

Data driven healthcare – Digital diagnostics and new methods for improved patient safety

By Angela Gallego, Mat Key and Keith Errey of Isansys Lifecare Limited.

Background - The Patient Status Engine

The Patient Status Engine (PSE) is a complete end-to-end patient digitisation and monitoring platform that continuously and wirelessly captures, collects, interprets and securely stores vital sign and other physiological data. It integrates a range of unobtrusive wearable sensors, gateways, network connections and back end IT and provides real-time data for novel predictive and diagnostic algorithms.

Support from the SBRI has enabled the PSE to be extensively improved, upgraded, and re-engineered for cost reduction. Intended use is now extended to paediatrics and patients at home and new wearable devices include a continuous temperature monitor and (shortly) a new pulse oximeter that, when synchronised to the Lifetouch cardiac sensor, will enable continuous ambulatory blood pressure measurement.

Solution requirements

Patient safety is a large, complex and multi-dimensional problem; there is not one single solution and certainly no magic bullet. A powerful starting point however is to know the status of patients at all times and better still, be able to predict the trajectory of a patient's status at some point in the future. Clinical teams will need to develop new care pathways that are proactive rather than reactive.

For this, key requirements are:

- Monitor patients better – more frequently and more accurately
- Record the history of all the observations for all patients
- Calculate early warning scores for all patients on critical care pathways
- Make it simple, low cost, and automatic
- Faster diagnostics and response to treatment indicators
- Provide this information on fixed and mobile dashboards

Digital diagnostics and biomarkers

The Patient Status Engine platform offers the means to meet these key requirements. The continuous, highly accurate and inherently digital patient data provided by the PSE is enabling clinical teams to develop new data-driven physiological diagnostics and biomarkers to inform new care pathways that are expected to lead to significant improvements in patient safety and better outcomes.

Current examples include:

- Personalised, self-learning early warning score for paediatric patients that recognises the wide spread of "normal" physiology in children, particularly neonates and infants. (Birmingham Children's Hospital)
- A rapid, low cost new physiological biomarker to replace current lab based tests in determining the status of advanced liver disease patients. This will allow a new at-home pathway to reduce hospital admissions (and costs) and improve patient quality of life. (UCL/Royal Free Hospital, London)
- A multi-vital sign physiological early-warning indicator of sepsis in chemotherapy patients at home to allow community based intervention and avoid hospital admissions. (Queen Elizabeth Hospital, Birmingham)
- A quantitative, heart rate variability based indicator of recovery (or deterioration) in post-operative cardiac surgery patients. (Care Hospitals, Hyderabad, India)

Isansys Lifecare is a new generation healthcare company that provides patient surveillance and monitoring services built on an innovative, low cost and scalable platform.

We work with a number of hospitals in the NHS and other leading healthcare professionals and institutes to deliver new patient monitoring technologies and methods to improve patient safety, achieve better patient outcomes and increase efficiencies.

Based on its scalable wireless sensor technology, Isansys' 'Vitals as a Service' clinical solution provides continuous real-time information for automated patient surveillance, for early warning scores and track and trigger indicators, and for predicting adverse events.

www.isansys.com

The Small Business Research Initiative for Healthcare (SBRI Healthcare) is an NHS England initiative, championed by the newly formed Academic Health Science Networks (AHSNs), who aim to promote UK economic growth whilst addressing unmet health needs and enhancing the take up of known best practice.

Part of Innovation Health and Wealth the SBRI Healthcare programme sets industry the challenge in a series of health related competitions which result in fully funded development contracts between the awarded company and the NHS. Unlike many R&D projects which offer grant or match funding, SBRI contracts are 00% funded and the company retains the IP.

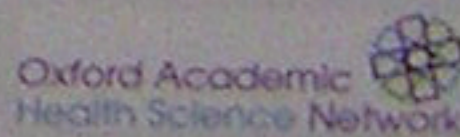
www.sbrichealthcare.co.uk



Academic Health Science Networks (AHSNs) have a unique opportunity to bring together clinical research, informatics, innovation and training and education, with healthcare delivery to improve health outcomes and raise quality and value through large-scale, sustainable change.

The Oxford Academic Health Science Network covers a population of 3.3 million across 4 counties where the NHS spends £5bn a year and employs 65,000 people. The Oxford AHSN area is also home to many major international companies and over 300 life science businesses. In addition it covers 12 Clinical Commissioning Groups, four Local Enterprise Partnerships and 12 local authorities – as well as 10 NHS Trusts and 9 Universities.

www.oxfordahsn.org



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Monitor



Quantify



Discover



10%
figure of harm happening to admitted patients is well known.

Zero harm should be the target.



UK Case records reviews:

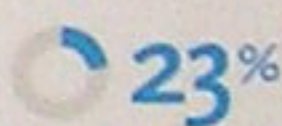
2014

1.2 million reported care incidents.

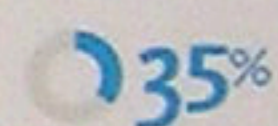
2013

850,000 reported adverse events.

Hospitals in England and Wales:



23%
deaths from potentially avoidable causes.



35%
of outpatients experience an adverse drug event.

2012



Adverse events cost the UK:

£2.5 billion
in extra hospital days.

£1.2 billion
paid in clinical negligence.

2013



1 in 10 patients may be harmed while in hospital.

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Isansys Lifecare Limited
8C Park Square, Abingdon, Oxfordshire OX14 4RR.
+44 1235 430225 – info@isansys.com

Continuous care – Anywhere