INTRODUCING THE NHS INNOVATION ACCELERATOR
High impact, evidence-based healthcare solutions for patient, population and NHS staff benefit.
Foreword from
Professor Sir Bruce Keogh

I am delighted to introduce the NHS Innovation Accelerator (NIA): a nationally celebrated programme committed to the uptake and spread of high impact, evidence-based healthcare solutions for patient, population and NHS staff benefit.

Our current challenge within the NHS is how we continue to help an increasing number of patients, whilst, not only maintaining the quality of care we offer, but raising that quality in line with professional, public and international expectations. It is clear that the link between quality and productivity expectations is innovation.

Each of the 37 impactful innovations on the NIA, and the 36 individuals (‘Fellows’) who represent them, have been selected through a rigorous, multi-stage assessment process - involving patients, clinicians, academics, commercial leads and experts at the National Institute for Health and Care Excellence (NICE). Fellows share a commitment to spread the world’s best tried and tested innovations across the NHS, transforming the health and care of England’s population. They are helping the system to understand what the barriers are to innovation, where the opportunities lie, and how to alleviate some of the frustrations.

As a consequence of their endeavours, 964 additional NHS providers and commissioners are now using NIA innovations, £40 million external funding has been secured, and 116 jobs created (as of January 2018). Through the partnership between NHS England and the Academic Health Science Networks (AHSNs) nationally, the NIA is making an unprecedented impact on the NHS and the people it serves.

As the NIA enters its third year, never before has the importance of innovation for our NHS been as essential as it is now. And that is why the NIA truly comes of age in 2018.

Professor Sir Bruce Keogh

Chair of the NHS Innovation Accelerator Programme Board
Chairman of Birmingham Women’s and Children’s NHS Foundation Trust
‘Saving and improving lives: supporting the spread of high impact, evidence-based innovations across the NHS’

The NHS Innovation Accelerator (NIA), is a national accelerator supporting committed individuals (‘Fellows’) to scale high impact, evidence-based innovations across the NHS and wider healthcare system.

The NIA is an NHS England initiative delivered in partnership with England’s 15 Academic Health Science Networks (AHSNs), and hosted at UCLPartners. It was launched in July 2015 to support delivery of the Five Year Forward View, and aims to:

- Help create the conditions and cultural change necessary for proven innovations to be adopted faster and more systematically in the NHS
- Deliver innovation into practice for demonstrable patient and population benefit
- Capture insights from the Fellows’ experiences so that others benefit from knowledge generated

Selection process

As part of an annual international call, the NIA invites applications from exceptional individuals representing innovations which address clear needs and challenges faced by the NHS. To be appointed as an NIA Fellow, applicants need to demonstrate a set of values and passion for scaling their innovation to benefit more people across the country, and a willingness to openly share their learning on spreading innovations.

NIA Fellows come from a wide range of backgrounds, including clinical, industry and academia. Amongst the current cohort is a Multiple Sclerosis (MS) nurse consultant, an engineer, a former police officer, a respiratory consultant, a dentist, and even a sleep evangelist!

All innovations selected to join the NIA undergo a robust, competitive process, involving an expert group of over 100 assessors - including patients, clinicians, commercial directors, improvement directors, information governance leads, etc., from a wide range of organisations including NHS England, NHS Digital, AHSNs, the National Institute for Health and Care Excellence (NICE) and The Health Foundation.

The selection process involves the following stages:

1. **Screening**
   Applicants are required to detail how their innovation meets the priorities, needs or challenges of the care system in England. This includes the problem it addresses, evidence as to its effectiveness, and the strategy for scaling in the NHS.

2. **Assessment**
   Applications are reviewed by at least five assessors with a range of perspectives, including patients, clinical, commercial and implementation. Applications are assessed and scored on the basis of the individual applicant, the innovation, and the scaling strategy.

3. **NICE review**
   Applications shortlisted for interview are informally reviewed by NICE.

4. **Interview**
   Shortlisted applications are invited to attend a panel interview, comprising expert representatives with a range of perspectives, including patients, clinical, commercial and implementation. This panel will make recommendations as to whether the applicant should be invited to join the NIA. These recommendations will be taken to a final Evaluation Panel.

5. **Selection**
   The Evaluation Panel is chaired by Professor Sir Bruce Keogh, former NHS England National Medical Director and Chair of the NIA Programme Board.
Impact to date

As of January 2018, 36 Fellows have been supported to scale 37 innovations across the NHS, achieving impressive results:

- **964 additional** NHS sites are now using NIA innovations
- **£40million** external funding secured
- **116 jobs** created
- **29 awards** won
- **13 innovations** selling internationally

Sharing learning and insight

The NIA provides real-time practical insights on spread to inform national strategy. The collective Fellows continue to develop a body of learning as to the enablers and barriers to achieving innovation uptake, and the NIA is committed to sharing these learnings with the system. Visit www.nhsaccelerator.com for more information.

All Fellows are supported by a learning programme to help them take their innovations to a larger number of patients at a greater pace. This learning element has been co-designed with patient networks, Fellows, and AHSN partners around an agreed set of principles, to ensure it is agile and adaptive, builds from existing national and international infrastructure (rather than reinventing the wheel), is collaborative, and enables the Fellows to test hypotheses around diffusing innovations within the NHS.
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AliveCor Kardia

Mobile ECG that instantly analyses and interprets heart recordings, identifying AF, a leading cause of stroke.

Summary
AliveCor’s Kardia Mobile Electrocardiogram (ECG) device is a mobile heart monitor that allows individuals to detect, monitor, and manage heart arrhythmias with automatic analysis. AliveCor’s Kardia captures ECG recordings of the heart using FDA-cleared machine algorithms in 30 seconds, anytime, anywhere; providing instant feedback. The device can also be used to capture symptoms such as shortness of breath, heart palpitations, dietary habits, sleep and exercise patterns. Based on the number of published, peer-reviewed clinical studies using Kardia Mobile, Kardia is the most clinically-validated mobile ECG available.

Challenge
According to the National Cardiovascular Health Intelligence Network (NCVIN, 2016), the estimated prevalence gap for people aged 64 and over with atrial fibrillation (AF) not yet diagnosed is 420,498. Left undetected and untreated, this presents a risk of over 12,600 AF-related strokes per year in England. Early detection and monitoring can pave the way for better treatment for people with AF: avoidance of illness, disability and premature death associated with AF-related strokes, and major healthcare savings. Conservatively, an AF-related stroke costs the NHS £12,228 (NICE CG 180) in the first year.

Impact
- 22 million ECG recordings to date
- Currently used in over 38 NHS organisations across all 15 Academic Health Science Networks (AHSNs)
- Used within Care City Innovation Test Bed (north east London)
- Potential cost saving of £1,000 per patient in diagnosing AF
- Dramatically reduces diagnosis time and time to drug therapy

“I love my AliveCor and can’t praise it highly enough. It’s so quick and easy to use and always close to hand. Since having my AliveCor, I feel in control and very reassured. Before I had my device it was so hard trying to explain to medical staff how I felt and what was happening when I was having an atrial fibrillation episode.”

Patient

Key words: • Atrial Fibrillation • Digital • Early Intervention • Prevention • Primary Care
Dip.io is a smartphone based urinalysis device. Built around the existing urine dipstick, a test kit and smartphone application, Dip.io enables home urine testing with no quality compromise.

Summary
Healthy.io is the first company to turn the smartphone into a regulatory-approved clinical device. Its first product, Dip.io, uses computer vision and user centric design to turn the smartphone into a urinalysis device. Built around existing semi-quantitative urinalysis dipsticks, Dip.io complements established clinical efforts by empowering patients to test themselves at home with no quality compromise, and securely share results with a clinician.

Challenge
Smartphone urinalysis impacts a range of pathways:

- Pre-natal: Dip.io is currently used for self-management in hypertensive pregnancies with one of Israel’s leading health maintenance organisations, and demonstrated strong favourability during a trial at Johns Hopkins.
- Chronic Kidney Disease (CKD): Home-based screening of albumin:creatinine (ACR) for people with diabetes or high blood pressure, to increase adherence to NICE CG 182 and diabetes care process beyond the current level of 50%.
- Urinary tract infections (UTI): Enables self-testing for UTI to reduce unplanned admissions in people with Multiple Sclerosis (MS). Dip.io also reduces the need for GP visits in women aged 18-64 (e.g. through integration with NHS 111 and pharmacies).

Impact
- CE approved and ISO 13485 certified
- 99.5% usability rates in FDA clinical trials covering 500 patients across demographics
- Johns Hopkins prenatal study demonstrated that less than 10% preferred testing at the clinic
- Roll out of home ACR screening in collaboration with US National Kidney Foundation

FELLOW
Katherine Ward

“UCLPartners sees great potential in the digital application of point-of-care urinalysis and is working closely with Healthy.io to integrate this innovation into appropriate care pathways within the NHS.”

Dr Charlie Davie, Managing Director, UCLPartners

Key words: • Digital Health • Early Intervention • Prevention • Primary Care • Self-Management
EARLY INTERVENTION AND DIAGNOSTICS

Genome analytics software facilitating rapid identification and interpretation of inherited disease, resulting in faster diagnoses for rare disease patients.

Summary
SAPIENTIA™ is a genome analytics software from Congenica, enabling healthcare professionals to interrogate the human genome for pathogenic DNA variants likely to be the cause of a patient’s inherited disease. With SAPIENTIA™, clinicians can access all of the information required to make an actionable interpretation of a patient’s genome. This technology, developed from a Wellcome Trust Sanger Institute translational research study, is particularly relevant for rare diseases, 75% of which have a genetic cause that manifests during childhood.

Challenge
An individual rare disease may affect fewer than five in 10,000 people; but with over 7,000 rare diseases, approximately one in 17 people will be affected during their lifetime. On average, it takes over five years for a rare disease patient to receive a confirmed diagnosis, during which time they will see, on average, seven clinicians and receive multiple misdiagnoses. SAPIENTIA™ facilitates the rapid identification and interpretation of disease causing variants, enabling a single clinician to make a diagnosis within five days.

Impact
- SAPIENTIA™ was selected as an interpretation partner for the UK 100,000 Genomes Project in 2015 and has allowed in-house clinical experts to analyse data from the project in as little as 30 minutes from data to report
- Congenica has returned over 1,600 genome reports (January 2018) and is being used by 12 of the 13 Genomic Medicine Centres (GMCs) in the UK as part of the project
- SAPIENTIA™ is in use across the NHS, in China and the USA

“`We’ll be working alongside Congenica to deliver the vision that NHS England and Genomics England have of using genomic testing to unlock the potential of genetic medicine to benefit our patients and transform the NHS.”`

Professor Graeme Black, Professor of Genetics and Ophthalmology, Central Manchester University Hospitals Foundation Trust

Key words: • Diagnostics • Discovery • Genome Analytics Software • Rare Disease
Diagnostic pathway detecting chronic disease at a life or death stage.

**Summary**
This diagnostic pathway detects significant but asymptomatic chronic liver disease at a critical stage in which it can either progress or reverse. The pathway combines both the identification of patients at risk of chronic liver diseases and utilises proven diagnostic tests to detect and stratify the risk. Thirdly, it aims to provide a seamless pathway between Primary and Secondary Care.

**Challenge**
Liver disease is now the fifth largest killer in the UK. Currently 50% of new diagnoses of liver cirrhosis occur only after emergency admission to hospital.

"Taking part in this project changed my life. It enabled me to take control of my life once again after a period of alcohol dependency. The whole process has had a positive effect on myself and my family. Find it hard to say how lucky I feel to have taken part in the project. A real game changer for me!"

*Patient*

**Impact**
- The pathway was initially tested in a catchment area of 25,000 patients in different socio-ethnic backgrounds and shown to be feasible
- NHS innovation challenge prize winner in diagnostics (2013)
- Shown to increase detection of significant liver disease, and to be cost-effective
- Funding secured for continued scaling with support from East Midlands AHSN
- Secured commissioning for new pathway in 2016 to cover a population of 0.7 million and over 100 GP practices in four CCGs

neil.guha@nottingham.ac.uk

www.scarredliverproject.org.uk
MENTAL HEALTH
The FREED model of care provides a rapid early response intervention for young people aged 16 to 25 years with short (three years or less) first episode eating disordered duration.

Summary
FREED overcomes barriers to early treatment and recovery. Components include rapid screening and assessment protocols, evidence-based interventions that specifically attend to the needs of young people and their families (including options for online treatment), and an implementation toolkit. FREED is effective at reducing waiting times, improving treatment engagement, and promoting full recovery.

Challenge
A 2015 report estimated the UK prevalence of eating disorders (ED) at 600,000 - 725,000 people, with up to £4.6 billion associated NHS treatment costs. ED carry high levels of disability, and mortality is amongst the highest for mental health disorders.

Impact
- Reduced waiting time for treatment by approximately 50% compared to audit data from matched patients*
- Improved treatment uptake by 100% compared to 73% for audit patients*
- 59% patients with anorexia nervosa reached a healthy weight by 12 months, versus 17% of the audit sample*

*Initial evaluation where implemented

Key words: • Care Model • Early Intervention • Pathway

“FREED came along at just the right time. With such bespoke support, I was able to really leave the eating disorder behind. Instead of dropping out, I stayed at university and embraced its opportunities. I involved myself with university life in a way that I couldn’t whilst the eating disorder monopolised my time.”

Service User
MENTAL HEALTH

Model of care aimed at improving delivery of mental health services for children, young people and their families.

Summary
The THRIVE framework is an integrated, person-centred and needs-led approach to delivering mental health services for children, young people and their families. It conceptualises need in five categories: Thriving, Getting Advice and Signposting, Getting Help, Getting More Help and Getting Risk Support. Emphasis is placed on prevention and the promotion of mental health and wellbeing. Children, young people and their families are empowered through active involvement in decisions about their care through shared decision-making, which is fundamental to the approach. The i-Thrive team is working with CCGs, NHS Trusts and local authorities across the country to implement the framework.

Challenge
Mental illness represents a quarter of the nation’s overall burden of disease, affecting at least ten per cent of children aged five to 16 years. Yet despite the vast scale of this challenge, only one quarter of those with mental illness are receiving treatment.

Impact
- i-Thrive Community of Practice has spread to 72 CCG areas
- 47% of England’s young people covered by i-Thrive Community of Practice
- i-Thrive academy established in London, providing training for clinicians

“i-Thrive is providing a systematic and population-focussed approach to improving the targeting of interventions for children, young people and their families. This implementation of the THRIVE model increases the efficiency and enhances the effectiveness of clinical services so that we can deliver better outcomes to more children.”

Professor Peter Fonagy, Programme Director for the AHSN Integrated Mental Health Programme at UCLPartners, National Clinical Lead of Improving Access to Psychological Therapies for Children and Young People

Key words: • Children and Young People • Early Intervention • THRIVE Model
MENTAL HEALTH

Join dementia research

Digital platform connecting researchers and people interested in dementia research with opportunities to participate in studies.

Summary
Join Dementia Research allows people with and without dementia to register their interest in participating in research via the internet, post or telephone; and matches them to appropriate studies. Once matched, individuals and researchers are able to discuss participation in studies.

Challenge
Dementia affects about 850,000 people in the UK, with a cost of £26 billion per annum. 60,000 deaths a year are directly attributable to dementia. The only way to beat the condition is through research. One of the big difficulties researchers face today is recruiting participants for their studies. At the same time, many people are looking for studies to contribute to and take part in, but do not know where to find out about them.

Impact
• 32,600 people now signed up to Join Dementia Research
• 194 studies have now enrolled people through Join Dementia Research
• 9,128 people enrolled in studies through Join Dementia Research, and 28% of volunteers have participated in a study
• £2.3 million in commercial research income generated for Join Dementia Research’s organisational users

(Statistics and values correct as of January 2018)

Mr and Mrs S

“One of the reasons I wanted to get involved in the research was the fact that it was quite debilitating, frightening when Ron was diagnosed with Alzheimer’s and if I can help in anyway, it might not help us but it might help the next generation. And as ex-teachers, we would like to help the future.”

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@beatdementia

Key words: • Dementia • Digital • IT Platform • Research
Model of care using specialist police officers within community mental health services to help support service users struggling with complex, behavioural disorders.

**Summary**
The Serenity Integrated Mentoring (SIM) model of care combines the best clinical care with compassionate but consistent behavioural boundary setting to reduce harm, promote healthier futures and reduce repetitive patterns of crisis from impacting 999 and other emergency care teams.

**Challenge**
SIM supports the small number of service users in every community struggling with complex mental health disorders who often request emergency services whilst making limited clinical progress. It is estimated that the basic cost of a single highly intensive service user of police and ambulance response, emergency department attendances and mental health beds is at least £19,800 per year (if there is no specialist intervention), and that there could be as many as 3,500 service users needing this model of care across the UK at any one time. That’s a £69 million problem.

**Impact**
- 90% reduction of frontline emergency costs
- 50%+ reduction in total number of service users reaching 999 level of crisis
- Twice as effective as Street Triage in reducing s136 detentions
- SIM helps service users re-engage with their community and employment
- SIM supports service users to achieve discharge from secondary mental health services

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“\[I\] believed from the outset that the SIM model was an important clinical innovation, with huge potential to improve urgent healthcare. I have been impressed way beyond my expectations with the incredible hard work, absolute rigour, systematic training and delivery of the SIM content through its own interactive, digital platform. It’s not often I recommend a programme without reservation but this is one!\”

Dr Geraldine Strathdee, CBE, MRCPsych, Former National Clinical Director for Mental Health, NHS England

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**Key words:** Community of Practice • Demand Reduction • High Intensity Service Users • Mental Health Crisis • Model of Care
PRIMARY CARE AND URGENT CARE
Addressing the inappropriate use of NHS services when self-care would be more appropriate, the CATCH app gives parents information when they need and want it, via smartphone or tablet.

**Summary**

CATCH (Common Approach To Children’s Health) gives parents appropriate and understandable information when they need and want it, in a timely and measured way, via smartphone or tablet. Support and clinical knowledge is aggregated from an area’s GPs and public health department, building a region-specific, tailored, trusted resource that parents can re-use, giving them the confidence to look after their children at home. CATCH curates this local health information and articles from trusted sources, such as NHS Choices.

**Challenge**

CATCH addresses the inappropriate use of NHS services, when self-care would be more appropriate.

**Impact**

- 28% reduction in under five-year-old’s Guidance-Only A&E attendances reported by Eastern Cheshire CCG in winter 2016/2017 compared to 2015/16
- 47% of users deciding self-care over an A&E visit*
- 64% of users deciding self-care over a GP visit*
- 91% of users would recommend CATCH to a friend or relative*

*Based on 284 responses from user satisfaction survey conducted by Eastern Cheshire CCG

""Often, [parents’] anxieties stem from not knowing what else to do when their child is ill. The CATCH app offers guidance and reassurance for parents to provide self-care for their children at home, without visiting the hospital."

Dr Kilroy, Lead Clinician for Emergency Medicine, Macclesfield Hospital

**Key words:** App • Digital Health Service • Early Intervention • Prevention • Primary Care
A cloud-based tool built to help NHS Providers build virtual clinical staff banks and fill empty shifts in rotas.

Summary
Lantum is a bespoke staffing management platform for NHS providers, designed by doctors and rota managers over five years. Lantum offers a secure online environment where providers can advertise shifts for their own clinical staff to book at any time via any device. The tool integrates with clinical staff calendars to efficiently match available clinicians with open shifts. The smartphone app for clinical staff allows them to cover shifts quickly, on the go, 24/7. Clinicians love Lantum because of the easy-to-use tools to help them manage their time and automate all of their work-related administration. Lantum has been adopted by 40 GP Federations across the UK and aims to support more healthcare providers across all staff grades.

Challenge
Melissa Morris, the founder and CEO, came up with the idea of Lantum whilst working at NHS London, recognising how much time, effort and money was wasted on organising rotas as well as on filling gaps through agencies. £3.5 billion annually is spent on recruitment agencies in the NHS. Lantum also improves clinician engagement, ensuring that only relevant shifts are matched with clinicians rather than bombarding them with long emails listing jobs they could not do. The software tools that Lantum provides to clinicians, frees up hours of their time previously spent completing pension forms and creating invoices.

Impact
- £3 million savings for the NHS in under five years by providing a free platform for providers to manage their existing clinical workforce
- 3.5 million patient appointments have been fulfilled by the GPs on Lantum
- £200,000 savings for the average Federation or Urgent Care Centre per annum by adopting Lantum versus using a recruitment agency
- Support to meet CQC requirements - rota managers can improve governance processes by creating cloud-based profiles for staff
- 30% to 50% more shifts being filled by providers’ own clinical staff banks, thereby reducing use of agency staff and improving continuity of care

Key words: • IT Platform • Recruitment • Staff Banks • Workforce Management
Health and care apps can offer huge benefit to patients, really empowering them to manage and improve their health. However, there is a huge choice out there, so ORCHA really helps all involved to understand which are the best and most trustworthy.”

Dr George Dingle, GP, Morecambe Bay area

ORCHA works with CCGs and Providers to develop health app portals, allowing professionals easy and clear access to a verified resource, enabling them to find and recommend the best apps to patients.

Summary
ORCHA works with CCGs and Providers to develop health app libraries which integrate with local systems and strategies. This allows professionals easy and clear access to a verified resource, allowing them to enhance services and outcomes by finding and prescribing the best apps to patients. ORCHA is currently working with a growing number of health and care economies which enable local populations to gain access to a trusted health app store.

Challenge
ORCHA provides a live resource of reviewed health and care apps which can be easily searched, compared, recommended, and downloaded through its easy-to-use platform. Thorough reviews and a simple scoring system highlight functional capabilities of the apps, making it easier for users to confidently and quickly compare and choose the best apps.

Impact
- Data collation and reporting of app usage by population, patient and professional group, to help assess and prove digital strategies, investment and outcomes
- Activating over eight million people and patients to use healthcare apps in England
- Over 90% of healthcare professionals believe that health apps will increase their knowledge of patients’ conditions*

*2015 Research Now Group study of 500 healthcare professionals and 1,000 health app users

Key words: • Apps • Digital • Prevention • Primary Care • Self-Care
Sore Throat Test-And-Treat

A walk-in service at community pharmacies where patients receive screening and point of care testing, with the aim of reducing low acuity GP appointments and inappropriate antibiotic prescribing.

Summary
Sore Throat Test-And-Treat is a walk-in service at community pharmacies where patients can receive screening and point of care testing for group A streptococci, which causes bacterial infections in the throat. If tested positive, patients can receive antibiotics from a pharmacist without the need to visit the GP. Patients using the service reported a highly positive experience, noting the convenience of having a local walk-in screening service compared to taking time off work to attend a GP consultation.

Challenge
Each year around 1.2 million people visit the GP with a sore throat, and recent studies show that 62% of these visits result in the prescribing of antibiotics. A service feasibility study has shown that less than 10% of people who present with a sore throat actually have a group A streptococci bacterial infection. In response to concerns of unnecessary GP visits for sore throats and the unnecessary prescribing of antibiotics for viral infections, the Sore Throat Test-And-Treat service was developed.

Impact
- By providing an alternative pathway for patients, the service could remove the need for 800,000 GP consultations, if rolled out nationally, equating to £34 million each year
- The pathway can help to reduce unnecessary antibiotic prescribing by ensuring that only those with a confirmed infection receive antibiotics
- By providing effective and accessible care for patients, away from general practice, the new pathway could help to change public behaviour, reducing demand in Primary Care in the future

Key words: • Early Intervention • Medicines Management • Pathway • Point of Care Testing • Primary Care

“This is a great service. I didn’t know that I could get this test done at my pharmacy.”
Service User

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@harrison_mal
Free, patient-facing app which shows patients the fastest place to access urgent care services for minor emergencies.

Summary
Commissioned by CCGs and co-designed by patients and GPs, WaitLess was launched in east Kent in December 2016. The app allows people with minor injuries to select the location which will get them access to treatment fastest. It combines live feeds from A&E departments and all types of Urgent Treatment Centres, showing the number of people waiting and waiting time. The app then combines this with the travel time to the location, and expresses this as a single figure.

Challenge
Pressure has been growing across A&E services each year since 2005. Most A&E attendances are from self-presenting patients, attending A&E with conditions that are associated with minor injuries, ailments and minor emergencies, which can be seen in other departments like the Minor Injuries Unit or the Urgent Care Centre. Local and national studies recognise that many of these patients could be treated more quickly closer to home by accessing commissioned services provided outside of hospital.

Impact
- 11% reduction in minor injuries activity in A&E, specifically during the busiest times of day
- 5% reduction in minor injuries activity across the board
- 125,000 uses (as of January 2018) with 99.6% patient satisfaction rate

Key words: App • Minor Injuries • Urgent Care • Waiting Times
SAFETY, QUALITY AND EFFICIENCY WITHIN HOSPITALS
Online and SMS-based service enabling patients to manage hospital bookings, while allowing hospitals to engage and respond to patients, optimise processes, measure value and adapt for the future of healthcare.

Summary
DrDoctor is an online and text-based service that allows patients to confirm, cancel, and change bookings digitally. For hospitals, this means they can maximise and manage patient volume to best fit their capacity. The technology can target long waiting lists and automatically book patients into empty slots in clinics. In addition, it provides digital assessments before and after appointments, saving time for both patients and caregivers.

DrDoctor is a digital health company transforming the way hospitals and patients communicate, by using common-sense technology to tackle the financial strain on the NHS - one hospital at a time. We bring patient correspondence into the 21st century, to automate processes, collect outcomes, measure value and drive down costs. Our platform improves appointment scheduling, increasing clinic efficiency by reducing no-shows and filling empty slots, and is currently deployed across major hospitals around the UK.

Challenge
DrDoctor tackles the challenge of ensuring that the right patient gets to the right place at the right time, both with regards to missed appointments and a lack of needs based follow-up within healthcare in the UK.

Impact
- Reduced time to first contact by eight days
- Increased utilisation by 10%
- Cut waiting lists by 10-15%
- Produces average savings of £1.8 million per year for each acute trust
- Paperless letters feature at Guy's and St Thomas’ NHS Foundation Trust has resulted in 40% more appointments attended and an increase in patient engagement, choice and self-management
- Reduced ‘Do Not Attend’ rates by 47% at Aneurin Bevan
- £3.6 million annual savings at Guy’s and St Thomas’ NHS Foundation Trust
FELLOW
Dharmesh Kapoor

Patented fixed angle scissors that take away human error in estimating episiotomy angles during childbirth.

Summary
Use of Episcissors-60 reduces the risk of complications associated with standard practice episiotomies, which can cause obstetric anal sphincter injuries (OASIS) and have a devastating impact on the quality of a new mother's life.

Challenge
Each year 30,000 women across the UK suffer from OASIS. This is often due to misjudging the angle of surgical cuts during childbirth. Episiotomy angle is a crucial factor in causation of OASIS. Sutured episiotomies angled too close to the midline (less than 30 degrees) or too far from the midline (more than 60 degrees) fail to unload the perineum sufficiently and predispose women to OASIS. OASIS is a serious complication and is the single most important cause of anal incontinence (AI) in women. With over 15% of all births in England needing an episiotomy, there is a clear unmet clinical need to reduce incidence of OASIS and to protect mothers from avoidable harm.

Impact
- Episcissors-60 has reduced OASIS by up to 50% in five UK NHS hospitals
- Results at London-based Trusts have shown a reduction in OASIS in instrumental births down from 8.8% to 0.6% and in normal births down from 4.3% to 0%
- Episcissors-60 are available to procure via the 2017-19 Innovation and Technology Tariff

“After the introduction of Episcissors-60, we found that 86% of doctors and 100% of midwives were able to achieve post-suturing angles between 40 degrees and 60 degrees... user feedback showed high rates of satisfaction in using Episcissors-60 among all users.”

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Key words: • Maternity • OASIS • Patient Safety
ERAS+

Pathway reducing post-operative pulmonary complication (PPC) risk by preparing patients for and recovery from major surgery.

Summary
ERAS+ puts patients at the centre of their own care, as they prepare to undergo surgery. The pathway provides advice and structure for training on exercise, nutrition, lifestyle and oral healthcare information to help patients play a more active role in preventing PPC, with a focus on the six weeks prior to and the six weeks after surgery. ERAS+ provides bespoke educational tools, including information videos and the multi-disciplinary led ‘Surgery School’, where healthcare professionals provide groups of patients with enhanced preparation for major surgery.

Challenge
Each year, more than 200,000 major elective surgical procedures are performed in England and Wales, which carry a PPC risk of up to 30%. This can lead to increased length of stay and reduced life expectancy. ERAS+ works to reduce the PPC risk by better equipping patients and families in their preparation for and recovery from major surgery.

Impact
- Successfully reduced PPC by over 50% where implemented
- Reduced post-operative hospital length of stay by three days where implemented
- Delivered £200,000 in annual savings where implemented
- Currently working with national Macmillan team to support implementation

“I was given two to three weeks’ advanced notice of the surgery to remove the cancer and what helped me most was the support I received through the ERAS+ programme. I felt empowered. I was part of the team preparing me for my surgery, not just a person this was all happening to. The programme let me take charge of my own care and feel that I was able to influence the outcome of my treatment.”

Sarah Lowe, Patient

Key words: • Educational Tools • Enhanced Recovery • Pathway • PPC • Surgery
Home monitoring of hypertension in pregnancy (HaMpton)

New care pathway involving the use of an app for monitoring high blood pressure at home, empowering expectant mothers to be involved in their own care.

Summary
Home monitoring of hypertension in pregnancy, or HaMpton, is a new care pathway developed by the maternal fetal medicine team at St George’s Hospital, London. This pathway involves the use of an innovative smartphone app for monitoring high blood pressure at home. The app alerts women if they need to attend the hospital, and it also links with a hospital computer system where the data can be monitored by clinicians in real time. HaMpton empowers women to be involved in their own care, reduces the number of hospital visits, and has achieved excellent patient and staff satisfaction.

Challenge
High blood pressure disorders complicate 10% of pregnancies and pre-eclampsia affects between 2% - 8%. Pre-eclampsia can be life threatening for both mother and baby. Standard care pathways for women who have high blood pressure in pregnancy require frequent hospital visits. This has significant cost implications, both to the NHS and to patients, and can cause anxiety to pregnant women.

Impact
- 53% reduction in number of appointments for hypertension monitoring, and amount of time per appointment
- £300 average cost saving per patient per week according to basic health economic study
- £50 million potential annual cost saving if scaled up across the UK

"This home-monitoring service has been very good for me because I can do it at home, in comfort, and in much more realistic surroundings. If there is a problem, I can call up - there’s always someone to talk to - and if things really get bad, I can get called in. But no time is wasted on either side."

Patient

Key words: • Digital • Early Intervention • New Care Model • Pathway • Primary Care
Mobile, clinical platform that delivers patient safety and flow improvements to acute hospitals, through real-time data and communications.

**Summary**
Applications include patient flow, sepsis, vital signs, risk assessments, clinical photography. County Durham and Darlington NHS Foundation Trust has extended its use of Nervecentre to support sepsis screening and the associated escalation of care. The platform captures vital signs, early warning score (EWS) and pathology results to inform the early diagnosis of sepsis. Critically, when a patient presents early indications of sepsis, the platform’s intelligent alert system immediately alerts the right clinicians and nurses to ensure that care is appropriately escalated, prioritised and carried out.

**Challenge**
Nervecentre Software addresses the absence of strong real-time data and clinical collaboration tools in the market. It aims to improve hospital communication, in order to support significant improvements in patient safety and flow.

**Impact**
- Improved percentage of patients screened for sepsis to 100%
- Improved percentage of time a patient receives antibiotics within the hour following a positive sepsis trigger from less than 50% to over 90% in one month
- Reduces unplanned admissions, equating to £1 million savings per year
- Improves nurse efficiency and allows doctors to spend more time with their patients (from 2.9% to 7.3%)
- Over 20,000 nurses and doctors now use Nervecentre daily in the NHS

“The deployment of Nervecentre Software means that we can reduce the burden of paperwork for nurses and clinicians, releasing more time to spend with patients. The use of mobile technology also allows doctors and nurses to have all the tools and information at hand to be able to respond rapidly and effectively to deteriorating patients.”

Heather McClelland, Calderdale and Huddersfield NHS Trust

**Key words:** • Acute Hospital • Clinical Platform • Mobile Platform • Patient Flow • Software
Non-Injectable Arterial Connector (NIC)

A medical device enhancing safety and care for patients requiring an arterial line in operating theatres and intensive care.

Impact

- The NIC does not need to be changed with each blood sample, staying on the luer sampling and transducer ports for the lifetime of the arterial set.
- The NIC prevents bacterial contamination of the arterial set. By using a NIC on both transducer and sampling ports, it is possible to extend the arterial set up to seven days.*
- Savings of £285 per year per Trust in equipment costs.
- Available to procure at zero cost via the 2017-19 Innovation and Technology Tariff.

*Hodges et al., Extending the use of the arterial transducer set using the non-injectable connector. Presented at the Intensive Care Society State of the Art Conference, 2017

Summary

The Non-Injectable Arterial Connector (NIC) is a low-cost, simple device that stops wrong-route drug administration, reduces arterial line-related infections, and prevents blood loss during sampling. The NIC is a needle free arterial connector. Unlike standard connectors, it has a one-way valve safety feature built into it. This safety feature allows clinical staff to use the NIC as per normal clinical practice, however, if they attempt to wrongly give medication via the arterial line, the clinician is prevented from doing so by the safety feature. Adoption of the NIC requires minimal staff training.

Challenge

Arterial lines are used for monitoring blood pressure and taking blood samples for patients admitted to critical care or requiring major operations. If medication is accidentally or wrongly administered via this arterial line, patients can suffer serious harm which can potentially lead to amputation. An anonymised national survey reported that 28% of Intensive Care Units (ICUs) had experienced wrong route drug administration into the arterial lines in the past five years.

Key words: • Device • Prevention • Safety
PneuX Pneumonia Prevention System

Cuffed ventilation tube and electronic cuff pressure monitor and controller designed to stop leakage of pathogenic oral secretions and stomach contents into the lungs, preventing ventilator-associated pneumonia (VAP).

Summary
Unlike standard ventilation tubes, PneuX has a cuff which achieves an effective seal inside the patient’s trachea, which prevents leakage or aspiration of bacteria-contaminated secretions into the lungs. The cuff pressure monitor continuously measures pressure and ensures the seal remains effective at all times, even when the patient coughs or moves. PneuX can be used in any patient requiring mechanical ventilation in the Intensive Care Unit (ICU), emergency department or for patients undergoing major surgery in operating theatres.

Challenge
Ventilator-associated pneumonia (VAP) is the leading cause of infective hospital-acquired mortality, affecting up to 20,000 patients per year and causing almost a third of those affected to die. Each episode costs the NHS between £10,000 and £20,000. Standard endotracheal tubes allow the leakage of bacteria contaminated secretions from the mouth and stomach contents, past the endotracheal tube cuff and into the patient’s lungs, leading to VAP.

Impact
- An independent health economic evaluation by the University of Birmingham and the Royal College of Surgeons, based on an NHS England funded patient study at New Cross Hospital, showed that using the PneuX has a cost saving to the NHS of £718 for every patient, when introduced into the ICU
- PneuX shows zero leakage of bacteria, compared with other endotracheal tube cuffs on the market, each of which show a degree of leakage
- Available to procure at zero cost via the 2017-19 Innovation and Technology Tariff

"We are hugely impressed with the direct benefits to patient safety, through [preventing] avoidable harm and improving outcomes. We urge healthcare providers... to ensure the system is adopted. From a patient's perspective, this is an opportunity that cannot be ignored."

Trevor Fernandes, Co-Chair, East of England Citizen’s Senate

Key words: • Device • Prevention • Safety
RespiraSense

Patient safety tool that improves quality of care by enhancing ability of medical teams to identify the deteriorating patient up to 12 hours earlier than the standard of care.

Summary
Identifying the deteriorating patient as early as possible is still a significant challenge that faces NHS hospitals. RespiraSense is the world's only continuous, motion-tolerant, respiratory rate monitor. Respiratory rate has been proven to be the earliest and most sensitive indicator of patient deterioration, more so than heart rate or systolic blood pressure. Yet respiratory rate is measured with significant bias, thereby contributing to 31% of acute care deaths resulting from poor clinical monitoring.

Challenge
Deteriorating patients experience serious adverse events such as sepsis shock and respiratory compromise, putting pressure on intensive care units (ICUs) and bed capacity during key flu seasons. The need to identify the deteriorating patient is essential to ensure timely patient discharge and to improve patient flow from A&E to the inpatient setting. Respiratory rate, a powerful component of National Early Warning Score (NEWS), is poorly monitored; yet it is the earliest sign of patient deterioration.

Impact
- Identifies the deteriorating patient up to 12 hours earlier than the standard of care
- Improves patient flow by reducing rate of preventable escalations of care, and supporting timelier patient discharge
- Supports improvements in quality of care and patient safety
- Releases capacity and improves healthcare economics to realise a 70% return on hospitals’ investment
- Over £115 million potential net savings in pneumonia and sepsis pathways, from 5% reduction in preventable escalations of care

RespiraSense will support hospitals to reduce their average length of stay for pneumonia and sepsis admissions by triggering timely intervention and timely discharges.

Key words: • Deteriorating Patient • Digital • Early Intervention • Monitoring • Pneumonia • Sepsis

“RespiraSense provides a unique way of continuously monitoring respiratory rate, offering a safe and motion-tolerant solution that will identify deteriorating patients earlier, improve patient safety, and reduce the burden of emergency care on the NHS, as well as releasing clinical staff for time to care.”

Professor Anoop Chauhan, Portsmouth Hospital NHS Trust

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@PMD_Respiratory #MakingEveryBreathCount
WireSafe

An engineered solution to prevent the never event of retained central line and Seldinger chest drain guidewires.

Summary
The WireSafe is a novel locked procedure pack which prevents the never event of retained central line, vascaths and Seldinger chest drain guidewires. The WireSafe contains the equipment required to complete a central line insertion after the guidewire is normally removed: suture, suture holder, forceps and dressing. The only way to access the equipment is by unlocking the WireSafe with the guidewire. This human-factors forcing function ensures that clinicians always remove the guidewire, preventing the never event.

Challenge
When a central line catheter is placed, a guidewire is used to correctly position the catheter in the vein, and then it should be removed. The guidewire is lost when the clinician forgets to remove it at a crucial point in the procedure. If this occurs, the guidewire can travel to the patient’s heart causing significant harm and requiring a further procedure to remove the guidewire at a tertiary centre. Retained guidewires have a reported mortality of up to 20%, an incidence of 1:3000 procedures and are a never event.

Impact
- Guidewire retention occurs in 1:3000 insertions
- Found to be 100% effective in one randomised control trial (RCT)
- Prevents a never event, protects patients and supports front line staff
- Helps to protect clinicians from sharps injury
- Recipient of the President’s Award for Outstanding Achievement from the Royal College of Anaesthetists

“I know of doctors who have forgotten to remove the guidewire. As far as I can see, the WireSafe makes this error all but impossible, protecting both staff and patients.”

Clinical staff member

Key words: Device • Never Event • Prevention • Safety
Free, evidence-based app that motivates an effective oral hygiene routine

Summary
The main feature of the Brush DJ app is a timer which plays two minutes of music from the user’s device or streaming service. This makes the mundane task of brushing for the correct length of time more enjoyable and therefore more likely to happen. The app also contains the evidence-based oral health information given in the Public Health England document: ‘Delivering Better Oral Health’. No passwords, in-app purchases or personal details are required and it can be used with any toothbrush.

Challenge
The treatment of dental disease costs the NHS £3.4 billion per year. In England, 26,000 children aged between five and nine years-old, undergo a traumatic and expensive general anaesthetic to remove decayed teeth each year. The extraction of decayed teeth is the most common reason for children in this age range to be admitted to hospital. Tooth decay can be prevented with an effective oral hygiene routine and a healthy diet.

Impact
- Over 300,000 downloads in 197 countries
- Only oral health app to have been accepted into the NHS Digital Apps Library
- Promoted by the British Dental Association (BDA)
- Over 90% of reviews on Google Play and the Apple App Store are rated five-star

Key words: • App • Digital • Prevention • Self-Care

“Complete brilliance! My 12-year-old daughter has a co-ordination condition and she totally loves this. In her words, ‘anyone who can design an app that makes me brush my teeth (properly) without a hissy fit is a genius!’”

Parent
Free epilepsy risk management and prevention tool, enabling patients to self-monitor via a digital app.

Summary
EpSMon can be used as a self-management tool by providing risk assessments to patients and encouraging early intervention for people with rising risk. EpSMon informs of changes to risk factors by patients monitoring their seizures and well-being, and encourages seeking medical help if required. EpSMon is a digital version of a SUDEP (Sudden Unexpected Death in Epilepsy) and Seizure Safety Checklist, developed and available for professionals who register with SUDEP Action for annual updates from a UK-wide development group of experts.

Challenge
Over 600,000 people in the UK live with epilepsy; yet 21 of these die every week. People with epilepsy have a 24 times higher risk of sudden death than the general population, although 42% of these deaths are considered potentially avoidable if patients are informed of risks and supported to make changes. A preventative tool such as EpSMon can have a significant impact on the personal and financial costs of epilepsy through reduction in deaths and decrease in A&E appointments.

Impact
- EpSMon can help reduce the £1.5 billion in costs associated with epilepsy within the UK every year
- Adopted as a solution via a training package for emergency services, and also promoted by Royal College of GPs e-learning
- Evaluated as part of a 2017 NIHR Cochrane Review of epilepsy technologies

“I think EpSMon is a brilliant, friendly and nicely-designed app. It is a positive tool and I feel empowered in the way it encourages me to be active in self-monitoring. It asks direct questions which really help me consider how well I am looking after myself in order to avoid risks of seizures. It reminds you to do a three-monthly check-up and to make appointments with your doctor or neurologist when you don’t want to face up to how your epilepsy is affecting you.”
EpSMon User

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Key words: • App • Epilepsy • Patient Safety • Risk Reduction • Self-Management
Six-week group programme delivered to people aged 45 plus with Osteoarthritis (OA).

Summary
Enabling Self-management and Coping of Arthritic Pain through Exercise, or ESCAPE-pain, is a six-week programme delivered to groups of ten people, aged 45 years or older, with knee and/or hip OA. It helps people understand their problem, advises them what (not) to do and teaches simple exercises that can alleviate pain; allowing them to do more, change the course of the condition and improve their lives. Behavioural change techniques - including goal-setting, action/coping planning, monitoring - are incorporated to encourage participants to maintain a healthy body weight and exercise regularly.

Challenge
OA affects nearly ten million people, causes pain, reduced mobility, impairs physical, mental and emotional wellbeing, independence and quality of life, and increases risk of co-morbidity and mortality. 90% of people with OA are managed by GPs. It accounts for two million GP consultations, prescription medication, an estimated 150,000 knee/hip replacements, and is the third largest NHS expenditure.

Impact
- ESCAPE-pain is shown to reduce pain, improve physical function, depression, health beliefs and general well-being in randomised control trial (RCT)
- Sustained benefits for up to two and a half years after completing the programme
- £2.8 million annual savings in total health and social care for every 1,000 participants who undertake ESCAPE-pain

Key words: • App-Supported • Implementation Support/Advice • Self-Management • Service

“...I have benefitted 100% from the class. My right knee is much improved and I have a training programme to help me with the rest of my life.”
Patient
Skills development programme for health professionals, and tools to empower people to self-manage, become more active in their care and adopt healthier behaviours.

Summary
Health Coaching is:
- A two-day, four-day (accredited) and ten-day (train the trainer) training and organisational development (OD) programme
- A social movement and free implementation toolkit for organisations and systems

Based on behaviour change science, health coach training equips clinicians with new mindsets and skills that help people gain the knowledge, skills and confidence to become more active participants in their care. It is a person-centred process, effectively used by all professionals (and peers). It is applicable to all long-term conditions; improving outcome, patient and clinician satisfaction, lifestyles, decision-making, self-management and medication compliance.

Challenge
A paradigm shift is needed in how professionals communicate with patients, as society, medical care and technology has revolutionised, and non-communicable diseases come to dominate. Reportedly, half of patients leave their doctors not understanding what they have been told; only 10% of people act on lifestyle advice and under half take their medications correctly; only 40% - 60% of people are sufficiently involved in decisions about them; communication is a major source of complaints; and time-strapped clinicians are struggling to manage expectations. A shift from ‘telling’ to ‘enabling’, and more tailored conversation is required to engage and empower patients to self-manage.

Impact
- Robust international evidence base including 12 systematic reviews
- Over 4,000 clinicians trained to date and 58 local trainers
- More than 96% of clinicians reported good or very good learning opportunities and application to their work
- Two thirds of clinicians are still using the skills after one year, with local trainers continuing to train after four years
- Savings of £3.6 million per annum achieved in acute rehabilitation team training and £12,500 per annum in reduced physiotherapist follow-up appointments

Key words: • Long-Term Conditions • Patient Empowerment • Prevention • Self-Management • Training

“This training was more enlightening and useful than any other ‘communications’ type training that I have attended in my 30 years in nursing. These are essential skills for NHS staff with the current demography and client base.”
Heart Disease Specialist Nurse

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FELLOW
Matt Jameson Evans

Improve population self-management with an easy-to-implement digital social prescription tool that signposts online and local offline support, that is shown to improve patient activation.

Summary
HealthUnlocked is the world’s largest social network for health covering more than 120 health conditions, over 700,000 members and five million users every month. The network is built on 250 partnerships with UK health charities who administer online peer support and help users navigate patient services. The platform matches people with people, people with organisations and people with useful non-statutory services. An academic study found that use of the platform increases patient engagement and activation in their health.

Challenge
HealthUnlocked provides an easy to implement digital social prescription tool allowing professionals to signpost people with chronic conditions and specific health needs to quality self-care services based on a person’s location, CCG and condition. The tool can be a self-service tool for patients, integrated into local websites and also integrates directly into EMIS. The tool signposts NHS and social care services, charities and voluntary sector services, and world-class online peer support communities on HealthUnlocked.com.

Impact
- 31% of people moved from a low health activation level (PAM) to a high one after three months of using HealthUnlocked
- People staying away from GPs increases 47% and visiting A&E drops by 30% over three months
- 27% of people go to the doctor less because of the information they got from HealthUnlocked
- 77% of people have more confidence in managing their own health after coming to HealthUnlocked
- 63% of people had never met someone else with the same health condition as themselves before coming to HealthUnlocked

*Source: Patient Activation Study (PAM) by Manchester University (2017) and HealthUnlocked User Survey (2017)

“One in four people in hospital beds in our Borough have dementia and 66% of people with dementia are supported by unpaid carers. We believe that our collaboration with HealthUnlocked and their work with EMIS integrating social prescribing into the GP record, will help social prescribing take centre stage and help people live happier, more independent lives, reducing the strain on carers and the health system. We are already seeing how popular the system is with GPs themselves.”

John Craig, Chief Executive of Care City Test Bed

Key words: • Digital Signposting • Patient Activation • Prevention • Self-Management • Social Prescription
Low-cost, scalable, comprehensive online self-management platform for people with diabetes.

Summary
My Diabetes My Way (MDMW) incorporates multimedia education (around 200 resources), online health record data access, personalised tailored data-driven advice, communication tools for healthcare professional contact, and links in to social media and peer support. MDMW currently has over 32,000 registered users. Running across NHS Scotland since 2008, MDMW education sites have recently been launched commercially in Somerset and north west London.

Challenge
Diabetes is a growing health problem affecting 9% of the global population. Diabetes spending will consume around 17% of the NHS budget by 2025. People with diabetes only spend a few hours per year with healthcare professionals. The rest of the time they self manage.

ePatient education, empowerment, feedback, motivation and flexible access to healthcare staff can reduce costly long-term complications, clinic visits, hospitalisations and death, allowing people to live longer and healthier lives with reduced care costs.

Impact
- 90% of users felt MDMW helped them to manage their diabetes better*
- Improvements in long-term blood glucose sustained out to three years (based on large case control study)
- Over 6:1 return on investment (ROI) based on analysis of outcome data from long-term user in NHS Scotland

*Based on evaluation survey of 1,098 users

“I am much more in control of my condition, but importantly, I now understand the goals that I should be achieving and am able to have a constructive discussion with my consultant. This patient access through My Diabetes My Way is an outstanding achievement in the care, education and involvement of people with diabetes.”
Patient

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Key words: • Diabetes • Digital App • IT Platform
myCOPD is one part of a long-term condition patient app. It can be used on almost any device and assists people with COPD to self-manage their condition more effectively, while enabling clinicians to monitor and manage patients remotely at reduced cost.

**Summary**

myCOPD enables patients to manage their condition more effectively with a self-management plan and inhaler diary, pulmonary rehabilitation program, online education tutorials, weather, pollution, and symptom reporting. myCOPD empowers patients to take more control of their own care. This brings significant improvements in inhaler use and technique, reduces exacerbations, and raises the current low levels of compliance with treatment.

The platform interfaces with a clinician-facing dashboard to enable the remote monitoring and management of patients at an individual and population level. Local healthcare providers use the platform to monitor exacerbation burdens in real time, review potential inequalities in health care, more effectively plan support services and deliver a co-scripted annual review. myCOPD is just one part of the my mHealth long-term condition platform for patients with Asthma, Diabetes, Heart Disease and COPD.

**Challenge**

Chronic Obstructive Pulmonary Disease (COPD) causes 115,000 emergency admissions and 24,000 deaths per year, 16,000 of these deaths occur within 90 days of admission. 835,000 people in England are currently diagnosed with COPD, with a potential 2.2 million undiagnosed. Treatment is complex, with an expanding range of different inhaler devices entering the market. Most patients have an inhaler, but 90% do not use them correctly, affecting the dosage they receive. Compliance with treatment is often extremely low, leading to poor outcomes and wasted prescribing. For this reason, improving self-management for patients with COPD is a key priority for the NHS. As COPD has no cure, it is essential to stabilise disease and prevent recurrent flare-ups or exacerbations. Exacerbations often require intensive treatment and can be severe enough to require hospital admission. Access to PR services in many areas is poor and limited, and many patients find access to PR classes difficult.

**Impact**

- myCOPD has proven to correct 98% of patient inhaler errors without clinical involvement
- myCOPD doubles the rate of recovery from acute exacerbations
- myCOPD, in a head to head RCT, has been shown to deliver the same outcomes as class-based Pulmonary Rehabilitation classes
- A CCG with an average COPD population of 5,000 patients would expect to make savings in the first year alone of over £200,000 if deployed to 60-80% of their COPD population
- myCOPD’s PR service costs £20 for the lifetime of a patient, versus current NHS costs of £400-£800 per six-week course
- myCOPD reduces the time to deliver the annual review in primary care by 75%
- myCOPD is available on the 2017-2019 Innovation and Technology Tariff (ITT)

**Key words:** eHealth • Medicines Management • mHealth • Patient Apps • Self-Management

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**“Since I started using myCOPD, I have lost weight, my depression has lifted, and I see my GP just once a year (compared with twice-monthly visits previously). I have not needed hospital treatment for 18 months.”**

Patient

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**Simon Bourne**

FELLOW

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A fully remote, technology-enabled programme of type 2 diabetes structured education and behaviour change, combining one-to-one support from a registered dietitian with evidence-based online educational materials and use of the Oviva app.

Summary
Oviva Diabetes Support is a fully remote, QISMET-accredited programme of structured education and behaviour change for people with type 2 diabetes. The programme provides participants with weekly one-to-one coaching from a specialist dietitian over ten to 12 weeks, to support behaviour change and develop sustainable self-management strategies. Dietitian coaching is supported by highly engaging evidence-based structured education materials for self-study, and participants can use the Oviva app to self-monitor progress against goals, maintain a food diary and communicate securely with their dietitian.

Challenge
Diabetes costs the NHS over £10 billion per year, of which 80% is spent on treating complications which could be prevented through good diabetes management. Structured education and guided behaviour change are crucial to help people self-care and reduce risk factors. However, the National Diabetes Audit and research indicates that uptake of traditional group-based, face-to-face structured education programmes is poor, and the impact on clinical outcomes and complication rates limited.

Impact
• Average uptake of 75%, with 85% of participants completing the programme
• Clinically meaningful improvements in diabetes treatment targets, as demonstrated by outcome data (including average 13mmol/mol reduction in HbA1c and 6kg body weight loss at six months programme completion)
• 96% of participants ‘extremely likely’ or ‘likely’ to recommend Oviva Diabetes Support to friends or family
• Estimated NHS savings of £1,000 per participant based on reduced medication need and service utilisation

Using the app and the feedback allowed me to make changes to my eating habits. I felt in charge of these changes and the coaching allowed me to set reasonable goals and achieve them. I have no hesitation in recommending Oviva – it worked for me!”

Patient

Key words: • Behaviour Change • Digital • Early Intervention • Prevention • Structured Education
FELLOW
Anne Bruinvels

When I received the diagnosis of breast cancer, my world was turned upside down. In addition to treatment plans, examinations and results, there was so much anguish and sadness. OWise creates order in this chaos and keeps it that way. It is truly a fantastic support!

Patient

Smartphone app offering people with breast cancer personalised medical information, enabling them to record their experiences in real time.

Summary
OWise is the first mobile app and website to offer people with breast cancer personalised medical information throughout their treatment. OWise allows people to record in real time their experiences, including side effects and overall quality of life, and collates - for research purposes - fully anonymised patient reported outcome (PRO) data with a view to improving clinical outcomes for cancer. Patients can also receive information about their condition and wellbeing as well as helpful tips on topics to discuss with their doctor. This empowers patients and helps create a platform for personalised treatment.

Challenge
When diagnosed with cancer, a person’s life is turned upside down. There is a lot of anxiety and confusion about the treatment, the outcomes, how to cope and even survive. Often the patient-doctor dialogue is not ideal, leading to a sub-optimal patient experience. Clinicians and prescribers also lack accurate PRO data to manage the patient’s treatment-related toxicities and side effects. Because of the pressure in the NHS, patients often under-report their side effects leading to avoidable hospitalisations.

Impact
- Over 1,000 downloads of the UK version of the app
- Actively recommended by a number of clinical centres, including University College London Hospitals (UCLH), Brighton and Sussex University Hospitals, Royal Marsden Hospital, Royal Liverpool Hospitals, Taunton and Somerset NHS Foundation Trust
- 90% of medical professionals would recommend OWise to patients (Journal of Medical Internet Research - Cancer, 2016)
- Use of an e-PRO tool like OWise may increase quality of life (from 18% to 34%) and result in a five-month overall survival in advanced cancer patients (Basch et al. JAMA 2017)
- Potential cost saving of £3,462 per user for each quality adjusted life month (York Health Economic Consortium, 2017)

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“When I received the diagnosis of breast cancer, my world was turned upside down. In addition to treatment plans, examinations and results, there was so much anguish and sadness. OWise creates order in this chaos and keeps it that way. It is truly a fantastic support!”

Patient

Key words: • Cancer • Mobile App • Patient Empowerment • Patient Reported Outcomes • Toxicity Management
Technology platform allowing patients to own a copy of their health and care information, enabling true citizen-led care, improving outcomes, efficiencies and generating direct cash savings.

Summary
Patients Know Best (PKB) enables patients to own a copy of their health and care information in a single record to share with whoever they trust, wherever they receive care. It is securely hosted on the NHS HSCN (N3) network, and all data is encrypted but accessible on any web-enabled device at any time. This single record puts the patient at the centre of their care, empowering their entire health network to share information about a patient with the patient. This allows care coordination, delivery of online digital services, and self-management, whilst ensuring improved clinical outcomes and direct in-year cash savings.

Challenge
The NHS has faced major legal, technical, financial, ethical and practical challenges in its attempts to electronically share patient information among all relevant stakeholders. Many approaches have been based on attempts to link disparate systems and have focused on organisations, institutions or geographical areas rather than the patient. Attempts to include the patient have often come later, adding complexity to an already fragmented system. The solution is a citizen-centric approach which copies all information held on record, and gives ownership and control to the patient.

Impact
- Shown to reduce unplanned GP appointments post-surgery by 28% and improve patient activation in 64% of patients using the system
- Can save an average acute hospital £800,000 per year in direct cash savings by sending correspondences electronically
- Over one million records have been created in PKB, which is receiving 500,000 clinical data points per week
- Currently delivering the largest shared care record programme in the UK (the Care Information Exchange that will empower 2.3 million citizens across north west London) - and other large scale deployments, including a national programme in Wales

“...had a huge impact on my daughter’s life. It really equipped me to manage my daughter’s care efficiently. If I turned up to an A&E department or to another hospital, I could tell them my daughter’s haemoglobin is at 68 and she needs a transfusion, and they would believe me because I wasn’t just saying it. I had the official hospital record on my phone from a portal they could trust. It empowered me and it made my interactions with the doctors more efficient.”

Parent

Key words: • Digital • Patient Empowerment • Patient Records • Self-Management • Shared Care Records
Digital sleep improvement programme (available via web and mobile), clinically proven to help overcome even long-term poor sleep.

**Summary**
The gold standard approach to insomnia treatment is a talking therapy called Cognitive Behavioural Therapy (CBT). CBT involves learning cognitive techniques to address the ‘racing mind’, and behavioural strategies to help re-set sleep patterns naturally. Sleepio uses the latest digital technology to deliver the ingredients of CBT for insomnia in a fully automated, scalable, yet personalised way. Users are guided through a series of weekly interactive sessions by The Prof, a virtual sleep expert, and his narcoleptic dog, Pavlov. Sleepio is clinically proven to help overcome the worry and negative emotions that accompany the experience of being unable to sleep.

**Challenge**
Sleep is essential to good health. Around one in five adults suffer from chronic insomnia: difficulty falling asleep, staying asleep or waking feeling unrefreshed. This has profound negative impacts on quality of life by impairing memory, productivity, self-control and emotional wellbeing, as well as directly increasing the risks of physical ill health. Sleeping pills are widely used; drugs prescribed to treat poor sleep cost the NHS over £72 million per year. Yet sleeping pills often have harmful side effects and do not address the root causes of insomnia. In person CBT for insomnia is rarely available on the NHS. Sleepio delivers clinical outcomes comparable to in-person therapy.

**Impact**
- Evidence for Sleepio includes six published randomised controlled trials (RCTs) and over 20 peer-reviewed papers, based on over 4,000 people (www.bighealth.com/outcomes)
- The cost of Sleepio accounts for less than 37% of the cost of six sessions of in-person CBT (according to NICE Health App Briefing)
- Routine data shows that Sleepio is exceeding national targets for recovery from common mental health disorders - 68% of anxiety and depression patients using Sleepio moved to recovery, versus a national target for IAPT interventions of 50%
- Multiple global employers now offering Sleepio as a benefit owing to evidence that Sleepio improves both health and productivity outcomes
- Sleepio is partnering with Good Thinking, London’s Digital Mental Wellbeing Service, to improve sleep and mental health for NHS patients across London

“I've had quite bad sleeping problems for a number of years, and not much I have tried in the past has helped... the Sleepio course has really helped me out - I can’t recommend it highly enough. [It’s] a very well thought out and structured, practical programme which has helped me deal with something that has plagued my life for years - which has been pretty tough at times.”

Mr Richardson, Patient

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**Key words:** • App • Digital Medicine • Insomnia • Mental Health • Sleep
SUPPORTING NEW MODELS OF CARE
Population health intelligence solution utilising multi-dimensional risk analytics to provide insight to support system planning, evaluation, care co-ordination, cohort identification and intervention tracking.

Summary
ArtemusICS is a population health intelligence solution, collating data from GP, acute, community, social, mental, ambulance and remote care settings. ArtemusICS enables commissioners to assess the needs of local populations, identify gaps in care and impactable pathways, view trends, prioritise care delivery and monitor the impact of early intervention and prevention initiatives, including telehealth supported interventions. Supporting community and multidisciplinary teams to identify and keep patients out of hospital, stopping preventable A&E admissions and in-patient stays through earlier detection and intervention.

Challenge
Intelligence about the prevalence of disease, population needs, and utilisation of public services across a population is vital to delivering a truly integrated and holistic service, reducing inequalities and optimising care. True integrated care for each patient requires an integrated view of each patient. There is a need to provide targeted, cost-effective interventions and real-time tracking of intervention outcomes in order to focus sparse clinical resources on specified cohorts of patients.

Impact
- Identify specific patient cohorts (risk, conditions, end of life, frailty, social isolation)
- Identify integrated care needs of cohorts and individual patients
- Identify gaps in care
- Measure efficacy and return on investment (ROI) of interventions
- Understand predicted and actual costs

"Partnership working with Docobo has helped Crawley CCG, and Horsham and Mid Sussex CCG develop and enhance the functionality of integrated data sets in the ArtemusICS for targeted patient care. Recent addition of end of life and mental health modules has huge potential to provide the intelligence for not only collaborative care but also effective and efficient care across the provider structures."

Bharti Mistry, Crawley CCG

Key words: • ACS/STP Enabler • IT Platform • Outcomes • Population Health • Quality Improvement
An NHS service putting the patient at the heart of their own care, using an innovative digital platform enabling multidisciplinary care planning for all patients who need urgent care.

**Summary**
Coordinate My Care (CMC) has been developed to give people an opportunity to create an urgent care plan where they can express their wishes and preferences for how and where they are treated and cared for. This care plan can be shared electronically with all the healthcare providers working around the patient, ensuring they are referring to one ‘single version of the truth’ without the need for repetition or any misinterpretation of the patient’s situation or needs.

**Challenge**
A GP surgery is only open for 30% of a patient’s week, so 70% of the time patients are treated and advised by other healthcare professionals who do not know them. This can lead to a lack of continuity and coordination of care, particularly out of hours, and can mean that urgent care delivery feels fragmented and impersonal to patients, and their families and carers. CMC empowers the multidisciplinary team around the patient to work more effectively together 24/7 and deliver patients the care they want. CMC reduces unnecessary hospital admissions and thus relieves A&E crises.

**Impact**
- More than 46,000 care plans created to date across London
- 76% of CMC patients have died in their preferred place
- 19% of patients with a CMC plan die in hospital, compared to 47% nationally
- CMC is saving the NHS around £2,100 per patient, equating to an annual saving of over £16.8 million in London
- mycmc - the CMC patient portal enables patients to initiate an urgent care plan
- NHS 111, out-of-hours GPs, and the London Ambulance Service are increasingly viewing care plans

“CMC has been a paradigm shift for our staff and has changed the way we treat patients for the better.”
David Whitmore, London Ambulance Service

**Key words:** • Advance Care Plan • Coordinated Care • Digital • Patient-Centric • Urgent Care
SUPPORTING NEW MODELS OF CARE

NeuroResponse

Model of care which digitally connects people with long-term neurological conditions to their primary and specialist care teams to receive timely advice, supported by a rapid diagnostics and treatment pathway.

Summary

NeuroResponse combines technology, humanity and quality to improve the lives of people with long-term neurological conditions (LTNCs). This co-designed unique model of care is centred on digital technology and addresses current fragmented care pathways. NeuroResponse offers access to expert neurology advice, shorter waiting times for assessment of symptoms, early detection of infection, faster access to treatment, and intelligent, secure information sharing. As a collaborative solution, NeuroResponse generates improved clinical outcomes, lowers utilisation of health resources compared to existing NHS services, and reduces avoidable spend, which annually consumes £43 million of NHS budget for unplanned admissions for people with Multiple Sclerosis (MS) alone.

Challenge

LTNCs are increasingly common. A distressing, frequently associated health issue is urinary tract infections (UTIs). Across the 107,000 people living with MS in the UK, UTIs cause 14% of unplanned admissions, which annually cost the NHS an estimated £43 million. NeuroResponse aims to reduce unwarranted variation and bring care closer to home so that people and families living with LTNCs feel supported at all times.

Impact

- Relapse teletriage component increases patient health state utility values by 0.15 as measured by EQ5D5L
- Since implementing NeuroResponse for a small sample (N=5) of people with complex MS needs and a history of frequent unplanned admissions for UTIs, three out of five had urinary infections identified and treated within their home settings and none have had a UTI-related A&E presentation
- The long-term triple aim of NeuroResponse is: improving patient experience, reducing costs, and improving population health.

“**This is a great service, so well designed, I wish we had it last month - might have stopped me going to hospital.**”

Patient

Key words: • Admission Avoidance • Early Intervention • Long-Term Neurological Conditions • Model of Care • Specialist Triage

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@NeuroResponse
Outcomes Based Healthcare’s population health analytics platform measures ‘true’ health outcomes in near real time.

**Summary**
OBH’s Outcomes Platform enables commissioners and providers to segment populations, identify baselines for their selected outcomes, set improvement trajectories and monitor outcomes specific to their local populations on an on-going monthly basis. Outcome sets, designed by OBH, typically measure both the presence of health and the avoidance of illness. By encouraging commissioners to pay providers based on improvements in patient outcomes, health systems are incentivised to combine new and existing care activities to keep patients well.

**Challenge**
OBH has developed a population health analytics platform that measures ‘true’ health outcomes that matter to people and segmented populations, in near real-time. OBH supports commissioners, providers, and health care systems to organise care around these priorities, measuring the resulting health outcomes. The key focus for OBH is to shift measurement and reimbursement away from solely treating illness, towards improving people’s health, by establishing capitated budgets, and payment for prevention.

**Impact**
- Diabetes, Respiratory and Whole Population implementations agreed via G-Cloud in south west England, across four CCGs
- Approximately 6% of population in England now benefitting from OBH Outcomes Platform as of December 2017
- Whole Population implementation agreed in north east England
- Commissioners now able to reimburse providers for adverse outcomes which have been avoided
- Preparatory work supporting outcome measurement and baselining in leading ACS region in East Midlands

Dr Jonty Heaversedge, Chair of Southwark CCG, Medical Director for Primary Care and Digital Transformation, NHS England (London)
NHS Innovation Accelerator: A partnership initiative

NHS England

NHS England’s primary aim is to improve health outcomes for people in England. NHS England sets the direction and priorities for the NHS as a whole, allocates funding to England’s GP-led clinical commissioning groups, and directly commissions primary care, specialised services and healthcare services for offenders.

Academic Health Science Networks (AHSNs)

The two key objectives of the AHSNs are to improve health and generate economic growth. They do this through connecting academics, NHS, researchers and industry to accelerate the process of innovation and facilitate the adoption and spread of innovative ideas and technologies across large populations.

All 15 of England’s AHSNs are formal partners in the NHS Innovation Accelerator (NIA) and provide a contribution towards the cost of the bursaries offered to each of the Fellows.

Eastern AHSN: www.eahsn.org
East Midlands AHSN: www.emahsn.org.uk
Greater Manchester AHSN: www.gmahsn.org
Health Innovation Network: www.healthinnovationnetwork.com
Imperial College Health Partners: www.imperialcollegehealthpartners.com
Innovation Agency (AHSN for the North West Coast): www.innovationagencywnc.nhs.uk
Kent, Surrey, Sussex AHSN: www.kssahsn.net
North East and North Cumbria AHSN: www.ahsn-nenc.org.uk
Oxford AHSN: www.oxfordahsn.org
South West AHSN: www.swahsn.com
UCLPartners: www.uclpartners.com
Wessex AHSN: www.wessexahsn.org.uk
West Midlands AHSN: www.wmahsn.org
West of England AHSN: www.weahsn.net
Yorkshire & Humber AHSN: www.yhahsn.org.uk

UCLPartners

The NIA is hosted by UCLPartners, an academic health science partnership that brings together people and organisations to transform the health and wellbeing of the population. Working in partnership and at pace, its members from the NHS and higher education support the healthcare system serving over six million people in parts of London, Hertfordshire, Bedfordshire and Essex. Crucially for the NIA, UCLPartners works in partnership with all other AHSNs across England.