

# The Journal of mHealth

The Global Voice of Digital Health

September / October 2018 | Volume 5 Issue 5

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## Embracing Disruptive Innovation



### FEATURE

Delivering the Benefits of Digital Health



### INTERVIEW

Insight into Mobile Diagnostic Testing



### EXPERT OPINION

Disruptive Technology in Dentistry



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# Welcome



**Disruption is happening across the healthcare market!**

All too often this is a statement that is disputed by industry commentators and analysts when it comes to the discussion of technology in healthcare. Quick to quote problems with fragmentation of care and lack of coordination, lack of a retail market, regulatory barriers and reimbursement the focus is all too often on the issues that still cause problems when it comes to providing solutions to major challenges in the health market.

Admittedly, delivering technology at scale, and particularly on a global scale, does remain problematic and it is for this reason that it won't be any time soon, if at all, that we will see HealthTech giants of the likes of Google, or Facebook. But this is again where the focus of health technology is often wrongly interpreted. Healthcare isn't one industry with one set of particular needs it is an industry of a thousand niches, each with its own set of complex requirements.

The theory of Disruptive Innovation involves turning expensive, complex, inaccessible products and services into simpler and more affordable ones, and as such, healthcare as an industry offers huge potential to introduce technologies that are driven by the need to reduce costs and increase the quality of the provision of health services.

The truth is that having been active in the HealthTech market for the last decade I see countless examples of the ways in which technology is disrupting traditional methods of delivery, across the healthcare industry! In this issue we include a number of articles and features that focus on examples where exactly this is happening.

In an insightful exploration of Disruptive Technology in Dentistry, Dr Aalok Y Shukla discusses how emerging technologies can be used to redesign dentistry to scale globally. Similarly, as the demands on social care systems intensify Dr Jamie Wilson provides an expert perspective on how to make home care a digital therapeutic.

Also inside, we talk to Raji Purewal, an innovation expert at TRUSTECH about what are Disruptive Healthcare Innovations? And, Dr Polwart of Novarum DX to discuss the way Mobile Diagnostic Testing Solutions are changing the Healthcare and Pharmaceutical Industries.

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Published by Simedics Limited  
www.simedics.org

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Design: Jennifer Edwards

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ISSN 2055-270X  
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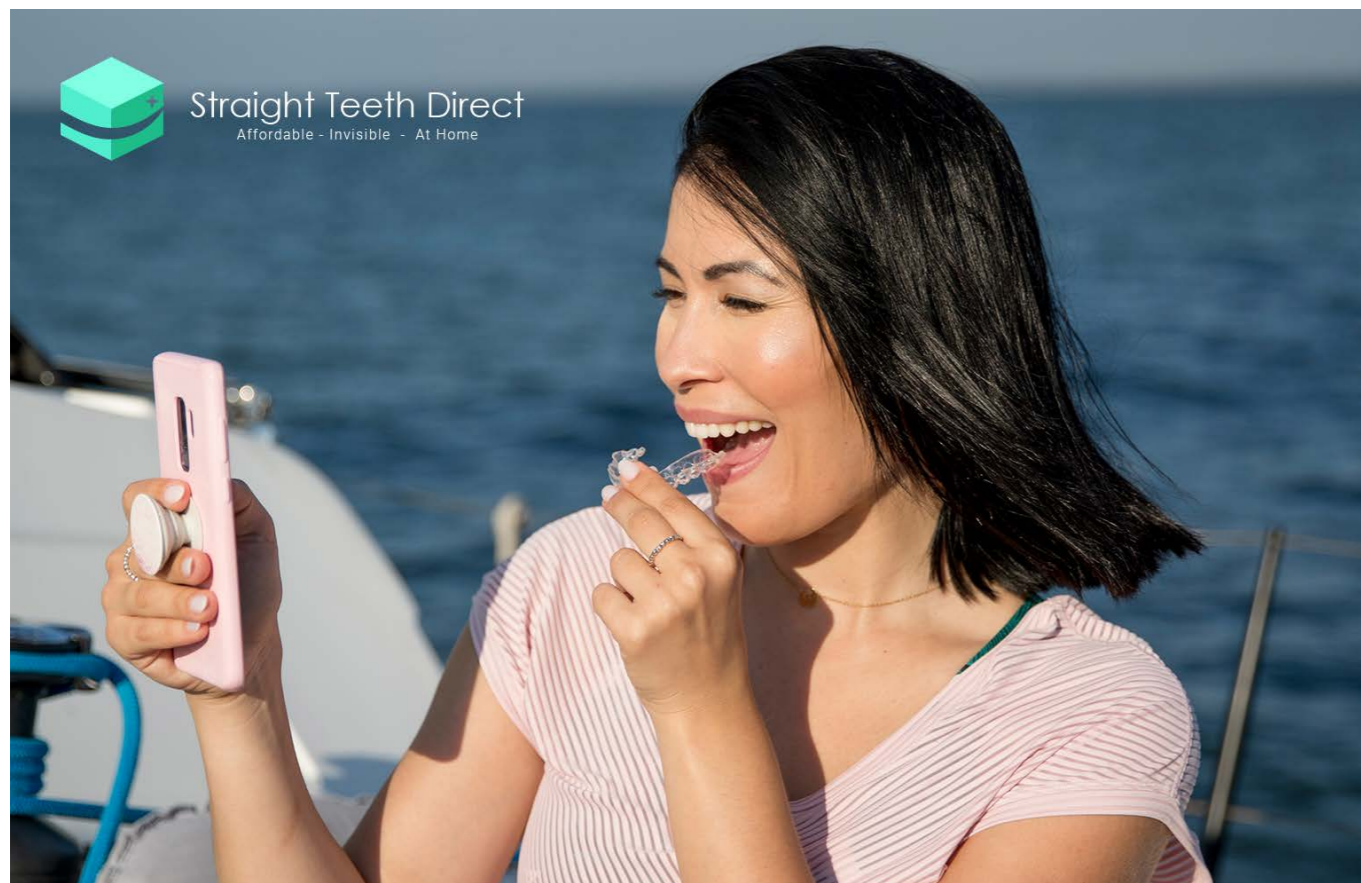
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# Disruptive Technology in Dentistry

## Rethinking the Model



By Dr Aalok Y Shukla

New technologies mean new paradigms are possible. This raises questions:

- » Can a health specialty evolve beyond its previous business model?
- » Can technology redefine and amplify the role of a clinician?
- » Can the incentives be changed in order to create better oral health for more people not just more fee generating procedures?

Yes they can and let's see how emerging technologies can be used to redesign dentistry to scale globally.

In the past dentistry used to comprise of mainly extracting diseased teeth, a painful experience everyone wanted to avoid. Modern dentistry has enabled

people to keep their teeth for longer as there are now many procedures to repair damaged teeth, consisting mainly of fillings, crowns and implants. However this reparative tendency has increased a lot with a large percentage of daily dental treatments consisting of replacing older dentistry. This is known as the restorative staircase - where a filling then gets replaced with a bigger filling, which then turns into the tooth needing a root canal, then the tooth as weakened now needs a crown, then the root canal fails and it needs an extraction, then an implant to replace it, which then fails...

The problem here is that the only way a dental clinic makes money is by doing a new procedure. There is currently no effective business model for prevention (apart from the sales of toothpaste, mouthwash and oral health aids which

can't effectively support the overhead of a clinic). The majority of reduction of tooth decay has been due to the introduction of fluoridated toothpastes from consumer oral health companies, which means the population on masse can brush twice a day and strengthen their tooth enamel. There is a need for a redesign of the system.

Modern Dentistry really has two parts to it:

- » Psychosocial dimension: Feeling happy with your smile - orthodontics, prosthodontics, cosmetic dentistry
- » Health dimension: No disease in the mouth - gum disease, tooth decay, root canals, jaw pain, oral cancer,

Technology can help here in redesigning a solution that scales to the population. The ideal solution will consist of three

elements creating a continuous approach to oral health:

1. Continuous digital monitoring of oral health for early detection of disease - Telemonitoring
2. Preventive, interceptive and reparative at home solutions - Teletreatment
3. In-Clinic minimally invasive reparative, regenerative and enhancing solutions - In clinic treatment

In the future technologies such as computer vision and saliva based diagnostics will help monitor health at home. Remote assessments will become commonplace enabling trends to be spotted and conditions to be caught at the earliest stage before issues develop into more serious and complex problems.

New solutions like nanotechnology based advanced toothpastes and rinses will be developed to help combat tooth decay and gum disease by changing the surface vulnerabilities / properties of teeth, and even repairing / strengthening teeth further, and at home remote-supervised 3D printed custom-made appliance therapy

can straighten teeth and protect teeth from grinding, making orthodontics accessible to all.

Dental disease is not an event it is a gradual process that monitoring and algorithmic prediction can manage.

Everyone will have access to their own records and dental history, and the system will be predictive, helping highlight when it looks like your dental health is deteriorating - so you can take corrective actions to improve your gum health and reduce chances of tooth decay in a more transparent way. This new technological layer which will enable continuous health monitoring and remote treatment, will help change the face of modern dentistry.

Currently in even the most developed countries 50% of people don't go to the dentist, but in the future you won't need to visit a dental clinic to be cared for by a dentist. Dentists will have full lists of digital and physical patients, monitoring and managing them both as they are one and the same, screening the elderly and young from the comfort of their homes,

overseeing regenerative and reparative courses of remote treatment patients are having at home, and then planning and delivering efficient treatments in clinic.

This means people will be able to enjoy better oral health and feel better about their smiles by benefiting from the very latest in dental care irrespective of their proximity to a dental clinic.

### ABOUT THE AUTHOR

Dr Aalok Y Shukla is a healthtech entrepreneur with a clinical background in dentistry. He has a particular focus on artificial intelligence and its clinical applications to deliver a more scalable, data driven approach to digital health services. After running his private practice in London for 7 years, he sold in 2016 and refocused on the unmet demand for accessible, affordable orthodontic care. He co-founded Straight Teeth Direct™ platform & mobile app that offers affordable convenient teleorthodontics to people who would not otherwise be seeking a solution and a new way to work for clinical dentists. [www.straightteethdirect.com](http://www.straightteethdirect.com)

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Dr Aalok Y Shukla  
CEO

# Delivering the Benefits of Digital Health

Without the necessary background and experience, it can be difficult to understand how simple it can be to use powerful digital tools to boost your clinic's performance as a business. Whether you need to update your business processes or you want to learn how to analyse and act upon all the data you have gathered, you often only really need a gentle nudge in the right direction. Here are some top tips we at Medesk would like to share from our experiences over the past decade working in digital health.

## Systematic Approach

### Permit a defined yet individualised patient journey

When you have the whole patient journey planned out in advance with the help of online booking ([www.medesk.co.uk/online-booking/](http://www.medesk.co.uk/online-booking/)), predefined consultation templates ([www.medesk.co.uk/custom\\_templates/](http://www.medesk.co.uk/custom_templates/)) and automatically generated referral letters, prescriptions and invoices, you can be sure that the patient experience will remain fully customisable and yet totally predictable.

### Utilise template-based consultation notes

Taking a standardised approach to recording consultation findings allows you to make sure that you've covered all your bases no matter what the circumstances. Whether you're a general practitioner or a maxillofacial surgeon, the last thing you want is to get bogged down in paperwork when you could be treating patients with the attention they deserve.

### Facilitate continuity of care

Continuity is one of the most crucial aspects of care that is all too often ignored because of time constraints or lack of proper planning. When you take a systematic approach to the care of each patient and use a practice management system with this principle embedded into its very core, continuity of care is easy to plan.

## Actionable Analytics

### Tag your patients, appointments and acquisition channels

Using colour-coded buttons to tag everything that goes on in your clinic, you'll be able to collect a vast amount of action-

able data with next to no effort at all. If you want to understand whether your marketing budget is being spent on the right acquisition channels, coloured tags and labels ([www.medesk.co.uk/tasks/](http://www.medesk.co.uk/tasks/)) are exactly what you need.

### Visual statistics and reports for easy understanding

A picture paints a thousand words and when it comes to getting to grips with your clinic's performance, you'll learn everything you need at a mere glance. Doughnut charts and bar graphs display all your tagged information in an easy-to-understand visual format ([www.medesk.co.uk/management-reporting/](http://www.medesk.co.uk/management-reporting/)).

### Custom reports tailored to fit your precise pain points

If predefined visual reports aren't enough to help you make your key business decisions, you can make your own reports ([www.medesk.co.uk/management-reporting/](http://www.medesk.co.uk/management-reporting/)) based on just about any data you've plugged into systems like Medesk.

## Continuity of Care

### Leverage a comprehensive EHR available to each doctor in your clinic

Stay up to date with the latest changes to your patients' cases when you have access to an electronic health record ([www.medesk.co.uk/electronic-health-records/](http://www.medesk.co.uk/electronic-health-records/)) that ties the whole healthcare journey into one single page. Read up on past medical history, check uploaded files and scans, and give your patients the care they expect.

### Coordinate directly with labs and referral partners

Leverage your professional network and

get your fellow doctors to refer patients by booking them directly into your schedule ([www.medesk.co.uk/schedule/](http://www.medesk.co.uk/schedule/)). Transparency at this level is what turns potential new patients into definite ones.

### Set specific tasks for all kinds of colleagues

Whether you want your secretary to book follow-ups or you need the practice nurse to draw some bloods once you're finished with your next patient, setting a task ([www.medesk.co.uk/tasks/](http://www.medesk.co.uk/tasks/)) that pops up on their screen is the most efficient way to get your point across.

## Telehealth Transformation

### Let external doctors refer patients to you directly

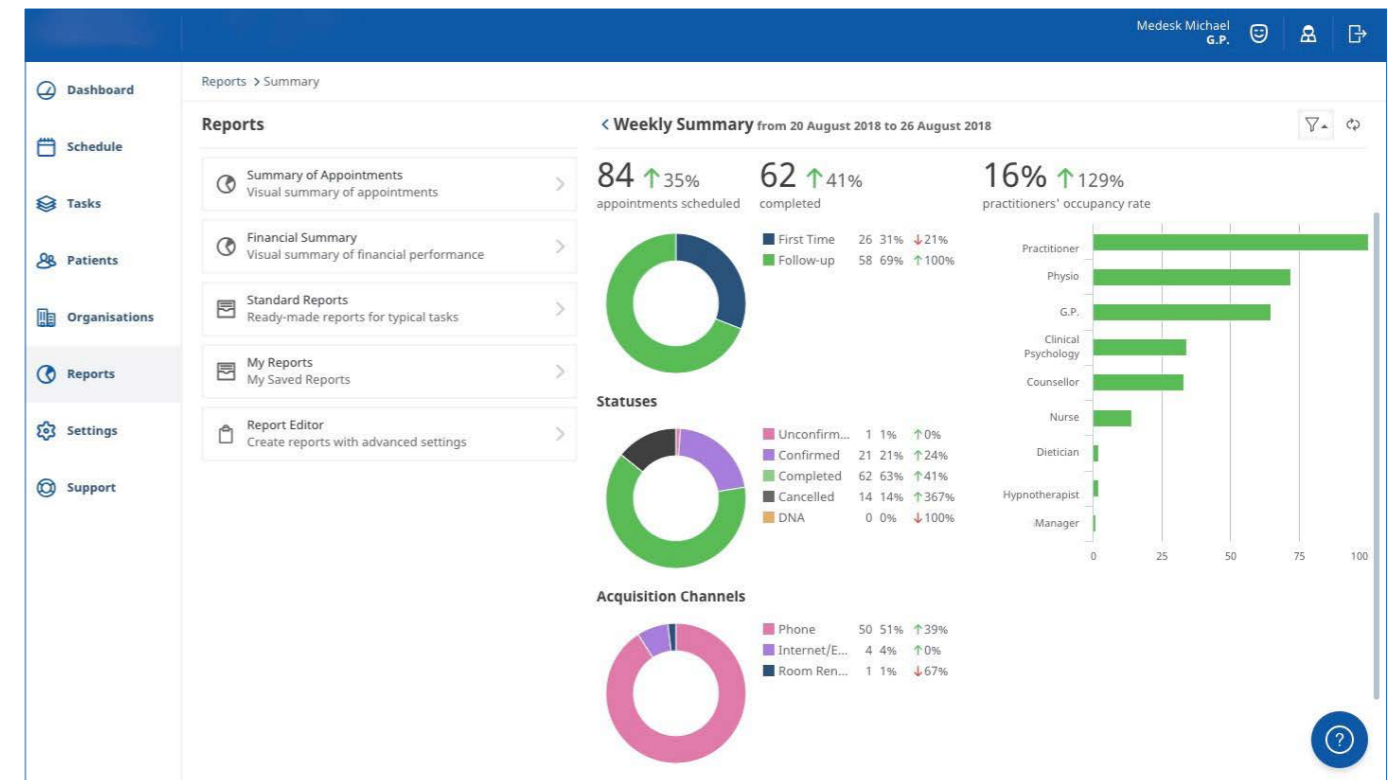
Giving a unique trackable web link to help other clinics book their patients in with you is a great way to maintain and grow your professional network. Plus, you'll know exactly who to thank when your patient list grows like never before.

### Link a patient portal for document requests, advice and appointment booking

By permitting your patients to get in touch with direct requests about documents, appointments and care plans, you're putting their health in their own hands, ultimately making your work easier and more effective in one fell swoop.

### Record phone consultations and improve your quality of care

It's easy to help your receptionists get the most out of phone conversations with patients when you can record them and later review them together. Your patients are sure to thank you for your efforts.



## Boost Patient Engagement

### Develop a better rapport with the time saved by templates

When you're able to drastically reduce the time spent scribbling down your findings or tapping away at the keyboard, you can revert your full focus back to your patients, ensuring they tell everyone they know about your practice.

### Facilitate patient-centred care with a dedicated patient portal

Helping patients to help themselves is a key part of any healthcare service that's worth its salt. Providing them with a dedicated area on your website via which they can request all sorts of information and support is a simple way to boost patient engagement.

### Offer transparent appointment booking with live time slot availability

Since up to 50% of attempted appointment bookings are made out of hours, it only makes sense to give your patients a way to book when you can't take their call. The holy grail is to offer a fully integrated booking system ([www.medesk.co.uk/online-booking/](http://www.medesk.co.uk/online-booking/)) that plugs right into your schedule in real-time.

## Resource Management

### Tag every event as you go along for painless data collection

Gathering usable data doesn't have to be painful when you reduce it down to clicking a few buttons every time a particular event takes place. You'd be surprised at how quickly you can start to act upon your findings.

### Discover which patient acquisition channels are most popular

If you track your acquisition channels by asking each patient how they found out about you, you'll know when it's time to boost advertising funding or to cut your losses.

### Match capacity to demand with scheduling and workload percentages

Examine workload percentages and work out whom to give your patients when their favourite doctor is fully booked. That way, everyone gets to keep their work-life balance just right.

## Improvement & Learning

### Free and continuous training to ensure no one gets left behind

When you're using a comprehensive prac-

tice management system for the first time, some staff members are bound to be a little slower on the uptake than others. We make sure no-one gets left behind at any point.

### Frequent feature development of new features and polishing of old ones

Our development philosophy is such that we grow as you grow. In other words, as you come to need new and improved features to run your clinic, we get stuck in and start developing them for you.

### The more feedback you give, the more solutions Medesk provides

We actively seek constructive criticism from our users as we sincerely believe that this is the only real way to learn and improve as a team and as a service. If there's something we don't offer that you think we should implement, all you have to do is give us a call or drop us a line in the live chat. [www.medesk.md](http://www.medesk.md)



# HOW MOBILE DIAGNOSTIC TESTING SOLUTIONS ARE CHANGING THE HEALTHCARE AND PHARMACEUTICAL INDUSTRIES



Novarum™ DX Founder and BBI Group Head of Mobile, Dr Polwart, has over a decade of experience in the delivery of next-generation diagnostic technologies in mHealth. Here he discusses the impact that these solutions are having upon the healthcare and pharmaceutical industries.

## 1 How are mobile diagnostic testing solutions changing the healthcare and pharmaceutical industries?

It's clear that mobile phone technology has caused widespread disruption and healthcare is not immune. Powerful processing functionality, magnified by unparalleled connectivity, is characteristic of today's mobile phone and this has caused a paradigm shift from traditional methods towards more decentralised healthcare.

Pharmaceutical companies are beginning to recognise that the adoption of mobile-enabled healthcare is inevitable. Digital healthcare drives consumer behaviour to purchase 'over-the-counter' products, repeat prescriptions and even participate in a video-call to seek medical advice. Pharmaceutical companies are now recognising that this millennial behaviour is now the norm and companies that have yet to consider an mHealth strategy, are at risk of being left behind in the marketplace.

## 2 What are the most significant benefits of the Novarum™ DX mobile test reader system?

Our patented image-capture technology transforms a smartphone into an accurate diagnostic test reader. Augmenting camera functionality available on smartphones and providing an intuitive mobile app interface, has uniquely positioned Novarum to revolutionise point of care testing (POCT).

Smartphone diagnostic readers can accurately scan and record the results from a wide range of rapid diagnostic tests. Test results are accurate, available quickly and can be shared securely with healthcare professionals via a portal online. Unusually, our technology also operates without a network connection so can easily be deployed in the most remote locations.

The smartphone offers a number of benefits from a remote testing environment - which utilises mobile networks to bypass poor infrastructure and provide quick, qualitative or quantitative results - in less processing time than laboratory intervention and all without requiring any new hardware.

The technology empowers patients to manage chronic conditions from the comfort of their own home. The ability for patients to perform regular self-testing and have remote access to medical advice is a significant benefit for patients who are too sick to travel, or are located some distance from healthcare support. This enables clinicians to get access to much more frequent testing which should help them to understand disease progression.

## 3 What have been the key technological steps in the development of the Novarum DX solution?

We began with one clear technical mission - to read a lateral flow test with just a phone. We didn't want to use any additional hardware and our core patent, which has now been granted in most of our key markets, is about correcting for the inevitable errors people introduce when they make measurements without the test and camera being perfectly aligned.

We solved that problem early on, but have continued to make significant enhancements to the technology platform we use which enables us to rapidly adapt the technology to most test geometries and virtually eliminate the possibility of the technology misfiring. We invested heavily in getting this new generation of reader technology to work fast enough, that not only could we achieve those benefits, but we could capture multiple image frames in the time it would normally take to record one photograph. Combining these multiple frames helps to reduce errors and provides confidence in the measurement.

We now build on top of this technology to develop customised apps that guide the user through the entire test workflow, a process we describe as test choreography. The technique ensures not only an accurate test result, but also that each step along the way was completed correctly and the results were recorded against the correct patient identifier. This approach adds to our overall objective of removing errors from diagnostic testing.

## 4 How do you ensure that the solution can consistently provide lab-quality results?

Each app is designed and built around the marketing claims that the test manufacturer is making. We build the apps with stringent quality and regulatory assurance (QRA) standards under ISO 13485:2016 and using a software lifecycle that meets IEC 62304. We undertake extensive software verification exercises at Novarum and this positions our customers to focus on validating the technical performance with bench tests

and end-user studies rather than worrying about 'behind the scenes' technical details.

When diagnostic testing requires complex steps, accurate timing or other sources of error, Novarum's test choreography approach can help inexperienced users to achieve the same levels of consistency as experienced end users.

## 5 What do you consider to be the most promising opportunities for your technology?

We perceive remote testing as one of the most promising opportunities for smartphone diagnostic readers. The ability to perform a diagnostic test in resource-poor or rural settings can overcome geographical barriers and support at risk groups who do not have access to regular healthcare.

In particular, smartphone diagnostic testing offers huge potential to help diagnose, monitor and track the spread of an infectious disease outbreak with the supply of real-time information from the source of contagion. For instance, our technology could enable early diagnosis of an Ebola, Zika or Norovirus outbreak and limit its spread, without time lost to conventional laboratory testing methods.

The same principles can be applied to what we call 'at home' or bedside testing. Patients who are either too sick to travel for treatment or require regular testing are empowered to manage chronic conditions from home whilst having access to treatment plans and advice via their GP, at the touch of a button. Moving simple diagnostics out of the laboratory has long been an objective of the industry but has been impeded by the ability to get that data back to the appropriate clinician and recording systems as well as the reassurance that the test has been performed correctly.

## 6 What are some of the challenges when working with new clients to integrate their diagnostic tests with the Novarum DX reader technology?

The challenge is to actually dispel common misconceptions surrounding smartphone diagnostic readers within the areas of test accuracy, data security and how mobile medical apps are regulated. Addressing these concerns has been our focus of late.

Like most pioneering solutions, there is a reluctance to change because 'we've always done it that way'. However, we have a number of customers who have embraced the disruptive nature of smartphone-enabled POCT, become early adopters of mHealth strategies and this positions them ahead of the competition.

Often our clients have little software experience and supporting them on the journey of developing mobile applications is a key priority for us, particularly when our development work is done and the customer is ready to launch their app on the respective Google™ or Apple Store™. At first glance, this can appear an onerous process, understandably, many of our customers are unaware of the steps involved. Helping customers understand these timescales, designing apps which make it through those approval processes and offering guidance on how to navigate the intricacies of an app store is a key part of our customer success management approach.



## 7 What benefits does the ability to deploy end-to-end mobile diagnostic testing functions give to your clients'?

Smartphone functionality provides opportunities to introduce video instructions, image carousels and built-in timers to facilitate self-testing correctly and this forms part of our test choreography approach as explained earlier.

It's important to recognise from our perspective, however, that the solution offered by Novarum is not simply confined to a mobile medical app.

We establish a mobile eco-system. There are many benefits to operating the end user portal which include the recording and interpretation of test data for trend analysis, condition monitoring, batch traceability (in the event of a test recall) and tagging test results with geo-filters to record infectious disease outbreaks with coordinates, time and date stamps.

## 8 How do you see the company developing in the next 5 years?

Novarum is leading the way in mobile health diagnostics. It's incredible the pace of change in the mobile sector and predicting the future is notoriously difficult. There is no doubt though that mHealth is growing fast and diagnostics will be part of that. We're growing at nearly 100% year on year both in turnover and headcount. I can see that trend continuing for a number of years so Novarum will become an ever more important part of the diagnostics community in the future. In fact, with some of the exciting opportunities we are just starting to work with it's quite likely that if you don't have a Novarum developed app on your phone in the next five years, then someone else testing your clinical samples will. Increasingly we will see the democratisation of healthcare and likely a transformation towards patients accessing and even carrying their health records securely on their own mobile device. Mobile phone technology may begin to undergo some major revolutions in that timescale too and Novarum should be well positioned to ride these waves as they appear. ■





# Making Home Care a Digital Therapeutic

By Dr Jamie Wilson is a U.K. based dementia specialist and founder/CEO of *hometouch*

We are facing a global care crisis, fuelled by ageing populations, funding deficits for healthcare across many developed markets and what is seen as a rapidly growing ‘dementia epidemic’.

Our partner, UK-based, Alzheimer’s Society estimates 46.8 million people globally are currently living with dementia, and that the numbers affected will double every 20 years, rising to 115.4 million in 2050. To put this into context, the worldwide costs of dementia will soon match the GDP of the US (Currently c \$20tn).

It is wholly unsustainable and medical solutions are few and far between. Drug companies have spent hundreds of billions of dollars on failed compounds to treat the condition. More than 400 drug trials have failed since 2000 with a 99.6% failure rate. In fact, only one new drug, memantine,

has been approved during this time.

Here in the UK, the government is paying lip service to tackling the issues without a great deal of action. All the while, carers and their patients are facing increasingly difficult working and living conditions.

Our care systems are being underfunded but more fundamentally that that, they are flawed by design. Again, here in the UK, a ‘time and task’ model of care provision is sparking a recruitment and retention crisis, which fails to take advantage of technology to improve patient outcomes and cut costs in parallel.

We need to fundamentally reform how care is provided, with a new approach that takes a preventative role, using technological advancements to make more of the funding that does exist. This will require a shift in mindset and that will not happen overnight, but it is crucial if we’re going to improve care today and halt the progress of this crisis which is already on our doorstep.

## Brain health and the opportunity for prevention

In the midst of many challenges facing our social care system today, the cognitive health of the elderly is a primary concern, not only people working in care, but for our policy makers too.

There are 850,000 people in the UK that are diagnosed with dementia, and 30% of people currently know someone suffering with the condition. Any disease brings emotional challenges that far outweigh financial burdens but in the case of dementia, paying for care is a serious concern, which is estimated to cost £100k on average.

What we fail to acknowledge is that there are ways to delay the early onset of dementia and if we act now, we could radically reduce its burden on our society. According to research in the *Lancet*, 40% of dementia is preventable with structured lifestyle interventions.

Changes to diet, physical activity and mental stimulation could halt the progress of cognitive decline in its tracks, and these interventions can be delivered through home care itself.

However, at the moment, many carers are not trained to identify, or manage the symptoms of dementia and the current system means that too many carers are being treated more like contract cleaners than the care professionals they are.

In short, we are missing an opportunity to take a preventative approach, one which is affordable, delivered by care workers but one which will fundamentally be supported by technology.

## Making better use of technology

From monitoring tools for those living alone, to care robots that can replace some functions of a human carer and help combat loneliness, and assistive technology that can support in areas from maintaining a regular sleep pattern to automating elements of cleaning, gardening and cooking, there is huge scope for technology to make care more efficient and support people to live an independent lifestyle for longer.

Some of these advancements will be controversial, many will not

become common place for many years, but even today technology offers us the perfect entry point for a new, preventative approach to cognitive decline.

Through platforms like *hometouch*, which are digitising the logistics, compliance and quality assurance of home care, we’re already collecting vast amounts of data on the downstream effects on dementia. Combined with the powerful algorithms we’re developing which match stratified patient groups with the hundreds of lifestyle interventions for cognitive impairment, empirically validated each year in clinical studies, we are reimagining the way home care is being delivered.

By empowering carers with digital tools we are able to track activity, behaviour and safety, meaning the impact of interventions on clients can be monitored and understood over time. This can provide us with crucial insights, gleaned from natural language processing to predict problems before they arise, and deliver information to fuel a more proactive and preventative model.

These technological advancements release carers from administrative and cumbersome tasks that currently fill their time, allowing them to focus on areas where the human touch can make the most difference but it can also help them progress and develop professionally.

My company, *hometouch*, is developing new tools and learning materials to enable carers to help patients maintain brain health. We are the first and only home care platform to focus on prevention in this way and we believe this should be available for all carers treating

patients with dementia and would be a means to help reduce the burden on the healthcare system.

In reality, technology can and should be good for patients and carers alike: providing an always-on support system for those who need it, while uplifting the role of caregivers to the point where the job regains the meaning and purpose that should be its core attraction in the first place.

Through re-organising how care is organised and delivered, focusing on stronger relationships, preventative care and patient empowerment, all allied to technological enhancements, we can create an elderly care system that performs better, costs less and achieves much more. [www.myhometouch.com](http://www.myhometouch.com) ■

*...a new approach that takes a preventative role, using technological advancements to make more of the funding that does exist.*

## DON'T MISS

our **Upcoming Events** section on page 25 to find out what's on across the mHealth industry

# INDUSTRY NEWS

News and Information for Digital Health Professionals



## Digitalising Drug Information Results in Time Savings for NHS Clinicians

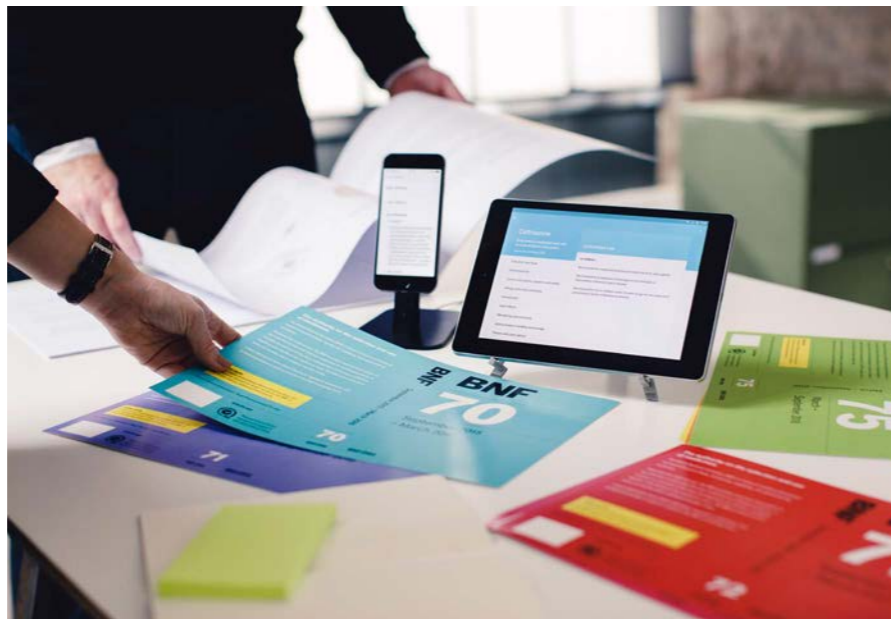
A year on from its launch, a medical app is helping to reduce the time it takes for clinicians to prescribe drugs to patients.

The British National Formulary (BNF) App was introduced in July 2017 and contains comprehensive information about all of the prescription medicines available on the NHS. It includes indications, contraindications, side effects, doses, legal classifications, and prices.

Created by design and innovation consultancy, Modern Human with the BNF, the app's core feature is an interaction checker that helps clinicians ensure the safety of their patients by intuitively checking for possible drug interactions. Over 126,000 clinicians are now using the app each month, checking pages every 6 seconds.

From usage figures, Modern Human estimates the app has been used to prescribe drugs safely to over 10 million patients and save each clinician roughly 15 hours a year or approximately 150,000 hours across the NHS each month.

Until last year, BNF information was only available to clinicians through either hard-copy reference books and static online versions, via the previous NICE app. This left doctors manually checking and cross-checking information – a time-intensive process.



Paul-Jervis Heath, Founder of Modern Human, observed: "We spent significant time in hospitals, on wards, in busy pharmacies and in GP surgeries shadowing clinicians to understand their working practices and needs for drug information. Our aim was to design a solution in partnership with health professionals, so they had a product they wanted, valued and that provided immediate benefit to their interactions with patients."

The result is that health professionals are seeing time savings using the app compared to the paper and static online versions. During its research and test-

ing, Modern Human estimated the time saved by clinicians could be as much as eight minutes per use.

"We've had incredible feedback from across the NHS, with some doctors describing it as 'indispensable,'" says Karen Baxter, BNF Director at the Royal Pharmaceutical Society. "In the wider sense we are helping the NHS towards its ambition of being paper-free by 2020. But really the benefit is to patient care, by allowing front line health professionals to quickly access information supporting the safe use of medicines at the touch of a button." ■

## World's First Hand-held Infrared Devices for COPD & Other Conditions



Glyconics – shaping the future of medical diagnostics

A hand-held device that would give early warning of 'acute events', and so avoid the hospitalisation of thousands of patients with chronic obstructive pulmonary disease (COPD), is to go into production ahead of clinical trials. This follows an agreement between medical diagnostics company Glyconics and Spectrolytic, a leading developer of infrared (IR) spectrometers.

IR spectrometry is proven as a non-invasive technique for diagnosis of a range of conditions including COPD and diabetes, but the current IR technology is too large to be used outside of a hospital.

Cambridge-based start-up Glyconics is the first to miniaturise IR technology to enable a low-cost device suitable for use by healthcare professionals and their patients at home.

Dr Niall Gallen, CTO at Glyconics, says: "Our technology has gained proof of concept and we are now accelerating the development of our device and platform. By entering an exclusive agreement with Spectrolytic we will be able to produce Glyconics devices for testing ready for major clinical trials next year."

Spectrolytic is the world leader in the use of spectroscopy for industrial and food applications; through the agreement with medical diagnostics specialists Glyconics it will produce the world's first hand-held IR devices for COPD and other conditions.

Carsten Giebeler, CEO of Spectrolytic, comments: "Spectro-

lytic was founded with the aim of making spectroscopy solutions more widely available. Glyconics are recognised leaders in spectroscopy for medical areas; this expertise will enable us to produce a low cost device that can be used in the home."

Professor Anoop Chauhan, Director of Research & Innovation at Portsmouth Hospitals NHS Trust, says the initial application for COPD is exciting:

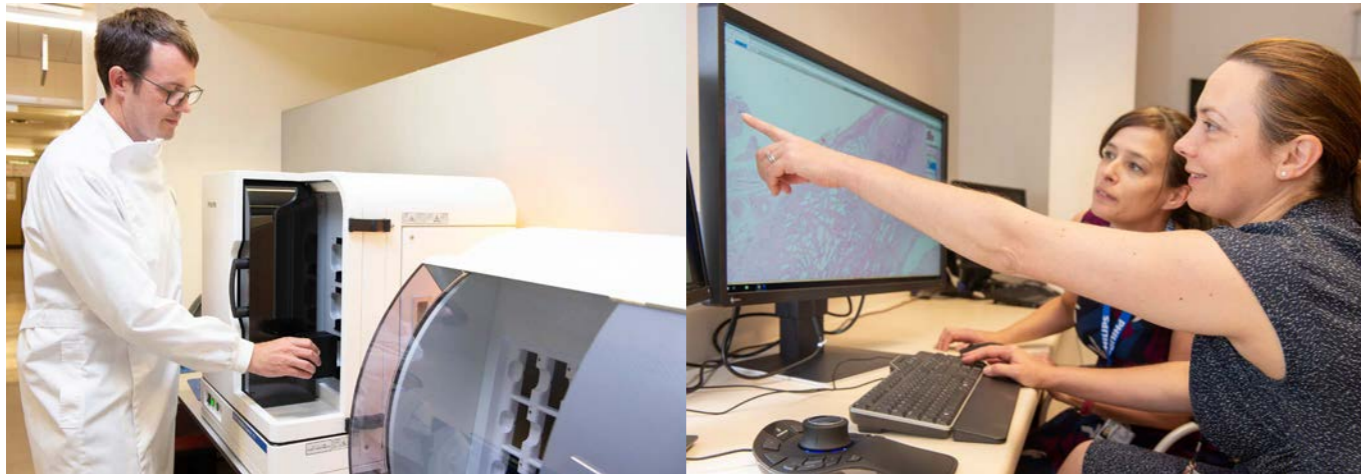
"At the moment, when patients develop an exacerbation, they become very breathless and very wheezy, and as a result they require increased levels of treatment. Some patients have crisis exacerbations and they end up in hospital. These attacks are preventable if treatment is given early but we currently have no technology able to predict them. It is this unmet need that Glyconics is addressing."

Earlier this year the European Commission awarded Glyconics a coveted Seal of Excellence, a quality label awarded to project proposals submitted to Horizon 2020 which succeeded a highly competitive evaluation process by independent experts. This quality label is a guarantee for investors to find high standard project proposals from European SMEs with growth potential. Glyconics was also identified as a 'Top 50 Cambridge Companies: One to Watch' by Business Weekly.

The Glyconics devices will be ready for user trials Q1 2019 ■



# Philips and Oxford University Hospitals NHS Foundation Trust Team Up to Deploy Innovative Digital Pathology Network



Oxford University Hospitals NHS Foundation Trust creates advanced diagnostic network to help improve patient care across Wiltshire, Buckinghamshire and Oxfordshire

Philips and Oxford University Hospitals (OUH) NHS Foundation Trust, have announced plans to create a digital pathology network to help drive faster and more efficient diagnoses for patients. OUH will deploy the Philips IntelliSite Pathology Solution at the John Radcliffe Hospital in Oxford, which will serve as a central laboratory service for partner sites at Milton Keynes University Hospital NHS Foundation Trust and Great Western Hospital NHS Foundation Trust in Swindon.

Pathologists play a critical role in disease detection, particularly with cancer diagnosis. Traditionally, pathologists analyse tissue samples on glass slides under a microscope. When seeking a consultation with a sub-specialist, these glass slides must be transported to the second site, which can result in lost or damaged slides or delays in diagnosis. By creating a digital network, OUH will leverage the Philips IntelliSite Pathology Solution, including its Ultra Fast Scanner and Image Management System, to allow clinicians across the three regions and within the Thames Valley Cancer Network to collaborate remotely on patient cases. This enhanced collaboration will help reduce delays in slide transport times, encourage more efficient workflows across the sites, and enable quicker access to specialist pathology opinions. Digital pathology will also support NHS Improvement's proposed Pathology networks, bringing together clinical expertise with the goal of enhancing patient outcomes.

## Digital pathology will transform microscopy

"As an NHS Global Digital Exemplar committed to improving patient care by embracing the latest digital technologies and

cross-site collaborations, this partnership aims to modernise patient care and offer innovative world-leading services," said Professor Clare Verrill, Honorary Consultant in Cellular Pathology, Oxford University Hospitals. "Initially starting with some specialist areas, we hope to soon make our pathology services fully digital, meaning our laboratory teams can maximise efficiency and focus on analysing samples rather than spending time manually transporting slides between hospitals."

"With 70% of NHS diagnoses requiring a pathology sample<sup>1</sup>, and with sample analysis becoming increasingly sophisticated while demand increases [2], Philips is committed to collaborating to modernise UK pathology services," said Marlon Thompson, General Manager of Philips Digital Pathology Solutions. "Philips wants to help providers meet growing demand by moving pathology from the era of microscopes and fragile stacks of sample slides to one of clinical efficacy with sample images uploaded quickly and analysed robustly within the Philips IntelliSite Pathology Solution. I believe this agreement creates the first digital pathology network with scanning capabilities at multiple sites within the NHS in England, which is a great achievement and a very positive prospect for patients and clinicians alike."

Philips IntelliSite Pathology Solution is an automated digital pathology image creation, viewing and management system comprised of an ultra-fast scanner and image management system. This solution contains advanced software tools to manage the scanning, storage, presentation, reviewing, and sharing of images. Philips IntelliSite Pathology Solution is available in various countries globally for primary diagnostic use. In addition to its CE-IVD clearance in Europe, it was the first – and currently only – digital pathology solution allowed to be marketed for primary diagnostic use in the U.S. since April 2017 and in Japan since December 2017. ➔

Clinical cases will commence once network installation has completed, expected in Q3 2018. For more information, please visit Philips digital pathology.

1. NHS England. 2016. 'The Digital First': Clinical Transformation through Pathology Innovation', available at <https://www.oxford-nhs.uk/wp-content/uploads/2014/02/pathol-dig-first.pdf> (last accessed: June 2018)

2. Cancer Research UK. 2016. 'Testing times to come? An evaluation of Pathology capacity across the UK', available at: [https://www.cancerresearchuk.org/sites/default/files/testing\\_times\\_to\\_come\\_nov\\_16\\_cruk.pdf](https://www.cancerresearchuk.org/sites/default/files/testing_times_to_come_nov_16_cruk.pdf) (last accessed: June 2018) ■

# NHS Hospitals Turn to Deep Learning and Advanced Algorithms to Fight Heart Disease

New technology using deep learning and advanced algorithms to evaluate blood flow to the heart is now being used in English hospitals to fight against coronary heart disease.

Coronary heart disease (CHD) is one of the leading causes of death in the UK. It is responsible for more than 66,000 deaths each year and it is estimated that 2.3 million people in the UK are currently living with the disease<sup>1</sup>. CHD develops when the arteries leading to the heart narrow or become blocked, which can reduce blood flow, and cause chest pain and heart attacks<sup>2</sup>.

The HeartFlow® FFRct Analysis is being supported by NHS England as part of the Innovation and Technology Payment (ITP) programme to help physicians better diagnose coronary heart disease. It provides the highest diagnostic performance compared to other commonly available tests<sup>3</sup> and is able to help physicians identify coronary disease often missed by other tests, while reducing the need for unnecessary tests, such as an invasive diagnostic angiogram<sup>4</sup>. The National Institute for Health and Care Excellence (NICE) estimates HeartFlow can save the NHS approximately £9.1 million per year<sup>5</sup>.

Under the ITP, the HeartFlow Analysis is currently available in 13 hospitals across the country with a view of being rolled out in more than 35 hospitals by the year's end.

Currently, it takes most hospitals several weeks to diagnose and develop a treatment plan for coronary heart disease. HeartFlow may be able to help shorten this timeline.

Using deep learning and state-of-the-art data processing following a coronary computed tomography (CT) scan, the HeartFlow Analysis creates a detailed digital 3D model of the patient's arteries. It then applies advanced algorithms to solve millions of complex equations to assess the impact of any blockages on blood flow to the heart.

People experiencing chest pain should visit their GP or a rapid access chest pain clinic, where a physician can request a CT scan. If needed, a HeartFlow Analysis can be applied to CT scan results for patients.

Professor Tony Young, national clinical lead for innovation, NHS England, said: "To allow exciting innovations to flourish and spread, NHS England has footed the bill for a select group of products, such as the HeartFlow Analysis which could reduce the need for invasive tests, so patients can benefit faster."

"From the very beginning the NHS has been at the forefront of driving innovation. As we look to develop our long-term plan, the NHS will continue to champion world-leading technology."

Dr. Timothy Fairbairn, MBChB, FRCP, Ph.D., consultant cardiologist, Liverpool Heart and Chest Hospital, said: "This technology has exciting benefits for patients, physicians and the NHS. It helps to diagnose coronary heart disease more quickly and more effectively whilst reducing reliance on more invasive procedures. In Liverpool, we have seen how the clinical introduction of the HeartFlow technology is helping improve patient management by reducing waiting times and positively

influencing clinical decision making."

"The national support for the HeartFlow technology shows the NHS' commitment to innovation and implementing new technologies that can help improve the patient experience while delivering the best possible outcomes."

In recognition of its innovative technology, HeartFlow was recently awarded the Advanced Diagnostics, Genomics and Precision Medicine Award by the West Midlands Academic Health Science Network (WMAHSN). The awards were established in 2016 to recognise and celebrate the work of individuals and organisations in developing better healthcare and increasing wealth for local people.

"We are proud to be working with the NHS to make this state-of-the-art technology available in England, to help physicians diagnose and treat one of the leading causes of death in the country," said John H. Stevens, M.D., president and chief executive officer, HeartFlow. "We will be working hard to ensure HeartFlow can help improve the overall patient experience, by both helping physicians identify heart disease which may have otherwise been missed and delivering significant cost benefits to the NHS."

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# Funding Supports Scaling of Portable On-the-Spot Testing Platform

MBio Diagnostics, a company leading a new era in rapid, on-the-spot clinical diagnostics and sample testing, has announced an additional \$6 million in Series B financing led by new and existing investors. The funding supports the refinement of the MBio platform and improvements in manufacturing as the company scales-up to support its commercialisation partners.

The MBio platform brings remarkable simplicity of use and speed to a broad range of test modalities, from protein arrays and nucleic acid detection to cellular analysis. The platform's simplicity is enabled by the MBio LightDeck® technology, which is based on planar waveguides and fluorescent detection, and eliminates the need for sample prep. LightDeck® technology has applications in medical and veterinary diagnostics, food safety testing, and environmental monitoring. MBio's approach is differentiated from other rapid test methods: it is low cost (injection-molded plastic consumables), highly reproducible, and



readily scalable to large volume manufacturing.

"MBio is rapidly becoming the platform of choice for test applications in all

market segments from medical and veterinary to food and environmental," said Chris Myatt, CEO of MBio Diagnostics. "This funding enables growth driven by a portfolio of clinical testing partners." ■

of the arm; it can be scanned with a handheld reader, allowing people with diabetes to track their blood glucose levels without the need for finger-prick blood tests. The Libre has been called a "game changing technology" since it gives people with diabetes much greater control over their condition, reducing the likelihood of serious complications.

Many healthcare professionals were able to see the system for the first time at last year's Diabetes Professional Care show – and visitors will have the opportunity to see it again at DPC2018, where its manufacturer and platinum sponsor Abbott will be on hand to demonstrate the system and answer your questions about its ground-breaking technology.

Abbott is one of several exhibitors showcasing its tech solutions at DPC2018. Other leading companies presenting their diabetes health tech products and services include:

- » GlucoRx, DPC2018 gold sponsor whose products include Nexus and HCT glucometers, and FinePoint insulin pen needles
- » Roche Diabetes Care, DPC2018 gold sponsor with its Accu-Chek range of diabetes care systems
- » Nipro Diagnostics, with its TRUE portfolio of blood glucose monitoring systems

A number of leading experts in digital education and behavioural change will also present their solutions at DPC2018, including OurPath, X-PERT Health and Changing Health.

DPC2018 silver sponsor Changing Health is helping to transform diabetes self-management with its evidence-based behaviour change programme for people with type 2 diabetes, which has so far been adopted by 16 NHS organisations across the UK.

Talking recently about its plans for DPC2018, Changing Health said: "We'll be presenting new data to inspire healthcare providers and commissioners. It will show how personalised support for behaviour change can be highly effective in diabetes prevention and management, helping patients lose weight, lower their

HbA1c and significantly reduce their risk of complications."

Changing Health CEO and Vice President, John Grumitt will deliver a session at the DPC2018 conference entitled 'How to deliver patient self-management and behaviour change at scale – 2017-18 outcome data with key lessons for the NHS'.

The DPC2018 conference will also include a stream dedicated to Diabetes Technologies, with sessions including:

- » Flash glucose monitoring – from clinical practice to real world practice. Dr Ramzi Ajjan, Associate Professor & Consultant in Diabetes & Endocrinology, The Leeds Teaching Hospitals NHS Trust
- » Choosing the right one – the technology toolkit. Lesley Jordan and Melissa Holloway, INPUT Patient Advocacy
- » Immersive learning: virtual, augmented and mixed reality. Arjun Panesar, CEO, Diabetes.co.uk

Also returning to DPC2018, The Edge innovation zone will feature the latest cutting-edge diabetes care solutions from healthcare and tech start-ups. This year's exhibitors include Thermetrix, with its unique device for early detection of foot and leg problems resulting from diabetes.

"DPC has established a reputation for showcasing innovation and leading-edge technology for people with diabetes, and DPC2018 promises to be our most exciting year yet," says Baker.

"The show will provide healthcare professionals with a unique forum for discovering and learning about a gamut of tech products and services, from glucose monitoring and insulin pumps to digital education and behavioural change programmes. They can see these solutions first hand on the exhibition floor, and also learn about their real-world application at our conference and workshop sessions."

For further information on sessions in the Diabetes Technologies stream and the rest of the DPC2018 conference programme, visit the website [www.diabetesprofessionalcare.com/register](http://www.diabetesprofessionalcare.com/register) ■

## Diabetes Tech to be a Key Focus of DPC2018

"The time to be technology laggards is over," says Dr Partha Kar, DPC2018 keynote speaker and National Associate Clinical Director Diabetes, NHS England, in his recent blog post addressing some concerns – and presenting some "factual corrections" – around nationwide access to the FreeStyle Libre flash glucose monitoring system. He concludes by saying "further use of technology, increased self-management, safety in hospitals are all coming fast and sharp" and that the pressure for Libre access is not a one-off, but a "test-run at best".

It is, therefore, essential for healthcare professionals to be well informed and educated on the latest tech developments for diabetes care.

"Technological advances are helping to ease the pain and hassle of managing their condition for people with diabetes, while having the potential to improve their outcomes," says Toby Baker, Event Director, Diabetes Professional Care. "It is therefore increasingly vital that healthcare professionals have knowledge and understanding of current and upcoming health tech, to help them pro-



vide optimum care and support to their patients with diabetes."

The FreeStyle Libre, which was made available on the NHS last November, comprises a tiny glucose sensor worn on the back

## TeleHealth Solutions to Support Growth of VisuWell Telemedicine Platform

TeleHealth Solutions and VisuWell have entered into a partnership which will further accelerate the expansion of VisuWell's telemedicine platform within the healthcare industry.

Atlanta-based TeleHealth Solutions is a vendor-agnostic partner that supports every step involved in planning, implementing and supporting a telehealth system. Headquartered in Nashville and formerly known as WeCounsel, VisuWell modernises today's healthcare provider organisations

through a platform that enables consumer-friendly access, facilitates engagement and extends virtual care delivery to better meet the needs of patients at reduced costs.

VisuWell is experiencing tremendous demand for its SaaS-based telemedicine platform and has enabled more than half a million sessions for healthcare providers to date. Under the terms of the agreement announced today, TeleHealth Solutions will provide implementation services as needed, including project

management, clinical workflow assessment and technology deployment, to VisuWell's rapidly growing base of provider customers.

"We are honored to partner with such an outstanding company as VisuWell and look forward to supporting the company's success," stated Ned Thurman, CEO of TeleHealth Solutions. "Providers within all specialties are increasingly turning to telemedicine to reduce costs and improve patient care. The growth in demand ➔

for VisuWell's platform truly reflects the strength of its technology and satisfied base of healthcare provider customers across multiple specialties."

VisuWell recently announced the completion of a new round of funding, which should further fuel sales growth and market expansion of its telemedicine platform. Investors include Longmeadow Capital of Longmeadow, Mass., and Point Judith Capital of Boston, among other participants.

"We are impressed with the expertise of the TeleHealth Solutions team, which has decades of healthcare experience and specializes in implementing telemedicine systems for healthcare systems and providers. Their in-depth knowledge of clinical workflows will be a tremendous benefit to our customers," said Sam Johnson, CEO of VisuWell.

"We continue to make significant progress toward our goal of bridging the divide between where patients are physically

located and their needed interventions and consults. One such example is the ever-important task of integrating the behavioral community into primary care, emergency and urgent care networks," added Johnson.

VisuWell's telemedicine platform serves specialties, including emergent telepsychiatry, endocrinology, family practice, geriatrics, mental health, OBGYN teleobstetrics, pediatrics, primary care, tele-radiology, sleep telemedicine, telestroke and urgent care telemedicine. ■

mies as well as basic scientific insights in physics that will drive further innovations are possible due to Ram Group's sensors. The impact over the next decade will save lives as well as transform our economy." Commented Dr. Jody Ranck, EVP Global Strategy, Ram Group

The Ram Group's production facilities, located in Germany, will allow custom tailored manufacturing of any sensor/sensing capability with facility expansion set for Singapore and Houston, Texas. Prior to further expansion, the facilities can already enable

the production of 200,000 sensors per day via an atomic engineering process and machinery. The result is the ability of any enterprise to enter the era of quantum sensing from a commercial stand point giving the ability to detect multiple variations of chemical-physical phenomena from one sensor. A range of use cases across the energy, defence and communications industries can be easily produced, however, Ram is exploring their own capabilities across digital health to accomplish novel diagnostics solutions at the point of care with inexpensive smart devices, or wearables for single point monitoring and data analysis. ■

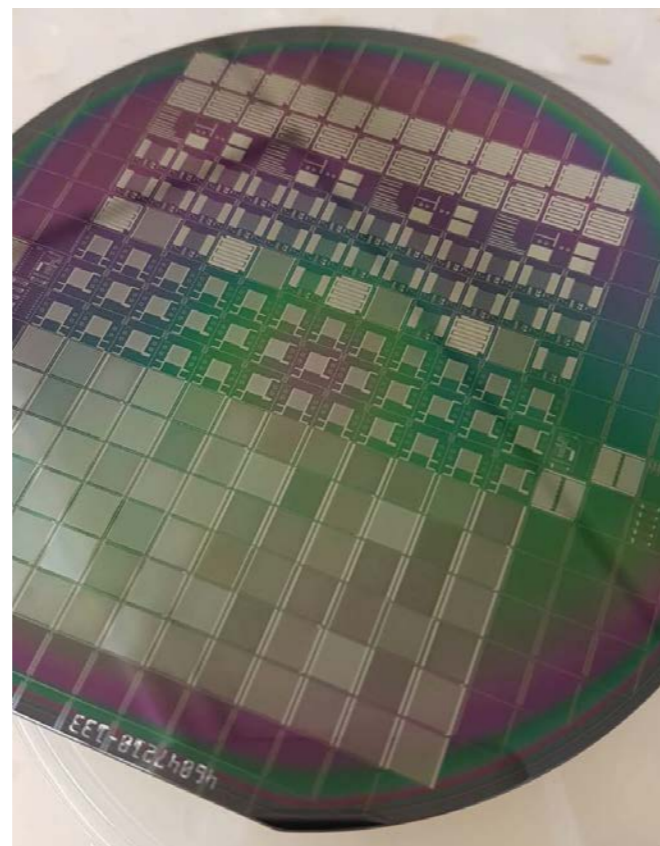
## Quantum Sensing Platform and Production Facilities for the Healthcare Market

The Ram group has announced the launch of their end-to-end platform consisting of quantum sensor technology, R&D labs and global production facilities bringing quantum sensing from a dream of the future to the present reality.

Following 8 years of development and perfecting their quantum sensing technology, the group is opening their post-silicon era solution to any enterprise aiming to bring advanced diagnostics capabilities to the healthcare industry or any IoT innovation across sectors.

Silicon based sensors can currently tell us "what" with regards to physical phenomenon, Quantum sensors are the sensors of "Why" and can analyse exponentially deeper analytics. Ram's sensing platform utilizes GaN (Gallium Nitride) in addition to a set of proprietary materials that create a sensor over one million times more sensitive in signal-to-noise ratio than anything currently in the market, enabling use cases ranging from telehealth for minimally invasive diagnostics and novel wearable devices, to a new range of physical phenomenon sensing IoT devices with powerful data assets. For example, their Home Health sensors include a Single Point Monitoring sensor that tracks continuous blood pressure, EKG with a novel signal, atrial and ventricular pressures, heart rate variability, and temperature without using electrodes and also includes a Smart Urinalysis application that can analyse nutrition, metabolism and allergies, for example. The introduction of the quantum hardware will enable more robust machine learning and artificial intelligence by providing a range and depth of data previously inaccessible.

The Ram Group's sensors can be produced at one tenth the cost of silicon-based chips allowing global development at scale, with the ability to not only detect the smallest quantum particles but also analyse multiple aspects about these particles interactions, providing one sensor that can do the work of several and allowing detection at much lower densities/frequencies. Given



the range of use cases and capabilities, the Ram Group will be opening their worldwide research labs and production facilities to allow manufacturers the ability to have a full solution for the creation, development and production of new quantum sensing devices and wearables.

"Quantum sensors such as Ram Group's have the potential to transform entire industries across healthcare, oil and gas, industry, defence, communications and aerospace. Novel data econo-

## Propeller Health's Digital Medicines Allow Anthem to Better Manage COPD Symptoms

Anthem Blue Cross and Blue Shield in Ohio are to rollout an innovative new program, with Propeller Health's collaboration, to help improve health outcomes for Ohio consumers enrolled in Anthem's Medicare Advantage health plans who have chronic obstructive pulmonary disease (COPD).

Propeller's leading digital medicines for COPD and asthma management consists of small sensors that easily attach to consumers' existing inhalers. The sensors are paired with a mobile app to automatically track medication use and provide personal feedback and insights that help individuals manage and cope with symptoms.

Anthem's care management team will also use Propeller's online provider portal to help understand consumers' progress in managing their COPD, providing more targeted, personalized care and treatment. Consumers need a history of at least one emergency room visit or hospitalization caused by COPD to be eligible for this program.

"There's currently no cure for COPD, but much can be done to help consumers treat the disease," said Linda Hotchkiss, MD, Managing Medical Director, Anthem's Medicare Advantage Central Region. "This collaboration between Anthem and Propeller gives individuals access to connected care technology that will help them more easily manage their COPD, in order to help them have a better quality of life. Anthem will continue to focus on improving consumers' healthcare experi-



ence by increasing access to high-quality, meaningful solutions."

Almost sixteen million Americans suffer from COPD and millions more are unaware they have the disease, according to the Centers for Disease Control and Prevention.

"We're excited to partner with Anthem Blue Cross and Blue Shield in Ohio to bring the benefits of digital medicine to

Anthem's consumers who suffer from COPD," said David Van Sickle, Propeller Co-Founder and CEO. "The insights and feedback from our platform help people suffering from COPD control their symptoms and strengthen the relationship with their care providers."

Anthem's care management team will begin working this summer with providers and eligible consumers to start enrollment. ■

# Italy's First Digital-therapeutics Service for Blood Pressure Management

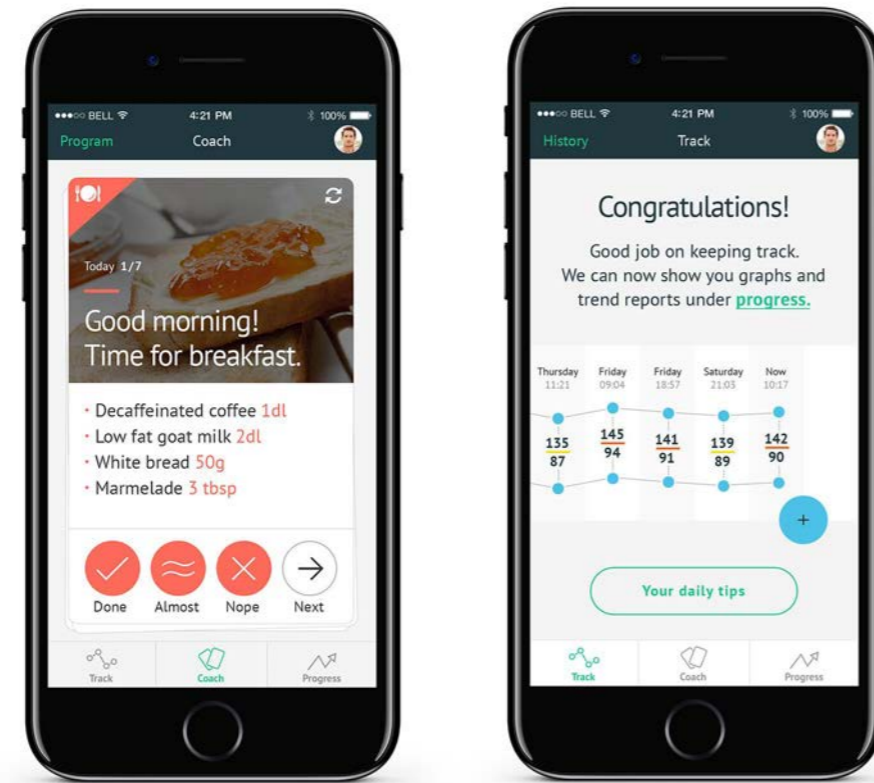
Improving lifestyle habits to help control risks related to hypertension is the goal of the partnership that Generali Welion, Generali Italy's new company for services in the health and Welfare space, is launching with Amicomed.

The partnership will allow Generali Welion to offer its customers a highly scientific and personalised digital service capable of interpreting variations in blood pressure and fighting hypertension, complementing the role of the physician and medication.

The digital program, created by Amicomed in Silicon Valley, with important scientific and technical contributions from the US and Italy, combines innovative analysis of blood pressure trends and fluctuations with personalised insights on how to improve lifestyle habits to help manage blood pressure.

Simple lifestyle changes, without replacing the role of a physician or medication, can help achieve important health improvements in the short and long term. The Amicomed program, which Generali Welion will offer to its customers, encourages and rewards the beneficial behaviours of its users who wish to adopt a healthier lifestyle.

The service is powered by an interpretative algorithm that provides insights on blood pressure variability. This facilitates and complements the role of the physician in making informed care adjustments decisions. Users are also accompanied in their day-to-day decisions by personalised programs including daily nutritional, physical activity and blood pressure measurement recommen-



dations. All accessible simply through their smartphone.

Blood pressure values can be submitted to the service in a variety of ways: automatically through connected devices, imported from the Health App (Apple Healthkit) or even manually.

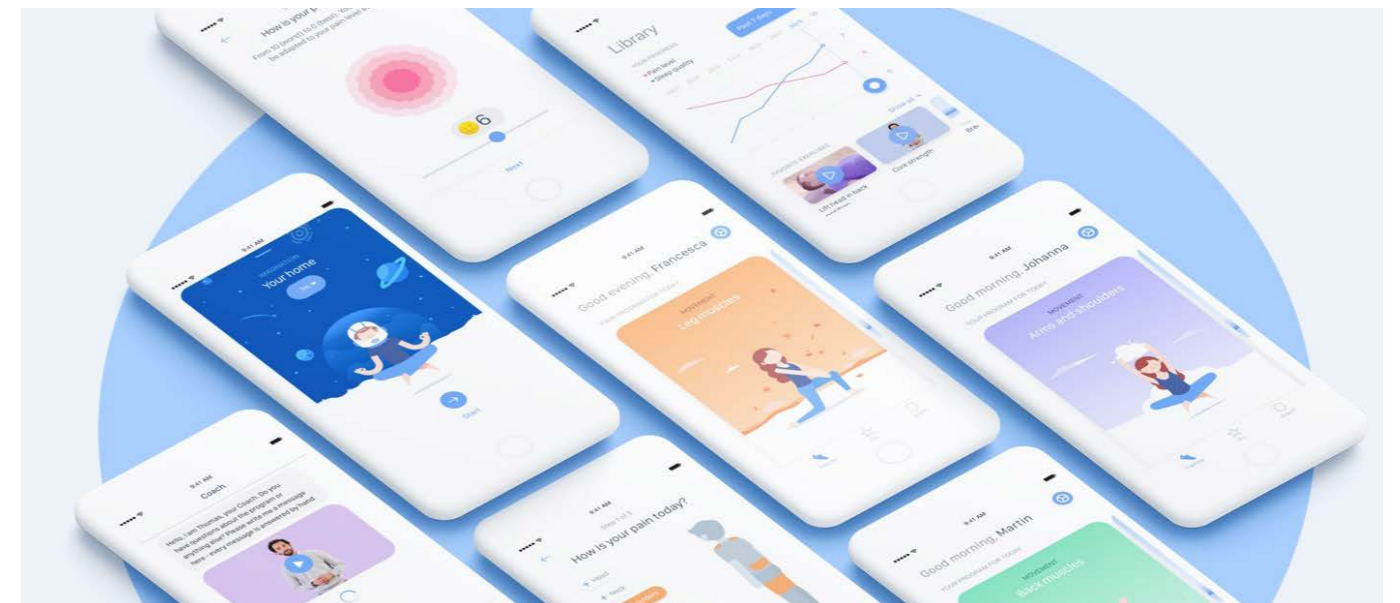
*In the fight against an asymptomatic disease, we act as the symptom*

Andrea Mencattini, CEO of Generali Welion said: "One of Generali Welion's main focuses is the management of healthcare through a capillary network of affiliated providers, with the intention of improving the level of service for customers by supporting the relationship between doctors and patients through

the use of innovative platforms and technologies. Our cooperation with Amicomed originates with the goal of offering the best possible customer experience combined with the most innovative solutions for individual health."

Giangiaco Rocco di Torrepadula, CEO of Amicomed said: "Amicomed has already presented its results at the best scientific congresses in the world, showing an average 5mmHg systolic blood pressure reduction, up to 20 mmHg in the best cases. In the fight against an asymptomatic disease such as hypertension, we act as the symptom. This is how we help people make those small changes, such as going for a brisk walk, which add up to improve their lifestyle. Our algorithms often show improvements after just a couple of days of lifestyle changes, setting off a virtuous cycle in which users start behaving in ways that make them feel better and learn how to manage their lifestyle with greater awareness." ■

# New AI Treatment for Low Back Pain Could Save the UK Billions Each Year



Low back pain (LBP) is an increasingly widespread and expensive condition worldwide, and the World Health Organisation (WHO) has identified back pain as being the global number one reason for disability. According to the Office for National Statistics back pain accounts for almost 31 million days of work lost in 2013 costing the UK economy £14bn a year - but this could now change thanks to an AI app which launches in the UK, and has significantly reduced the pain intensity of LBP by 40% in a recent clinical study.

An estimated one-third of the UK adult population are affected by LBP each year, most of it unexplained, although some professionals think that it may be worsened by sitting at desks all day, carrying bags and general bad posture as well as by environmental factors like stress.

The Kaia app has been developed by a leading digital therapy company Kaia Health in conjunction with physiotherapists, pain management physicians, orthopaedic surgeons and clinical psychologists. The app has been approved as a Class 1 medical product in the EU, and allows users to self-manage their non-specific back pain which is all cases of back pain that do not require specific treatment - and includes up to 90% of all cases of back pain. The app uses a multidisciplinary digital approach that offers users education,

physiotherapy (including exercises for the lower back and lateral muscles) and psychological strategies (including mindfulness and muscle relaxation). The AI tailors treatment programmes for each user from over 120 exercises, and motion tracking technology ensures that the exercises are performed correctly using a smartphone without the need for additional hardware. Each session lasts for 15 minutes, and can be accessed anywhere 24 hours a day. The app also features a chat function which connects users to a physiotherapist or sport scientist for motivation and exercise-related questions.

Recent clinical studies on the Kaia app were conducted at the Department of Neurology, Centre for Interdisciplinary Pain Medicine, Technical University of Munich and the Department of Orthopaedic Surgery, Physical Medicine and Rehabilitation, University of Munich in Germany. Results show a significant reduction in LBP by 40% which is well above the clinically important threshold of pain improvement, whilst the second study shows a 40% long-term retention of users for 6 months with the mean app usage over this period being 3.2 times a week.

The Kaia app was developed in Germany where it has been downloaded over 100,000 times in its first year. Thanks to reimbursement deals with several big insurances in Germany the Kaia app is

now being offered free of charge to over 20 million patients in Germany (over a quarter of its population). Kaia Health is hoping to replicate this same success in the UK where an estimated one-third of the UK adult population are affected by LBP each year.

Kaia Health is member of the Digital Therapeutics Alliance, an association of international manufacturers for digital therapeutic products that meet high quality standards. The company recently launched the Perfect Squat Challenge App, the world's first AI-powered motion tracking fitness app that turns an iPhone into a personal trainer.

Konstantin Mehl, Founder & CEO Kaia Health says: "A holistic, multidisciplinary treatment of LBP using education and exercise has always been an expensive, resource-intensive undertaking which makes it hard to integrate in health systems such as the NHS. By digitising therapy we're democratising access to effective treatment of LBP. This empowers and motivates individuals to take control, and self-manage their condition with evidenced-based, non-pharmacological, cost-effective alternatives that could save the UK economy billions each year. The Kaia app, and advances in technology, demonstrates why we need to rethink how we treat diseases, and make digital self-management a more realistic part of treatment." ■

# Progressiveness, Innovation and Diversity at the UK Health Show 2018

The leading event for the whole of the UK's healthcare sector returns on the 25-26 September to ExCeL London

The NHS and UK health sector as a whole is going through unprecedented change. On a daily basis it faces the very real struggles of coping with an ageing population, intense pressure on A&E departments, modern lifestyle factors having a detrimental effect of people's health and wellbeing and operating with systemic financial challenges.

However, for all the very real challenges, there is also unbridled opportunity. The digitisation of healthcare systems, treatment and health condition management has really only just begun. With 26 Global Digital Exemplars Trusts, 3 Local Health and Care Records, the unknown potential of AI, advances in genomics

and precision medicines and increased funding to the life sciences sector, the future really is now.

This is why the UK Health Show's mission is to connect the NHS, private healthcare providers, national bodies, partners and suppliers through thought-provoking and educational content and a trade-show platform focused on the key opportunities and challenges in healthcare today.

The show is the UK's leading live-event platform connecting the NHS and the entire UK healthcare sector because it understands the need for a sustainable and forward-thinking business model for both the NHS



UK health show

BRINGING THE WHOLE OF THE UK SECTOR TOGETHER

**REGISTER FREE TODAY**

25-26 SEPTEMBER 2018, ExCeL LONDON



and private healthcare, which continues the UK's provision of world leading healthcare services that ensure the best possible patient outcomes.

The show covers the unprecedented challenges facing the NHS and healthcare systems in the UK, but also demonstrates its resilience and appetite for innovation and opportunity.

In 2018, the UK Health Show will enter its third year following its hugely successful launch in 2016. Born out of the Healthcare Efficiency through Technology show (launched in 2011) and Commissioning in Healthcare (launched in 2013) the show brings a rich legacy of being at the forefront of the industry.

Event Director and Head of Healthcare, Alexander Rushton says:

"Through the UK Health Show, we want to celebrate the leaders and the progressiveness, innovation and diversity from across the UK healthcare sector by focusing on four key opportunities and challenges facing the health sector today.

"These are digital technology, commissioning, procurement and cyber security.

"Having started my career in a Trust, before moving to the NHS Confederation and also spending a year working with the World Health Organization, I've seen first-hand the challenges facing the healthcare industry not only in the NHS and UK systems, but also the global systems.

"However, with that comes great opportunity and that is what we promote with the UK Health Show – the opportunity for the whole of the NHS, industry and the wider sector to meet, discuss, connect and find solutions to take advantage of the opportunities for success and overcome the challenges faced today."

With a strong content offering, the show will feature 11 content theatres delivering over 80 hours of content with a speaker faculty of over 200 leading experts and case studies. Coupled with the opportunity to meet 180 leading companies and organisations who are at the forefront of the healthcare industry, the UK Health Show is two days in year not to miss!

#### REGISTER FOR FREE TODAY

The UK Health Show takes place on 25 and 26 September 2018 at ExCeL London. To find out more and register for your free place, please visit [www.ukhealthshow.com](http://www.ukhealthshow.com). ■

# New Blockchain Health Insurance Product Eliminates Claims



MetLife Asia's Singapore-based innovation centre, LumenLab, has begun testing the world's first, automated insurance solution using blockchain technology to offer pregnant women financial protection in case of gestational diabetes, without ever needing to make a claim.

The experimental product, known as "Vitana," is Singapore's first dedicated insurance product for gestational diabetes – a condition affecting up to one in five expectant mothers in Singapore.<sup>1</sup> Vitana securely connects to customers' electronic medical records via their mobile device to issue a policy within minutes. It triggers an automatic payout upon diagnosis, without the need to make a claim.

"Vitana embodies MetLife's commitment to its customers. In today's world, people expect experiences to be simple, automated, and digital. We saw an opportunity to test how blockchain can make insurance more seamless and we've partnered with some of the best companies in their fields to create a blueprint to launch new parametric insurance products in the future," said Zia Zaman, MetLife's Chief Innovation Officer in Asia and Chief Executive Officer of LumenLab.

In addition to an enhanced experience, Vitana offers customers improved data security as it performs parametric underwriting on the customer's mobile device, meaning the insurance company doesn't require access to the underlying medical data to confirm insurability.

Vitana was built with partners: SwissRe, which helped drive product design and reinsure the risk; Cognizant, which provided the underlying technology and blockchain expertise; and Vault Dragon, an electronic medical records provider which supported on-the-ground implementation with forward-thinking doctors and clinics. Vitana was developed within the Monetary Authority of Singapore's (MAS) regulatory sandbox, and was highlighted in MAS' annual report as one of the key innovations to come out of the sandbox initiative.

"Experimentation is crucial to invent and create the future. We are glad that the sandbox has enabled LumenLab to jumpstart an innovative experiment within safe boundaries, to understand if it could effectively address existing pain points of both the insured and insurer, before rolling it out on a broader scale," said Sopnendu Mohanty, Chief FinTech Officer, MAS.

Customers can download Vitana via the App Store to receive up to SGD 2,500 coverage for medical expenses associated with gestational diabetes. The experiment will run over a six-month period and LumenLab is working with the Singapore Medical Group Women's Health as well as other select clinics to offer the solution to Singapore-based patients in their first 23 weeks of pregnancy.

1. Gusto, a longitudinal baby study at NUH and the KK Women's and Children's Hospital (KKH) (Khalik, S. 2016). ■



## Global Digital Health 100

The most innovative companies in the field of digital health

For more information please visit [www.thejournalofmhealth.com](http://www.thejournalofmhealth.com)



# Upcoming events

## September 2018

13-14

### Chief Nursing Officer Summit

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

18-19

### Bluetooth World

Santa Clara, CA, USA  
For more information visit:  
[www.bluetoothworldevent.com](http://www.bluetoothworldevent.com)

20-21

### 16<sup>th</sup> Annual Pharmaceutical IT Congress 2018

London, UK  
For more information visit:  
[www.oxfordglobal.co.uk/pharmatechnology-summit](http://www.oxfordglobal.co.uk/pharmatechnology-summit)

20-21

### Annual Artificial Intelligence in Drug Development Congress 2018

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

20-21

### Digital Health & Digital Technology Congress 2018

London, UK  
For more information visit:  
[www.oxfordglobal.co.uk/digitalhealth-congress](http://www.oxfordglobal.co.uk/digitalhealth-congress)

20-21

### Deep Learning in Healthcare Summit

London, UK  
For more information visit:  
[www.ti.to/rework/deep-learning-healthcare-summit-london-2018](http://www.ti.to/rework/deep-learning-healthcare-summit-london-2018)

25-26

### UK Health Show

London, UK  
For more information visit:  
[www.ukhealthshow.com](http://www.ukhealthshow.com)

## November 2018

14-15

### Diabetes Professional Care

London, UK  
For more information visit:  
[www.diabetesprofessionalcare.com](http://www.diabetesprofessionalcare.com)

15-16

### Frontiers Health

Berlin, Germany  
For more information visit:  
[www.frontiershealth.co](http://www.frontiershealth.co)

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We give partners the opportunity to communicate with a targeted audience of healthcare professionals and key decision makers at a wide range of major healthcare technology events around the world.

If you are interested in featuring content in the publication, please contact the team at [enquiries@thejournalofmhealth.com](mailto:enquiries@thejournalofmhealth.com)

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