014/mobile-health-apps-ewave-of-the-future.
12. LoPresti M, Abraham M, Appelboom G, Bruyère O, Slomian J, Reginster J-Y, et al. Clinical Trials Using Mobile Health Applications. Pharm Med. 2015;29(1):17-25.
13. Con D, De Cruz P. Mobile Phone Apps for Inflammatory Bowel Disease Self-Management: A Systematic Assessment of Content and Tools. JMIR mHealth uHealth. 2016;4(1):e13.
14. Stoyanov SR, Hides L, Kavanagh DJ, Zelenko O, Tjondronegoro D, Mani M. Mobile App Rating Scale: A New Tool for Assessing the Quality of Health Mobile Apps. JMIR mHealth and uHealth. 2015;3(1):e27.
15. Semple JL, Sharpe S, Murnaghan ML, Theodoropoulos J, Metcalfe KA. Using a Mobile App for Monitoring Post-Operative Quality of Recovery of Patients at Home: A Feasibility Study. JMIR mHealth and uHealth. 2015;3(1):e18.
16. Walmsley RS, Ayres RC, Pounder RE, Allan RN. A simple clinical colitis activity index. Gut. 1998;43(1):29-32.
17. Harvey RF, Bradshaw JM. A simple index of Crohn's disease activity. The Lancet. 1980;315(8167):514-.
18. Regenbrecht H, Langlotz T, Ho C, George M, Gray A, Walmsley R, et al. Field test of a questionnaire-based mobile health reporting system. Proceedings of the 26th Australian Computer-Human Interaction Conference on Designing Futures: the Future of Design; Sydney, New South Wales, Australia. 2686670: ACM; 2014. p. 384-7.
19. Falvey JDMP, Hoskin TB, Meijer BM, Ashcroft AB, Walmsley RMD, Day ASMD, et al. Disease Activity Assessment in IBD: Clinical Indices and Biomarkers Fail to Predict Endoscopic Remission. Inflamm Bowel Dis. 2015;21(4):824-31.
20. Baert F, Moortgat L, Van Assche G, Caenepeel P, Vergauwe P, De Vos M, et al. Mucosal Healing Predicts Sustained Clinical Remission in Patients With Early-Stage Crohn's Disease. Gastroenterology. 2010;138(2):463-8.
21. Pariente B, Cosnes J, Danese S, Sandborn W, Lewin M, Fletcher J, et al. Development of the Crohn's disease digestive damage score, the Lemann score. Inflamm Bowel Dis. 2011;17(6):1415-22.
22. Sandborn W, Rutgeerts P, Reinisch W, Esser D, Wang Y, Lang Y, et al. A post-hoc analysis: Mucosal healing in patients with ulcerative colitis associates with a reduced colectomy risk, high incidence of corticosteroid-free state and corticosteroid-free symptomatic remission.: O-021. Inflamm Bowel Dis. 2011;17 Supplement(1):S6.
23. Mao R, Xiao Y-l, Gao X, Chen B-l, He Y, Yang L, et al. Fecal calprotectin in predicting relapse of inflammatory bowel diseases: A meta-analysis of prospective studies. Inflamm Bowel Dis. 2012;18(10):1894-9.
24. Molander P, Färkkilä M, Ristimäki A, Salminen K, Kemppainen H, Blomster T, et al. Does Fecal Calprotectin Predict Short-Term Relapse After Stopping Tnfα-Blocking Agents In Inflammatory Bowel Disease Patients In Deep Remission? Journal of Crohn's and Colitis. 2015;9(1):33-40.
25. Kofod Vinding K, Elsberg H, Thorkilgaard T, Marker D, Pedersen N, Carlsen K, et al. Faecal calprotectin measurements by IBD patients themselves at home are feasible and provide reliable Results compared to the standard lab method. Journal of Crohn's and Colitis. 2015;9:S62.
26. Reinhard C, Weber J, Niederberger C, Perretta F. Usability study of a smartphone-based patient monitoring system measuring Calprotectin for therapy follow up. 10th Annual Conference of the European Crohn's and Colitis Organisation; February 18-21; Barcelona, Spain: 2015. p. 452.
27. Weber J, Ueberschlag M, Prica M, Kräuchi S, Reinhard C, Jermann T. Validation of a smartphone-based patient monitoring system measuring Calprotectin as the therapy follow-up marker. Annual Conference of the European Crohn's and Colitis Organisation; Barcelona, Spain: 2015. p. 273. ■

PlusGuidance: The Role of Digital in Mental Health

By Akil Benjamin

Since taking prime position on the NHS agenda, the topic of mental health has been catapulted to the forefront of the nation's minds. With special features across the news and television, finally, after many years of avoidance and non-disclosure mental health is being positively assessed and tackled by a variety of different organisations across the country.

In London, it is no different. Many start-ups have taken this opportunity to mark mental health care as an industry ripe for disruption.

As the use of telemedicine continues to be adopted in the UK, the efficacy of its use to provide counselling and behavioural therapy has been proven. A study published in the Lancet: "Therapist-delivered internet psychotherapy for depression in primary care: a randomised controlled trial", Kessler et al, 2009 concludes that this means of counselling, paired with traditional therapy can be used effectively on various forms of clinical issues. Participants in this study were randomised in either receiving traditional physician care or traditional physician care with the addition of cognitive behaviour therapy online. This intervention consisted of 10 sessions each lasting 55 minutes, out of which, 5 of these sessions were expected to be completed prior to a four month follow up. The results showed that out of the 113 people who received the online therapy, 38 per cent of them recovered from the depression after four months compared to the 24 per cent who received the control. In addition to this, after 8 months, the level of benefit maintained was shown to be 42 and 26 per cent of the online and control group respectively.

In the current era of digital health, these results are not surprising as they could be hypothesised by any researcher or scientist. Who wouldn't feel more comfortable speaking about their personal issues in an area of their choosing rather than a psychiatrist's office? But, without disregarding traditional therapy sessions this study provides validation and premise supporting the clinical existence of digital solutions that can improve rather than detract from existing methods. This is something which is echoed by many existing counsellors and psychiatrists using digital mediums as they invite both new and existing clients to experience sessions online as well as in-person, depending on an individual's therapy agreement.

PlusGuidance is one solution provider looking to become a contender to lead in this market. Founded by Nathaniel Smithies, who has successfully battled mental health challenges of his own and with a background in psychology and digital marketing, he took it upon himself to tackle this issue, starting a company which uses digital means to reduce the barriers inhibiting people from gaining access to therapy. Over a two-year period, PlusGuidance has experienced rapid growth. With over 1000 multidisci-

Continued on page 42

Continued from page 41

plinary and speciality counsellors around the world, PlusGuidance has had thousands of consultations on their platform helping hundreds of people. Through PlusGuidance, Smithies is achieving his goal of changing the world of therapy by providing the general population with immediate access to mental health care whenever and wherever they need it.

PlusGuidance is not alone in this digital health space. Providing access to mental health support, start-ups like Breakthrough and Talkspace (in the US), along with Babylon Health and Ieso (in the UK) are all trying to command market share with their offerings. But despite this PlusGuidance has managed to pave its way in this market by having a competitive advantage through the means of providing their users with the choice of therapist, time and location.

Education, choice and privacy are three major components to PlusGuidance's offering. With a plethora of curated content on their website about a range of psychological conditions to educate users on a multitude of conditions as well as a variety of counsellors, PlusGuidance also facilitates users to be completely anonymous in their counselling sessions if they chose to be.

"Poor mental health is a proxy for poor quality of life" says Smithies.

A large number of PlusGuidance's consultations occur with females aged 20-35 and males who are aged between 36 to 45. One of the challenges they face is being able to help and provide support for men across all age brackets. Statistics from the Mental Health Foundation show that depression and other mental health conditions have become a silent killer amongst men – 78 per cent of the 6233 suicides recorded in the year of 2013 were of men. This has sparked many social media debates especially during Men's Health Week with the perceived conclusion being, men do not talk about their battles regarding mental health due to the portrayal of looking weak.

With the recent developments of the online therapy, more people are seeing therapists. Charities are spending millions to fight the mental health stigma and the digital health sector as a whole has seen investment from Google Ventures, Rock Health, IBM and many more.

With a leading management team comprising of Nathaniel Smithies as CEO, marketing guru Jon Bishop (experience from the likes of Ebay, Paypal and Funding Circle), software entrepreneur Anton Stoyanov, Mihai Rizea and Emily Sorensen who lead operations and communications, data security veteran Paul Chernett and therapist advisor Dr. Kate Anthony, the PlusGuidance team are set for achieving success.

Recently striking a partnership deal with the number one health app in over 40 countries*, Your.MD, PlusGuidance has partnered with the A.I driven health assistant to be their trusted psychotherapy provider. This deal arose from Your.MD and PlusGuidance sharing the same passion and vision for patient empowerment. As PlusGuidance grows the execution of this deal to potentially serve millions will be one of the company's defining moments as it continues to write its future.

This case study was brought to you by Comuzi in conjunction with Divya Munshi. ■

Study Demonstrates Connected Technology Solutions Dramatically Improve Medication Adherence

96 per cent of chronic disease patients stay on track with daily medication when using connected dispensing technology

The results of a new study have demonstrated that the use of a connected medication dispensing technology can greatly benefit patients with chronic conditions, helping them better comply with long-term therapy. Over the span of one year, user data from more than 1,300 patients in the Netherlands was analysed, showing 96% of patients using Philips Medido, a connected medication dispensing solution, were adherent to their medication schedule. Data from the study also showed that patients using Medido stayed adherent to long-term therapy over time, showing little or no change in adherence over the course of the year.

Successful treatment with prescription medication requires consistent use over time. Studies have shown that during the treatment of chronic illnesses approximately 50% of patients do not adhere to their physician's long-term therapy recommendations[1,2]. While patients rely on their medications to keep them healthy and help them manage chronic conditions, complex medication schedules can often lead to mistakes, such as missed doses, incorrect amounts, or taking medications at the wrong time. Through a connected medication dispensing solution like Medido, patients living with chronic conditions can better manage their medication schedules, resulting in higher medication adherence and reduced costs of care.

Dr Nick Merritt, GP and Partner at Southview Surgery, Bromley mentioned that, "Adherence to medication is a huge concern to GPs in the UK: patients can stop medicines for reasons such as side effects, forgetfulness and pure non-compliance. This can lead to poor control of chronic disease which leads to escalating demand for GP services. There is also a financial cost to wasted medication prescribed and not taken or stockpiled by patients, estimated at up to 300 million pounds annually. We accept some of these are unpreventable but any technology which monitors patients' adherence in "real time" and allows monitoring of medication use can only be of benefit to treating chronic disease and prevent significant wastage within the NHS."

Kimberly O'Loughlin, Senior Vice President and General Manager of Home Monitoring, Philips added, "By providing patients and caregivers with a solution that simplifies this part of the care process, they are able to feel more independent and secure in their care, and feel more confident aging in the comfort of their own homes."

The study looked into 881,000 medication moments of 1,379 patients in the Netherlands who on average took three doses per day. Key data and findings from the study include:

» 96% of patients using Medido had a medication adherence rate over the World Health Organization's (WHO) standard of 80%.
» Patients who required two or more medication doses per day maintained an adherence rate at around 94% with Medido.
» Medication adherence remained consistent over time, with no significant differences during the yearlong study.

In addition to improving medication adherence, connected technology solutions can have a significant economic impact. Earlier study findings conclude that an estimated costs saving of up to 40% per patient could be achieved for specific groups of patients when connected dispensing solutions are part of the patient's regimen[3].

Philips Medido is an innovative home medication dispensing service designed to support chronically ill patients and care providers. When the patient's scheduled medication time arrives, the dispenser automatically reminds them, ensures that

the correct medication is being released at the correct time and then releases and opens individual pouches according to the patient's prescribed regimen. The solution monitors removing medication from the dispenser and remotely alerts nursing staff when medication is not taken from the device, helping to streamline the normally time-consuming task of medication management and allowing them to focus on additional care issues.

Medido is currently available in the Netherlands, with additional launches expected in the U.S. and Europe later this year. For more than 40 years, Philips has been a leader in connected home health solutions with its Lifeline business, helping seniors live more safely and independently. Last year, Philips launched CareSage, a predictive analytics engine that helps care providers remotely manage at-risk patients and predicts whether a patient will need emergency transport in the next 30 days.

References

1. Sabaté E, et al. Adherence to Long-Term Therapies: Evidence for Action. Geneva, Switzerland: World Health Organization 2003.
2. Brown MT, Bussell JK. Medication adherence: WHO cares? Mayo Clinic Proceedings 2011; 86 (4): 304-314.
3. Based on calculations for a patient receiving two combined-care visits and one medication-assistance-only visit a day in the Dutch context. This calculation was not part of the adherence data study. ■

Upcoming Events

5-6 July

Digital Health & Care Congress 2016
London, UK
For more information visit:
www.kingsfund.org.uk/events/digital-health-and-care-congress-2016

25-27 July

HIC 2016
Melbourne, Australia
For more information visit:
www.hisa.org.au/hic/

30 Aug - 1 Sept

Connected Health Summit
San Diego, California, USA
For more information visit:
www.parksassociates.com/events/connected-health/register

14-15 September

Chief Nursing Officer Summit
Dallas, Texas, USA
For more information visit:
www.opalgroup.net/conference/chief-nursing-officer-summit-2016/

22-23 September

Smart Wearable Technologies Summit
Barcelona, Spain
For more information visit:
www.luxatiainternational.com/Events/awearable-technologies-summit/

20-21 October

IoT Tech Expo North America
Santa Clara, California, USA
For more information visit:
www.iottechexpo.com

25-27 October

IoT Planet International Trade Show
Grenoble, France
For more information visit:
www.iot-planet.org

26-28 October

Third European Congress on eCardiology and eHealth
Berlin, Germany
For more information visit:
www.e-cardiohealth.com/

16-17 November

Diabetes Professional Care
London, UK
For more information visit
www.diabetesprofessionalcare.com

Advertisers Index

Cybersecurity in Healthcare Briefing

A new publication from The Journal of mHealth

The essential resource for anyone developing or deploying digital health solutions. Comprising expert advice, knowledge leadership and insight from leading cybersecurity and healthcare data security providers

To subscribe to all 3 issues per year of the Cybersecurity in Healthcare Briefing, please visit www.thejournalofmhealth.com
Also available for individual purchase.