Achieving Digital Excellence in the NHS

A Strategic Analysis of Digital Transformation Projects in the NHS

March 2017

A high-level policy publication recognising excellence in healthcare digital transformation projects and strategies, from across the NHS, with a view to encouraging rapid adoption and replication of technology-enabled services by other NHS organisations.

Table of Contents

Executive Summary

A high-level policy publication recognising excellence in healthcare digital transformation projects and strategies, from across the NHS, with a view to encouraging rapid adoption and replication of technology-enabled services by other NHS organisations.

"Achieving Digital Excellence in the NHS" is a publication series designed to showcase, and analyse, the very best of digital transformation projects from across the NHS. The report provides a compilation of exemplar case studies which discuss and evaluate projects where digital, connected and mobile technologies are having a substantial impact upon clinical, administrative and organisation processes.

Strategic decisions about digital transformation and the associated investment in information and digital technologies can all too often be a footnote to NHS board discussions. This report sets out existing opportunities to transform healthcare using proven digital technologies, providing essential insight into successful methods for the implementation of these technologies and an analysis of the benefits realised by those organisations furthest on the digital roadmap.

This series provides Senior NHS Managers, Digital Transformation Teams, Healthcare IT Managers, Clinical Planning Teams, CIMOs, CIOs and Healthcare Professionals with detailed case studies from existing digital projects with a view to disseminating best practice, shaping future policy, preventing development duplication, and encouraging rapid adoption of digital services.

Publication Priorities

» Showcase a detailed collection of digital project case studies/reviews from across different NHS organisations that demonstrate excellence in delivery

» Analyse project components driving success

» Understand strategic objectives and implementation policy

» Recognise lessons learnt, avoidable implementation problems, and challenges of implementation

» Analyse key project metrics (investment and resource requirements)

» Document ROIs and outcomes

» Highlight different technologies and the opportunities they present

Digital Transformation – Sharing Best Practice

The series is designed to provide key decision makers with access to case studies which capture barriers and facilitators to implementation of digital health from across the healthcare ecosystem. These are all examples of projects that have had extremely successful implementations and which are driving significant returns on investment for the organisations involved.

Providers are all facing the same financial and service delivery constraints whilst at the same time being asked to provide greater efficiency and standards of service delivery. Digital technologies are widely accepted as having a major role to play in this equation, and this regularly leads to duplication in terms of service redesign, care pathway transformation, digital integration and IT development projects. Shining a spotlight on the organisations that are leading the way in particular areas of digital transformation has the benefit of identifying those effective implementation methodologies and sharing lessons learnt from those deployments. Helping organisations to utilise resources more effectively and reduce the time to deploy digital technologies and services. ∎

Kodak Alaris Information Management

Kodak Alaris Information Management (IM) has worked with a number of NHS organisations, helping them in their journey to digitise healthcare records and improve patient care by making information accessible to clinicians in real-time.

Digital transformation is central to the Government's plans for transforming the NHS as it works towards achieving a paper-free health and care system by 2020. And for healthcare providers, embarking on a process that makes information more readily accessible and helps clinicians navigate through systems more efficiently, delivers much more than cost savings, it also makes for an improved patient experience.

Digitising the vast volume of healthcare records and storing them in an electronic format streamlines slow time-intensive manual processes and gets crucial patient information to the point of care automatically. The ability to instantly access a patient's entire medical history from a single point, leads to better care, less mistakes and greater productivity.

The cost savings associated with removing paper can be significant, enabling healthcare facilities to focus on innovation, growth and the future. Electronic storage is not only cheaper than the paper equivalent, it is also much more accessible and more secure. It puts an end to paper records being stored in a central storage area, with people wasting valuable time trying to retrieve them. Electronic filing systems also require less physical space, potentially freeing up more square footage that can be dedicated to clinical use.

WIDER EXPERTISE

Digital transformation poses a number of challenges in every business sector, and invariably making the shift from analogue to digital processes in the traditionally paper-intensive healthcare arena, can be a complicated proposition.

Electronic patient records and health information systems offer numerous benefits. By reducing paperwork, decreasing manual tasks and enabling a single patient view, they allow clinicians to focus on what matters most - the patient.

One of the biggest pain points facing the healthcare sector, an industry that has been traditionally reliant on paper, is a lack of experience in document capture and organisations are looking to partner with companies who can impart their knowledge and expertise to help them streamline processes.

Kodak Alaris IM has a strong heritage in the provision of tailored solutions to meet the full complement of customers' requirements within the healthcare sector. By bringing together the best science, technology, and partnerships, it has helped a number of NHS Trusts meet targets to digitise paper-based information, assisting them in driving internal

AINTREE UNIVERSITY HOSPITALS NHS FOUNDATION TRUST

Clinicians were concerned that finding case notes often took too long, delaying important information needed for patient consultations. This prompted the Trust to create a records management system that would provide easier and faster access to patient notes to help clinicians deliver the best possible care.

The Trust created an electronic medical records (EMR) system using CCube Solutions' electronic document management system (EDMS) with outsourced scanning services built around Kodak Alaris scanners and Kodak Capture Pro Software Network Edition (NE).

The EMR system has enabled the Trust to guarantee case note availability at the point of patient care, improve efficiency and reduce the costs associated with handling and storing paper records. Furthermore, the site once used for records storage has been repurposed as an Elective Care Centre, gradually freeing up an entire floor for clinical activities.

Aintree University Hospitals NHS Foundation Trust outsourced the task of scanning patient files to Capita TDS, who selected high performance Kodak Alaris scanners to keep up with the system's heavy workload. Anthony Lamb, Capita TDS Operations Manager said: "Kodak Alaris scanners are workhorses and the best choice for our demanding environment. They can handle large volumes and are extremely robust."

Capita TDS uses Capture Pro Software NE to process and manage documents and ensure the highest quality image first time, every time, the images and associated data are then sent via a secure FTP connection directly back to Aintree.
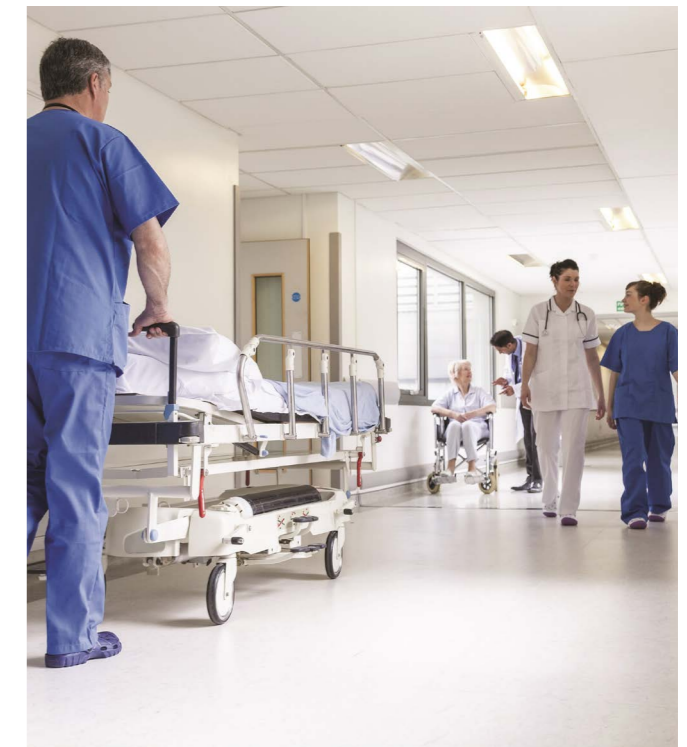
CAPTURE CONTENT AT THE DESKTOP

With an overriding goal to embrace the digital age in the most cost efficient and productive way, there is increasing demand amongst healthcare institutions for the ability to embed capture technology within existing line of business applications.
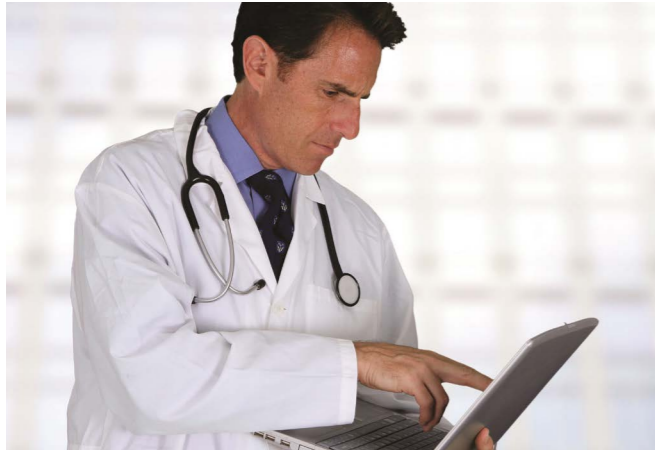
Clinicians faced with a myriad of hard copy documents such as referral letters, medical history, prescriptions, test results, medical charts and other accumulated patient information, are in many instances reliant on the back-office scanning function to capture the information and file it in the correct place, a process which inevitably takes time and can potentially be error-prone.

Kodak Alaris is able to put a capture button within a line of business application for healthcare institutions giving front-line medical staff the ability to capture relevant content at their desktop. Linking the capture function to line of business systems, removes complexity, instead of passing hard copy documents onto a third-party who is then responsible for scanning and filing in the correct place, a process which typically has a 24-48 hour lead time, the clinician can capture and file in real-time. This contributes directly to improved efficiency, eliminates the risk of information being lost or mis-filed and facilitates better sharing and collaboration among staff, right at the beginning of the patient's journey.

Empowering clinicians, enabling them to capture patient data at the source with transactional capture, dramatically improves efficiency around patient onboarding and registration.

efficiencies to enhance patient care, by improving the quality and accessibility of patient health records to clinicians across multiple sites and using a variety of devices.

With a long legacy in providing sophisticated solutions across all sectors, Kodak Alaris is well positioned to help healthcare providers on their journey to digital transformation by bringing best practice from other markets into the healthcare sector.

By leveraging its expertise in providing intelligent solutions to capture, recognise and extract, manage and securely exchange structured and unstructured medical information, Kodak Alaris clients are transforming processes, reducing costs and improving productivity.

BASILDON AND THURROCK UNIVERSITY HOSPITALS NHS FOUNDATION TRUST

Kodak Alaris IM helped Basildon and Thurrock University Hospitals NHS Foundation Trust complete an electronic medical records (EMR) system to digitise 450,000 patient records.

The EMR solution consisted of various components including Mobius medical records software from Fortrus, Laserfiche's EDMS2 , Adobe Livecycle workflow and eforms technology, with the actual notes scanned using both Kodak production scanners and ibml ImageTrac Lite equipment.

The project delivered savings totalling £1 million per year in reduced operating costs and £1.6 million per annum in improved efficiencies across the Trust.

ST HELENS AND KNOWSLEY TEACHING HOSPITALS NHS TRUST

Using Kodak Alaris scanners to drive unprecedented productivity, St Helens & Knowsley Teaching Hospitals NHS Trust was one of the first hospitals in the UK to stop using paper-based records in its daily operations. The Trust digitised over 135,000 medical records at its two hospital sites, St Helens and Whiston.

The Trust's primary objective was to improve patient safety and care by improving access to patient records and it also stated a desire to achieve cost savings across time and file storage. Partnering with Kodak Alaris helped the Trust achieve £1.4 million annual savings from a £1.2 million investment.

Capitalising on this experience, its IT resource St Helens Health Informatics Service (HIS), created its own in-house scanning bureau and achieved impressive results. In conjunction with partner CCube Solutions, it launched a fully managed service to digitise all Lloyd George records which General Practitioners keep in their surgeries. Costing just 60 pence per record per year, the service includes collection, digitisation, hosting, training and the software GPs then use to access the information on their desktops.

This initiative is about releasing more space in primary care, enhancing GP and practice staff productivity and removing a whole paper shuffling industry in primary care which in itself costs millions.

CASE STUDY
The Royal Free London NHS Foundation Trusts

Project overview
Kodak Alaris partner MISL, a UK-based bureau and BPO provider selected Kodak Alaris scanners to deliver a five-year, £4.5 million contract to provide document scanning services to The Royal Free, one of the most famous medical centres in the UK.

The project involved the digitisation of the hospital's entire medical records archive as well as ongoing day forward scanning of patient information as new clinical notes are created.

NHS client clinical/organisation objectives
The Royal Free's key objective was to digitise its medical records library in line with the Government's QIPP agenda, as well as improve patient care by providing clinicians with fast access to patient records at their fingertips.

Implementation timeline
A five-year implementation timeline to digitise 750,000 patient files, 300 million images, was set, however the work was completed two years ahead of schedule.

Project scale
Digitise 750,000 patient files, totalling some 300 million images within five years.

Project metrics
To meet the specific contractual requirements, MISL invested £500,000 - this included purchasing five high volume production Kodak i5600 and six Kodak i5800 Scanners, along with Capture Pro NE imaging software, hiring new staff and leasing a new building dedicated to the project.

MISL designed the project internally to function from a single, secure and dedicated industrial unit in Hoddesdon, Hertfordshire. The unit was fitted out to the highest security standards to incorporate the storage of documents pre- and post-scanning together with the production area. Security systems were installed together with two dedicated secure fibre optic data links to the Trust to enable the secure transfer of scanned data to The Royal Free's electronic document and records management (EDRM) system from Open Text.

Various SLAs depending on record type were agreed; for archive scanning, a five day turnaround from collection to image upload was agreed, two days for day forward scanning and two hours for Accident & Emergency records on receipt of files at the MISL bureau.

Robust disaster recovery plans to ensure business continuity were also put in place, processes were tested and performance was excellent, which provided MISL with total confidence that it could meet all its commercial commitments to the Trust.

In addition, MISL had to meet a 0.01% image failure rate target, which it achieved thanks to the performance of Capture Pro Software. This complete high to low volume batch capture software application, quickly converts batches of paper into high quality images, offers robust data extraction and seamless delivery to repository and business applications.

Client/user testimonials
"Digitising our medical records library is in line with the Government's QIPP agenda, Jeremy Hunt's challenge that Trusts should be paperlite and, of course, our desire to keep improving patient care. Fast access to notes via computers delivers this and means our clinicians now have patient records right at their fingertips."
Will Smart, Chief Information Officer, The Royal Free Hospital

"We upgraded to the latest Kodak Alaris scanners, we hit our agreed SLAs, minimised downtime, enhanced productivity and ensured we met BS10008 rules. Dealing with medical records is not like scanning invoices or bank statements. You're potentially playing with someone's life if there isn't the level of quality in the images scanned. It's very easy to forget this, which is why we wanted the best equipment to do the job."
MISL Marketing Director

"MISL has been sending us over 500,000 images per day which are loaded into Open Text and made available at the point of care for all clinicians."
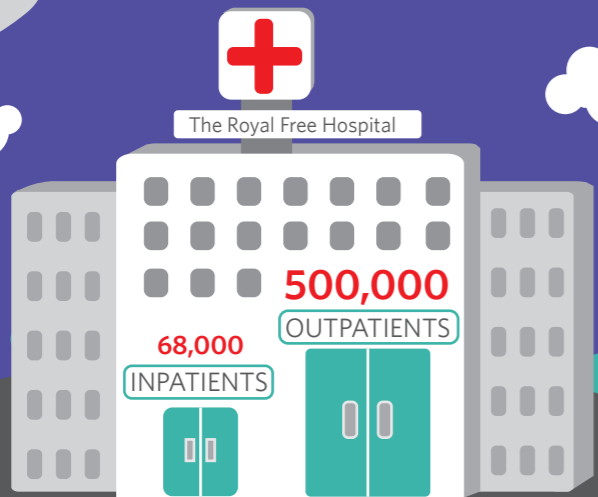*Alastair Crisp, EDRM Programme Manager, The Royal Free Hospital*

Outcomes/benefits
Powered by Kodak Alaris production scanners, MISL digitised The Royal Free Hospital's medical files in record time. The project was completed two years ahead of schedule thanks to a combination of investment in new technology which boosted the bureau's productivity by over 20%, new processes put in place and the hard work of staff. MISL's team worked 24 hours a day in three shifts, five days a week.

Given The Royal Free's focus on transplant patients, of which there are over 600, all of these records were scanned onsite using a Kodak i5600 Scanner, such is the importance of these notes.

For more information
www.kodakalaris.co.uk/go/IMnews ■

Kodak alaris

Powered by Kodak Alaris production scanners, MISL digitises The Royal Free Hospital's medical files in record time

The Royal Free Hospital

Located in **HAMPSTEAD**

68,000 INPATIENTS

500,000 OUTPATIENTS

750,000
Patient files digitised

Expected to take
5 yrs

Ahead of schedule
24 months

Totalling some
300m images

MISL purchased
5 Kodak i5600 production scanners

"MISL has been sending us over 500,000 images per day which are loaded into Open Text and made available at the point of care for all clinicians."

Alastair Crisp
The Royal Free's EDRM Programme Manager

MISL purchased
6 Kodak i5800 production scanners along with Kodak Capture Pro Network Edition imaging software

"Dealing with medical records is not like scanning invoices or bank statements. You're potentially playing with someone's life if there isn't the level of quality in the images scanned. It's very easy to forget this which is why we wanted the best equipment to do the job."

Steven Clarke
MISL's Marketing Director

Kodak alaris

"We've been working to tight timescales on data turnaround for The Royal Free Account, so the **20% gain** means we've been able to deliver the same **excellent quality data faster than projected."**

Steven Clarke
MISL's Marketing Director

20% Productivity gains

"MISL had to meet a 0.01% image failure rate target which it had done.

This is a testament to the performance of Kodak Capture Pro imaging software which incidentally also has no click charges – perfect for cost sensitive bureaus where paper processing volumes are huge."

Kodak Alaris' UK Sales Manager

Kodak i5600 scanners process
170 pages per minute

Kodak i5800 scanners process
210 pages per minute

Read the full article:
www.kodakalaris.com/go/royalfree

Extract insights

Capture content from digital and paper sources

Automate processes

Improve customer interactions

Make **Smarter** business decisions

We can **always** find a better way

Richmond GP Alliance Makes Quality Seven-Day GP Service a Reality

Implementation of Vision's interoperable solution is enabling safe and effective extended hours care for over 200,000 patients across Richmond

ENHANCING COMMUNICATION AND COLLABORATION ACROSS THE CARE ENVIRONMENT

What is needed to create Primary Acute Care Systems (PACS) is horizontal (between GP practices) and vertical (with other healthcare services) interoperability. This type of interoperability can be offered for the first time across primary, secondary, community care and emergency services via the new Vision Anywhere 2.0 app. The app enables registered clinicians to share knowledge, set tasks and book appointments across a multidisciplinary health and care team.

RGPA will be the first to adopt the new Vision Anywhere 2.0 app as part of their goal to improve accessibility for patients and improve efficiency for the NHS.

Grant Oliver IT lead at RGPA comments: "We've already seen clinical benefits from the extended hours scheme not only in the surgeries but across the CCG. The new app will allow us to explore ways to share the patient record with other care providers as appropriate, to further improve the healthcare of our local patients. I'm proud that Richmond is leading the way and hope we can become a best practice example for local collaboration."

Patient records from all 28 GP practices, 22 of which use Vision and six use EMIS Web, will be accessible via the app allowing read and write access to the medical records, repeat prescription management and GP appointment booking. It can be accessed 24/7 with or without WiFi and from any care setting. Clinicians working in A&E, NHS111, OOH, ambulances and urgent care centres will also be able to view patients' medical histories and add details of emergency encounters via the app on any device. This solution could therefore underpin collaboration across multiple care settings.

The aim of a seven-day service is the subject of much debate at all levels of the NHS. With the financial constraints, lack of resources and dwindling numbers of GPs bringing risk to the sustainability of the NHS; is aiming for a seven-day GP service the right thing to do?

Perhaps this goal is only intelligent and achievable through the use of technology. As the Wachter Review states, "The goal of digitisation of health systems is to promote what has become widely known as healthcare's Triple Aim: better health, better healthcare, and lower cost." The Richmond GP Alliance (RGPA), are a clear example where technology has been used to move towards these goals. They are currently able to offer a safer and more efficient 8am-8pm, seven day a week service due to Vision's shared-care solution being truly interoperable: different systems sharing data and being able to work together with no additional effort required by the user. Vision allows existing systems to talk to each other behind the scenes so that information from different systems can be presented as a single patient record with one search function. Benefits for the patient population, the GP practices and other health services across the area, including A&E, have already been seen. RGPA's use of Vision is therefore an example of a seven-day service, which is not only paperless, but is a safer, more effective and efficient delivery of healthcare.

The challenge of extending hours without interoperability:

In 2015, the GP Access Fund supported the 8am to 8pm seven day service in Richmond to meet the needs of the >205,000 registered patients and to align with the modernisation of the NHS. There were many encountered issues around the practicality of extending the hours of four selected hub practices with no extra staff recruitment and little extra allocated resource, to the point where healthcare professional buy-in to the scheme was difficult to come by. Issues related to consulting 'blind' (without access to patient history) meant the delivery of care outside of the patient's home practice was less safe and less efficient. There were also negative implications on practices' workloads from being forced to communicate via paper, post and fax.

Like many groups, patient record and appointment booking information could not be shared within the GP Alliance because they use multiple GP systems; 22 GP practices use Vision, six use EMIS Web. Commissioners were resistant to 'rip and replace' the systems due to technology costs, perceived risks of moving the data over, and the required training time and costs. Stretched clin-

ic staff also voiced how they have no time for extra training.

Richmond became the first with end-to-end GP integration:

Richmond's key goals were for any patient registered with a Richmond GP to have access to the appointments held in selected central clinics, known as hubs, and that the clinician will have full read and write access to the medical record of that patient following consent. After being selected as the technology of choice Vision worked closely with the RGPA clinicians to achieve their goals.

Grant Oliver, IT lead at RGPA comments: "The beauty of Vision is that as soon as the patient walks through the door, the clinician can find their medical history immediately, irrespective of what clinic they've come from. This reduces clinical risk and administrative time. The hub doctor can then write directly back to the patient record, which is again safer and saves time. This had never been possible before."

The Vision solution was simple to set-up; it took less than two months to install across all practices. All 28 are able to book both Dr and Nurse appointments from 8am to 8pm, seven days a week at any of the four hubs. Without any practices forced to change system, there is only one search required for all GPs and nurses to read and update any patient record. Letters, referrals and prescriptions are generated by the hub clinician as if they were in the "home" surgery and prescriptions can be printed as normal. Confidentiality issues were addressed and the Caldecott principles must apply (every proposed use of patient data should be defined and scrutinised).

The results to date have shown significant benefits to the patient, clinics and CCGs:

Over 650 extra patients are being seen per week across

the borough. In the first year since Vision's roll out, 16% of Richmond's population were seen in one of the four hubs. This shows how the scheme has given patients better access to primary care services through having the choice of multi-setting and extended hours. Due to the read and write access, the quality of patient care during these hub appointments should match highest standard patient pathway.

The Hubs rota maximises available resources to provide extended primary care hours so that each GP has a manageable workload and without huge extra recruitment or training of staff. CCG wide benefits have already been illustrated; there was a 25% reduction in Walk in Centre attendances in the first year. In the Richmond area, there has been a 0% increase in A&E attendance compared to 10% National increase. What may have caused this is the integration of the NHS111 service, where calls can be referred to the Hubs at weekends, instead of sending patients to Walk in Centres or A&E. This is an excellent example of where the use of technology has resulted in a more collaborative approach across the community.

Steve Marriott, Head of Marketing and Communications, Vision comments: "We're overjoyed that RGPA have embraced the collaboration made possible by Vision, and their clinical and patient population are now reaping the rewards. We work with clinicians to develop intelligent, interoperable solutions which are making the 'pipedream' of a safe, efficient and sustainable NHS a reality."

RGPA is ahead of its field in adopting a shared care solution. Despite the demonstrated benefits, there is much concern whether the Paperless 2020 aim is too optimistic and the Five Year Forward View is too unrealistic. Vision focusses on working with clinicians to create interoperable solutions which not only combat these national pressures, but which are tailored to the area and the patients' needs. ∎

Five ways Vision enables the Five Year Forward View

1. Fully interoperable electronic health records which are entirely paperless. Patient data is immediately accessible and can be updated in real-time, irrelevant of the hosting GP system, removing the need for paper-based notes and allowing clinicians to make well-informed, fast decisions.

2. Access to the shared care record facilitates a truly multidisciplinary approach where care staff in or out of the public health system can make informed decisions to provide the best possible care. This supports the NHS to make stronger, more credible and dependable local community partnerships.

3. Improves efficiency by removing administrative workload from out of date paper-based systems and duplicative actions as care staff are able to read and write the electronic shared care record; on mobile, on desktop, in clinic, remotely, online or offline.

4. Enables a Multispecialty Community Provider (MCP): Allows primary care services to extend into wider community-based NHS services by creating a robust governance structure around a network of GPs, nurses and other community health services, and a joined-up electronic health record for its registered population.

5. Through true interoperability Primary and Acute Care Systems (PACS) can be set up where general practice, community services and hospital services collaborate and communicate to put patients first through their complete treatment pathway.

Digital Footprints: Steps Towards Transformation in Paediatric Diabetes

Although the pursuit of digital excellence in the NHS continues, the adoption of technology across the health service remains, at best, patchy. Progress is undermined by a lack of both investment and, in some cases, clinical leadership to champion change. As we enter 2017, where sustainability and transformation are national watchwords, the NHS' ability to optimise technology will become crucial. Our challenge is to deliver sustainable and affordable high-quality services, and underpin them with efficient processes that drive health outcomes. On its own, technology is not the answer; but it's undoubtedly part of the solution. That's certainly the case at Southport & Ormskirk Hospital NHS Trust, where technology has played – and indeed continues to play – a central role in the improvement of paediatric diabetes services.

In 2011/12, Southport & Ormskirk's Paediatric Diabetes Unit (PDU) began an incremental programme of what's now widely called 'digital transformation'. Back then, our approach wasn't influenced by a national movement to adopt innovative tech, it was a common-sense response to an under-performing service in need of an overhaul. From a technology perspective, the transformation began with the introduction of Twinkle, an information management system designed to support paediatric diabetes care and capture data required for mandatory audit submission. Its deployment has provided a catalyst for year-on-year performance improvements against all the national quality standards for paediatric diabetes.

Today, Twinkle remains at the centre of an award-winning service that has since been bolstered by Diasend, a system that monitors patients' blood glucose in outpatient clinics, and a social media presence that's improving engagement between patients, parents and the multidisciplinary team (MDT). In the future, we hope to increase engagement further with Skype clinics for children and parents. Because for us, digital transformation is an ongoing pursuit; a journey not a destination. We literally go nowhere by standing still.

Our metamorphosis into a highly-regarded service has not been easy – and there are still obstacles in our path as we strive for further improvements. However, through perseverance, leadership and a fundamental belief that technology can make a major contribution to patient-centred care, we're redesigning our services in line with modern needs and modern communications – and using digital tools to help drive better patient outcomes.

Paediatric diabetes: context
Paediatric diabetes remains a major challenge in the UK. It has the fourth highest number of children and young people (CYP) with diabetes in Europe, and though the most recent National Paediatric Diabetes Audit (NPDA) shows steady improvement in the number of CYP achieving excellent diabetes control, it's still one of Europe's worst-performing countries in terms of blood glucose control. Nationally in 2014/15, less than a third of CYP with type 1 diabetes achieved the old HbA1c target of 7.5%. During 2015/16, Southport and Ormskirk NHS Trust improved its HbA1c outcome to 7.8% median and 34.2% of its patients had HbA1c of less than 7.5%.

Glucose control is just one of many NICE metrics to benchmark performance in paediatric diabetes. Paediatric Day Units (PDUs) are required to record and report patient progress against seven health checks; HbA1c BMI, blood pressure, urinary albumin, cholesterol, eye screening and foot examination. The theory is that if we can identify problems at an early stage, we're better-placed to prompt immediate action and improve patient management. In practice, the realities of clinical practice, and the complexities of managing paediatric patients, make completing all seven health checks difficult. Non-attendance rates are particularly high in young adult clinics, whilst ensuring patients maintain accurate diaries for clinical review is a perennial challenge. These complexities naturally impede the optimal completion of care processes. The latest audit figures for Southport & Ormskirk reveal that from April 2015 – March 2016, the number of young people aged 12 years and older shown to have undergone all seven health checks has increased to 45.6% compared to 35.5% across England and Wales.

However, completing the care processes is just one part of the problem. For many trusts, recording and accessing the data to enable optimal patient care is an additional challenge. A high number of PDUs still use paper-based systems to manage patient information. With much diabetes care carried out in community settings, this not only impacts the speed, continuity and quality of care, it makes mandatory audit processes expensive and inefficient. It's one area where technology can make a significant difference.

Technology in action
The holistic challenges of paediatric diabetes care are familiar to Southport and Ormskirk. In 2011, the trust was audited by the CCG and found to be an outlier in terms of overall HbA1c outcomes. Furthermore, it had the highest DKA admission rates and hospital admissions due to diabetes. To compound it, with NPDA data submissions dependent on manual data entry, our 2011/12 submission had excluded 49 out of 117 patients because of incomplete data, while the MDT noted 43% incomplete record of care processes due to manual data entry procedures. We knew that if we were to meet national standards and maintain the ICO's reputation for high-quality children's services, we needed to improve communications by harnessing technology.

In 2012, to coincide with the introduction of a mandatory NPDA and the Best Practice Tariff (BPT), we deployed Twinkle, a specialist electronic health record system for paediatric diabetes patients. The web-based system, which is provided on a software-as-a-service basis and requires no on-site installation, gives our diabetes teams – whether they're in the hospital or the community – instant access to patient records. This allows us to undertake monthly audits to identify patients where intervention may be beneficial. Twinkle helps us highlight patients with poor metabolic control, frequent DNAs or those who have been admitted as inpatients. These patients are subsequently targeted for more intensive contact, education, specialist support or, where necessary, increased frequency in outpatient appointments.

Fundamentally, Twinkle has empowered the full composite of the multidisciplinary team – specialists, nurses, dieticians and psychologists – with greater visibility of what's happening with our patients and given us the insight to make proactive and informed responses to their needs. We no longer have to go through clinical records manually to find the patients with poor HbA1c control, who are due for their annual structured education session, or who frequently DNA. It's frightening to think that we ever did. We can now identify them at the click of a button – and accelerate care accordingly. The monthly audit has become a 10-second job. Twinkle is a continuous intervention and a great example of how technology can be used to help provide better patient-centred services. We could never go back to the old way.

What's more, the system provides a real-world health check on our own performance – allowing us to review PDU performance against core care processes. Twinkle has transformed our annual audit procedures, eliminating labour-intensive manual processes, freeing up resources and driving efficiencies. Better still, our ability to demonstrate that we're meeting national standards has helped us unlock funding through the BPT.

The outcomes
It would be misleading to suggest that technology has been the single driver of improvement at Southport and Ormskirk – it's just one piece of a complex jigsaw. But evidence shows that we're heading in the right direction. National audits reveal year-on-year improvements in the core areas. In 2013, HbA1c levels showed marked improvement, whilst hospital admissions and length of stay were significantly reduced. In 2015/16, 33.2% of our CYP with Type 1 diabetes had an HbA1c of less than 58 mmol/mol, compared to the national figure for England and Wales (26.6%). Similarly, the PDU's completion rate of all seven key care processes was 15% higher than the national figure. These results are borne out in patient satisfaction surveys, which consistently highlight that both CYP and parents recognise and value the PDU's use of technology in supporting their needs. The introduction of Diasend, allowing patients to download data from their devices both in outpatient clinics and from home, and our careful use of social media, have played a valuable part.

Footprints for the future
Today's paediatric care means engaging the millennial generation. We cannot afford to run away from it – we must instead learn to communicate in their language using their tools. It will not be easy. When we first introduced it, Southport and Ormskirk was the only paediatric diabetes team with its own Facebook page – and we needed to satisfy a range of Information Governance requirements to get the green light. The response has been overwhelmingly positive. It's been worth the hard yards.

And that's the ultimate message. Digital transformation is not a quick fix for the NHS – and there are many barriers in its way. But it's too easy to fall at the first hurdle. Digital technology, whether that's information management systems, mobile tools or social media, can transform healthcare services in the UK. The most successful organisations will be those that show the clinical leadership and determination to drive change, and develop compelling business cases that prove how digital technology can improve patient care. It's what we strive to do at Southport and Ormskirk. We did it with Twinkle. Now Skype is next.

This case study/article is by Pediatric endocrinologist May Ng, MBBS (Hons), FHEA, FRCPCH, LLM, PhD, of Southport and Ormskirk Hospital National Health Service (NHS) Trust and Hicom. Twinkle is Hicom's paediatric diabetes management solution.

For more information contact Hicom at jon.elburn@hicom.co.uk, +44 (0) 1483 794 945, or *www.hicom.co.uk* ∎

How to Implement A Digital Clinical Pathway Simply And Efficiently

The last few years, Trusts have been under more stress than ever to create cost savings and efficiency through new ways of working. This has created an opportunity for innovative digital health companies to support the NHS. However, in the majority of areas across the UK there continues to be a lack of digital services and clinical pathways. This article sets out to show how simple and effective implementation can be.

Due to local pressures and national objectives, in 2012, County Durham and Darlington Foundation Trust (CDDFT) in partnership with Inhealthcare Ltd. (Health Call) developed and implemented a digital pathway to allow anticoagulation patients to self-monitor. Today, there are over 450 patients enrolled on the service and the benefits to patients, clinicians and the Trust have already been demonstrated. Inhealthcare, the digital health specialist, and Jeannie Hardy, the Project Lead at CDDFT, have collaborated to share the process involved in the implementation, the roll out and the evaluation of a digital clinical pathway.

Four simple steps to implementation:

1. Set your objectives

It is important to have clear objectives set out for the Trust, for the clinician and for the patient. With the limited resources and growing populations, forward planning is key for any Trust and objectives should tie into these overall aims. In CDDFT, one of the Trust's objectives in 2012 was to modernise IT and telehealth was one of the "Top 10 IT projects". CDDFT also considered scalability as a key objective, not only thinking about the number of patients in their area who could benefit from the service, but also whether it could be replicated in other areas around the country. At the time, other Trusts were looking to try telehealth and digital solutions, but CDDFT were ahead of the curve with their ideas around digitising a clinical pathway and the recognised impact self-monitoring can have.

Driven by the emphasis for forward planning at CDDFT, managers were encouraged to review their services and pathways and come up with ideas for what could be done differently to drive efficiency. For Jeannie, looking at telehealth, building a pathway around allowing anti-coagulation patients to self-monitor was the perfect fit. Once Jeannie and the CDDFT team decided it was the digitisation of the anti-coagulation patient pathway they wanted to take forward, they began to develop specific clinical objectives. These included; reducing pressure on warfarin clinics and increasing patient responsibility and ownership, which in turn they hoped would improve patient health.

2. Select your project team

"Issues occur when clinical staff attempt to implement new services without any support. Clinicians often do not have the time or resources to make certain changes so they need a support team to listen, understand and address their concerns." Jeannie Hardy, CDDFT

To implement a digital clinical pathway a cross-organisational and multi-disciplinary team is needed. Communication between the technical and clinical roles is vital. The programme manager from CDDFT, Jeannie, took responsibility for networking between the clinical staff, the technical staff from Inhealthcare, and in the later stages receiving feedback from patients. Jeannie's integral role in the feedback loop continues to this day. The implementation team consisted of:

NHS	Commercial Organisation
Programme Manager: Jeannie Hardy, Telehealth Programme Manager, CDDFT	**Project Lead:** Richard Quine, Product Director
Clinical Lead: Tracy Murphy, Anticoagulation Sister, CDDFT	**Technical Lead:** Richard Ward, Inhealthcare
Clinical Support: Number of Anticoagulation Nurses, CDDFT	
Technology Manager: CDDFT Technology Rep	
Business Manager: Ian Dove, Business Development Team, CDDFT	

3. Implementation

Initial Planning
Once the implementation team was in place, the initial planning involved shaping the ideas for the digital self-monitoring service. It was key for the team that the technology fit into the existing clinical pathway and Inhealthcare were able to develop their platform to the clinician's requirements. The different roles within the Trust and Inhealthcare also used these months to build good working relationships. These relationships are important for clinical buy in, without which the service implementation is likely to suffer. During this first stage there were weekly team meetings to gather ideas, ad-

vice and reflect on progress. It is important to always keep the set objectives in mind.

Pathway Design
Inhealthcare's Digital Pathway Builder allows clinicians to design their own pathway to suit their real, clinical needs. Six months into the implementation, Inhealthcare had been supplied with a clear plan of how their software should look, function and what the outcomes should be. The next two months then consisted of a technical build and 'pre-testing' stage, where the project team gave active feedback throughout. They planned for patients to use an INR self-testing device at home and send their readings securely to the clinic via a pre-arranged phone call. Additional communication methods including a smart phone app and email have since been made available to the Trust. The Inhealthcare technology could then allow this data to be integrated directly into the patient's record. The patient's new warfarin dosage can be relayed back to them, following calculation by a specialist nurse, supported by the anti-coagulation computer support software system which the nurses were already using in clinic.

The governance roles in the project team ensured the platform was complying with information governance standards and patient safety regulations. The platform was also built to be interoperable with the NHS network, so patient data can be submitted securely into their patient records and be available to their authorised care team in real-time. "Inhealthcare were able to make technical changes to the software to meet the feedback they received from the clinicians. They understand how good clinical involvement is vital in making the implementation of a digital pathway a success." Jeannie Hardy, CDDFT

Staff Training
Two weeks before patients were due to be recruited and enrolled, the anticoagulation nursing team at CDDFT were introduced and trained how to use Inhealthcare's web portal. A staff training handsheet was also developed to outline the proposal of the service, the benefits and the training procedure. Inhealthcare leads and Jeannie took the key roles in this training, however Tracy Murphy, Anticoagulation Sister, CDDFT is seen as instrumental in the success of the implementation. Her enthusiasm and dedication meant the nurses quickly became confident with using the digital
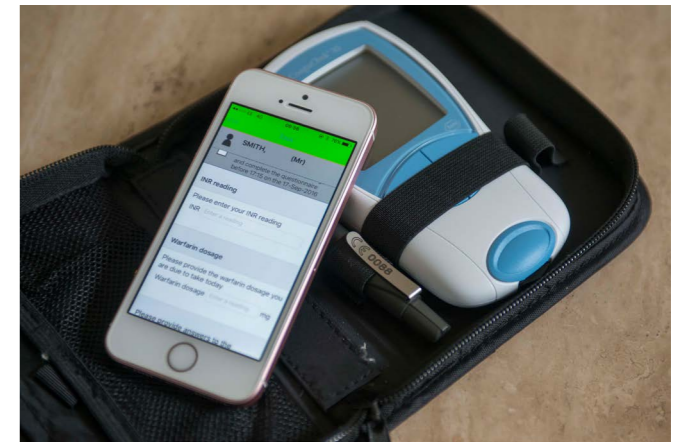
pathway and seeing the benefits for themselves and the patients. Her and her team also used this time to feedback to the technical team who were able to shape the software around their needs and concerns.

As some nurses were apprehensive towards changing the service, including automated phone calls, it was important for the support infrastructure to be clearly communicated at this point. During the first week the service was running, a technical role from Inhealthcare was present in the clinic to support the nurses and instil them with confidence in their role. The technical Inhealthcare trainer and project lead continue to be on the other end of the phone for any concerns coming from the clinic and keep up the momentum for rolling out the service.

Initial Patient Recruitment and Enrolment
A criteria was developed for patient suitability before any patients were enrolled onto the service. Starting with this criteria, the first 100 patients were handpicked by the clinical team for qualities which suited self-management, for example independence, confidence with technology, and importantly a stable condition. Inhealthcare's digital pathway allowed patients to self-monitor and receive automated telephone calls to collect their results and relay dosage instructions back to them. They now plan to use email or a mobile app. This choice was developed in order to engage a wider variety of patients.

Communicating the benefits to patients, ensuring they are fully equipped and feel fully supported are all essential elements to prevent later withdrawal. Jeannie and Tracy now run the training days, but the initial 'Cohort 1' patients were trained by a Roche nurse trainer and Jeannie. These patients were then given a key role in shaping the pathway design. Focus groups were held, for which 50% of enrolled patients commonly participated, to feedback to the clinical and technical team.

Once the first 100 patients were enrolled and fairly comfortable with the service, the nurses and clinicians extended the invite to a second 100 forming 'Cohort 2'. This was made possible by extra funding following the initial success. These patients were selected by their potential gain from not having

to visit clinics, for example if they lived far away, frequently travelled or struggled to get to clinics. The enrolment process was repeated for this group, with flexible training made available to them. They also had the opportunity to feedback to the software developers through the project manager.

Increasing Patient Numbers

Jeannie adds, "With any self-monitoring service, there have got to be benefits to the patients or they won't engage and the implementation won't be successful."

Moving forward from the clinician-selected initial group, patients were able to self-refer themselves onto the digital pathway. The project team invested in many resources to communicate their new service:

» Patient leaflets
» Posters
» Newsletter2
» External PR including a feature on ITV Tyne Tees evening news

The team also understood that the launch of the new service should be communicated to the wider healthcare community, especially GPs, for patients to be informed. CDDFT hosted meetings with GPs from the local area to inform them about the new pathway and to encourage them to think about their patients who may be suitable.

Four years later, patient recruitment, enrolment and subsequent training is still ongoing together with the project team's continuing dedication. Currently, over 400 patients are enrolled on the service.

4. Evaluation and results

Benefits for the patients

Questionnaires were used to gather qualitative and quantitative data around the patients' expectation and satisfaction of the service. The initial group of patients performed a pre- and post-training questionnaire. The focus groups were another method the project team collected feedback. The patient feedback was almost universally positive:

INR Self-Monitoring Patient Questionnaire Data from Inhealthcare
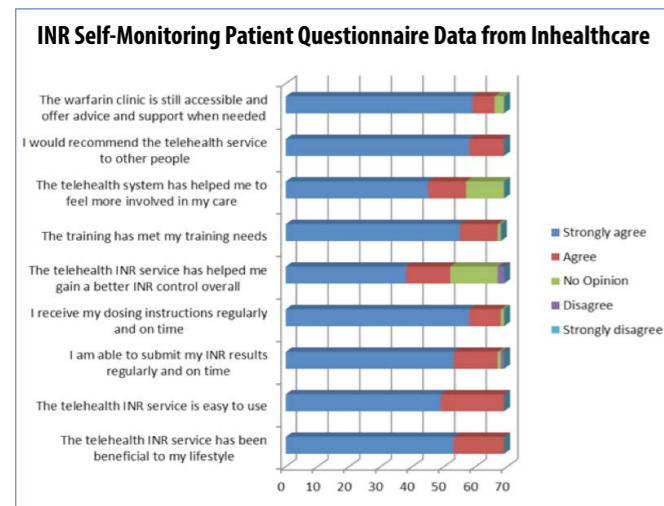
	INR Self-Testing Cohort 1	INR Self-Testing Cohort 2
Number of patients	100	100
Recruitment Selection Criteria	Narrow Most were hand-picked by staff	Broad Most were recruited from additional communication
TTR - 6 months before study	60.4%	59.0%
TTR - 3 months before study	58.9%	59.0%
TTR - 3 months after study	72.8%	71.0%
TTR - 6 months after study	74.4%	75.0%
TTR - 24 months after study	75.6%	76.1%

Patient clinical outcomes are also incredibly important to evaluate. To do so you must first set a baseline. In terms of health outcomes for these patients, their time in therapeutic range (TTR) was assessed. TTR gives an indication of how well their condition is being controlled by the anti-coagulation therapy, the higher the TTR, the lower the risk of adverse thromboembolic events. Two years after starting the service, patients have shown a significant improvement in TTR by 15% compared with pre-study TTR. The results from Cohort 1, the initial 100 patients hand-picked by the staff, were also consistent with Cohort 2 who had a wider range of condition stability. This is a clear demonstration of reliability.

Importantly, patients still feel fully supported as clinicians are available on a supplied helpline, and are notified to make contact if a patient is unresponsive to test requests. Additionally, as their patient data is safely and securely integrated with their record, any clinician-patient interactions are at a higher quality due to the wealth of information and condition history stored in the patient's record. This is an example of where interoperability from patient to their NHS care team is safe, efficient and proactive.

Derek Jones, CDDFT patient reports "If there's a reason you can't commit to the clinic or you're working, this service will really help you out. I would never go back to relying on the clinic staff; I'd like to keep up this method of monitoring for as long as I can, because it's better for everyone involved." Due to more people using the service and being able to self-test at home, the clinics (and therefore hospital car parks) aren't as busy so more of the clinician's time can be spent with those complex patients who need it. "I can't fault the service; measuring my INR isn't even an inconvenience anymore" Derek adds.

Benefits for the clinicians and Trust

To gain data from the staff opinion of the service, the an-

Jeannie's 5 Top Tips for Implementing a Digital Clinical Pathway

1 Highlight the benefits for the patients, clinical team and the Trust – it is important to show key stakeholders how your new digital service will meet and hopefully exceed their needs.

2 Build your dream team – a multi-disciplinary team is essential to consider all perspectives. We had representatives from the anticoagulation clinical team, IT, our business manager, clinical governance and a programme lead. We were lucky, because Inhealthcare (our service provider) wanted to be included in our weekly meeting too - this really helped us build a bespoke service, right for our Trust.

3 Training, Training, Training – implementing a new clinical digital service requires building confidence amongst patients and clinicians. Inhealthcare provided us with regular access to their expert trainer, to allow our clinical staff to feel knowledgeable and comfortable with the new software. We hold training for new, and continue to provide training for existing patients, as we learn a lot from these sessions.

4 Listen to feedback – encourage regular feedback from patients, clinicians and other users to continually improve the service, patients' health and engagement. We hold regular patient and clinician focus groups and carry out patient questionnaires to understand their concerns and benefits. Inhealthcare encourage us to feedback our findings so they can continue to improve their service.

5 Keep everything simple – digital health does not have to be complicated, but should follow existing clinical pathways. Keep communication and training simple, and devices easy to follow, so all new digital clinical services can be understood and embraced.

ti-coagulation nurses were given a questionnaire to feedback their views on the service, giving positive feedback throughout:

» 75% of respondent clinic staff strongly agreed that the INR self-monitoring service has helped improve the anti-coagulation service
» 75% also strongly agreed that the Inhealthcare web portal is easy to use.
» When asked if training around the web portal met their needs, 100% either strongly agreed or agreed[1].

It is important to build a business case around any new service to feedback to the Trust, CCG or commissioner. As forward thinking was a key focus for CDDFT, demonstrating the efficiency and cost savings around the new clinical pathway was vital. The business evaluation found, since March 2013 the service had delivered significant efficiency improvements including a saving of 21,000 clinic appointments1. This is equivalent to a £125,000 saving in staff time and consumables1. The digital service is now integrated with 4S DAWN's anticoagulation software. This enables results, from self-monitoring warfarin patients at home, to be made immediately available to the warfarin clinic team. The integration removes the need for a nurse to manually enter the patient's test results into the DAWN AC software, makes calculating the dose even quicker, reduces the admin for the NHS anti-coagulation team, and allows nurses more time for clinical care. The business case from the implementation of this service is being considered as a case study for how to improve other clinical pathways with digital health.

Ian Dove, CDDFT's Business Development Manager comments, "The efficiency improvements that the trust has made through saving clinic appointments are excellent. This service allows clinicians to work more efficiently and has reduced the risk that clerical errors can impact upon clinical care. At CDDFT we are determined to assist in the development of a fully digital NHS by 2020, and the world's most efficient healthcare system."

Jeannie concludes, "Outcomes were achieved which we never expected, such as the improvement in TTR and therefore the longer term health benefits, which feeds back into relieving pressures on the whole health community. What's also been a great indirect benefit is the direct link to patient records because if and when the patient ends up going to see their GP, they can see a fuller picture of the patient's health and can make a fast, well-informed decision. It goes to show how successful the service has been."

Looking forward, using this model as a case study, it is clear that Inhealthcare's digital platform is scalable. Together with another clinical team, the initial planning and pathway design could be repeated to shape the digital platform to their clinical pathway, whether this be anticoagulation, diabetes or mental health. This could be repeated again for CDDFT or any care environment across the UK. With these simple steps to implementation, digital transformation of existing pathways should be easily become common.

References
1. Data available from Inhealthcare. ∎

Cutting Edge ED Technology at St Vincent's University Hospital Improves Patient Pathways throughout the Department

INTRODUCTION

St Vincent's University Hospital wanted to create a more modern and efficient way of running its emergency department (ED), to support clinicians in safely and effectively managing patient pathways throughout the department. The hospital, which has a mission to continue to achieve excellence and relevance in healthcare delivery, partnered with IMS MAXIMS to implement a functionally rich, easy-to-use ED system that fully integrates with other hospital systems and provides a comprehensive suite of reporting analytical tools. The new software, live since November 2015, allows real-time tracking of a patient journey through the department and provides an instant overview of a patient's status, while improved reporting now measures key performance targets set by the Health Service Executive (HSE).

THE CHALLENGE

The rise in demand of healthcare services in Ireland has heightened the immediate requirement to coordinate care as effectively and efficiently as possible. As one of the country's busiest EDs, St Vincent's identified technology as a key enabler for transforming the care delivery and looked to upgrade its existing IMS MAXIMS ED system, which had been in place for 14 years. The software had served the department well, but the hospital had since outgrown its functionality and needed something that would give consultants and their teams the capability to maximise the operation of the ED.

Becoming more efficient would allow clinicians to reduce the time spent on unnecessary administrative tasks and increase contact time with patients. It would also help to facilitate communication between departments and with patients and other healthcare providers, such as GPs, plus reduce bottlenecks while further saving staff time.

At the time, the ED was planning to become a much larger department, having experienced significant rises in emergency admissions. It had grown from just over 33,500 attendances back in 2002, when the original IMS MAXIMS system was installed, to around 50,000 for the last two years. This move to a larger location presented an ideal opportunity to change to a more powerful, modern and flexible ED system that could share information across departments and would

underpin the department for many years to come.

THE SOLUTION

St Vincent's worked closely with IMS MAXIMS to install and test new functionality of the ED system which would go on to transform the way the department operated. The new system provides:

» Real-time, configurable patient tracking, including display of breach time indicators, KPIs, alerts, re-attendance, prioritisation of patients

» Notification of new results and clinical notifications, previous history, incoming arrivals

» Triage work-list and assessment, supporting multiple triage protocols, highlighting urgency levels, allocating nursing staff and providing decision support to define pathways

» Clinician work-list and assessments, support the streamlining of patients for clinician intervention

» Discharge summaries that include future care plans, support network, medication, outpatient booking and clinical outcomes

Improving pathways

A multidisciplinary team involving consultants, senior nursing staff and administrative staff ensured the system would meet the hospital's needs, while dedicated project managers at both St Vincent's and IMS MAXIMS worked alongside each other, to ensure the project met the clinical requirements of users.

Both teams recognised that streamlining and improving pathways could help gain vital seconds and minutes and reduce delays on a patient's progress through the ED, supporting more timely clinical care. Professor John Ryan, consultant in emergency medicine at St Vincent's said: "Access to demographic data on our patients allows us to deliver timely critical care to injured and ill patients that attend our department with emergencies."

Healthcare professionals (HCPs) were fully engaged with the project, providing support and consultation within

their functional area of the ED, so that any potential issues across registration, triage, diagnosis and treatment and discharge could be quickly highlighted and resolved using HCPs experience.

Usability was a major requirement and teams focused on reducing clicks and increasing software integration to lower the number of times staff had to log-in to disparate systems. In addition, hospital reports, training videos and links to third party systems were integrated into the solution to provide all resources in one place.

By enhancing the previous system's reporting facilities, St Vincent's have greater visibility of trends in admissions from ED, which can produce useful insights into improving areas of the patient experience. Professor John Ryan said: "The tracking system is highly valuable for ourselves and visiting physicians in locating patients in an environment where there can at times be in excess of 100 patients being cared for. In a data driven department where we place so much emphasis on audit and research, the search facilities and report generation give us comprehensive access to information on our business, allowing us to plan staffing and resources that matches the demand."

Reporting to local and national requests to provide new patient pathway information is an important function to help measure the ED's performance. The hospital can now run Patient Experience Times reports for the Health Service Executive or reply to ED task force requests quicker and more easily, by linking the reporting functionality directly to the discharge process.

The integration and data migration challenge

The hospital chose to upgrade to IMS MAXIMS' latest ED module and implement, what in practice, was a completely new application. This involved migrating 16.5 million records from the previous system, creating new interfaces and a large amount of data mapping testing.

The project team built a new bi-directional interface for the ED, to ensure clinical and administrative data could move

seamlessly between the hospital's Patient Administration System (PAS) and other hospital systems, and be available for clinical use at the point-of-care. In addition to reducing the amount of manual processes performed by administration staff, the interface updates Patient Master Index and Admission Discharge and Transfer activity in real-time, to help coordinate care more efficiently, and reduce the risk of any unnecessary delays in transfer or medical errors.

"Without this system it would be impossible to treat and care for patients across the different zones of the ED. As an extremely busy department, we required an IT system that was flexible to adapt to the evolving needs of emergency medicine. From the start we had the confidence that IMS MAXIMS could deliver the system," explained Dermot Cullinan, director of ICT at St Vincent's University Hospital.

THE BENEFITS

More efficient care

The new system ensures St Vincent's can manage the demands on the department 24/7; the tool is rapidly becoming the eyes and ears of the department. Senior consultants remain in control wherever they are in the hospital, accessing the system on iPads to gain an overview of staff movements and using it to deliver care to patients within specific timeframes. This real-time view of the department means issues can be identified quickly and steps taken to avoid them or respond.

"The ED team has an integrated system that has facilitated mapping of the patient journey through the department from start to finish, and give a detailed view of what is happening with patients at any given time. The comprehensive tracking capability of the system allows medical staff to have a complete view of patients from anywhere in the department and beyond ending the reliance that would have existed with a paper-based or white board oriented solution," added Dermot Cullinan.

Reporting on department performance has also been significantly improved – St Vincent's no longer has to use third party tools to generate reports and wait weeks for the results. The new system has its own reporting database which means detailed reports are created within hours. This allows staff to conduct a quick and efficient handover during the morning and evening patient assessments while externally, they allow St Vincent's to report to the HSE on patient experience targets including wait time and triage time.

The faster and detailed reporting function means St Vincent's can predict trends and analyse admissions by the hour allowing hospital staff to identify areas of improvement for the patient experience, and implement appropriate and rapid changes in hospital practice.

"The new system is the cornerstone of how the ED operates – it has simplified and sped-up many core activities

and it would be impossible to manage the department without it," concluded Dermot Cullinan. "It's a powerful tool for making sure we keep on top of what's happening within the department. Its advanced reporting capability is helping us to energise our data, allowing us to move from reactive, historical reporting to proactive modelling of the ED, its relationship with the wider hospital and the community."

One example of the streamlined core activity is the generation of discharge notes, as Professor John Ryan explains: "We also welcome the discharge letter facility which pulls together the presenting complaint, investigations, treatment and diagnosis into a functional letter for patients' general practitioners on discharge."

Reducing clinical risk

St Vincent's now has a modern and effective solution that enables nurses and clinicians to better manage patient journeys through the department. The team

Sample: Manchester Triage V3 Same

has designed and built a number of Integrated Care Pathways (ICPs) in the new software including Waterlow, Sepsis,

Falls, MEDEL, MITT. The extensive training St Vincent's received from IMS MAXIMS means the hospital has built an in-house capability to quickly and comprehensively build and maintain existing ICPs, as and when required.

The new software arms clinicians with patient information securely, wherever and whenever it's needed, including the urgency of each case, the length of wait and any risk factors. It provides everything that St Vincent's needs to ensure patients follow the best possible pathway and helps avoid waiting time breaches with on-screen alerts. The information captured is readily available for HCPs should a patient re-attend in the future, reducing the likelihood that a patient will have to re-tell their medical history numerous times to different clinicians.

The move away from paper-based care has helped eliminate issues created by missing patient notes, mislaid orders or results and unreadable handwriting. St Vincent's now have a much more complete patient record, accessible by all appropriate ED staff, supporting the delivery of safer, better care.

FUTURE PLANS

In terms of future plans, the ICT team is already receiving requests and ideas from the ED for what it would like to

see coming next – a positive move which will help the system remain in tune with business needs. Internally, St Vincent's plan is to move the ED to a completely electronic patient record in the next 12-18 months and has already started the process.

This move aims to significantly reduce the current clerical workload shared by the ED multidisciplinary team. Physicians will be able to record their notes electronically with tablet devices at the bedside and from these same notes automatically generate discharge letters and prescriptions – optimising the legibility and quality of medical records in the process.

The fully customisable software will allow the department to extend the functionality to include integrated care pathways, nursing triage and assessment/reassessment documentation, early warning score functionality, patient notes and handovers, with the ultimate aim to become a paperless department in the future.

With a view to integrate care outside the hospital, the new ED module will be extended to St Michael's in Dun Laoghaire later in 2016. Beyond this, St Vincent's plan to generate electronic messaging of discharge summaries and clinical records to allow continuity of care into the primary sector. ■
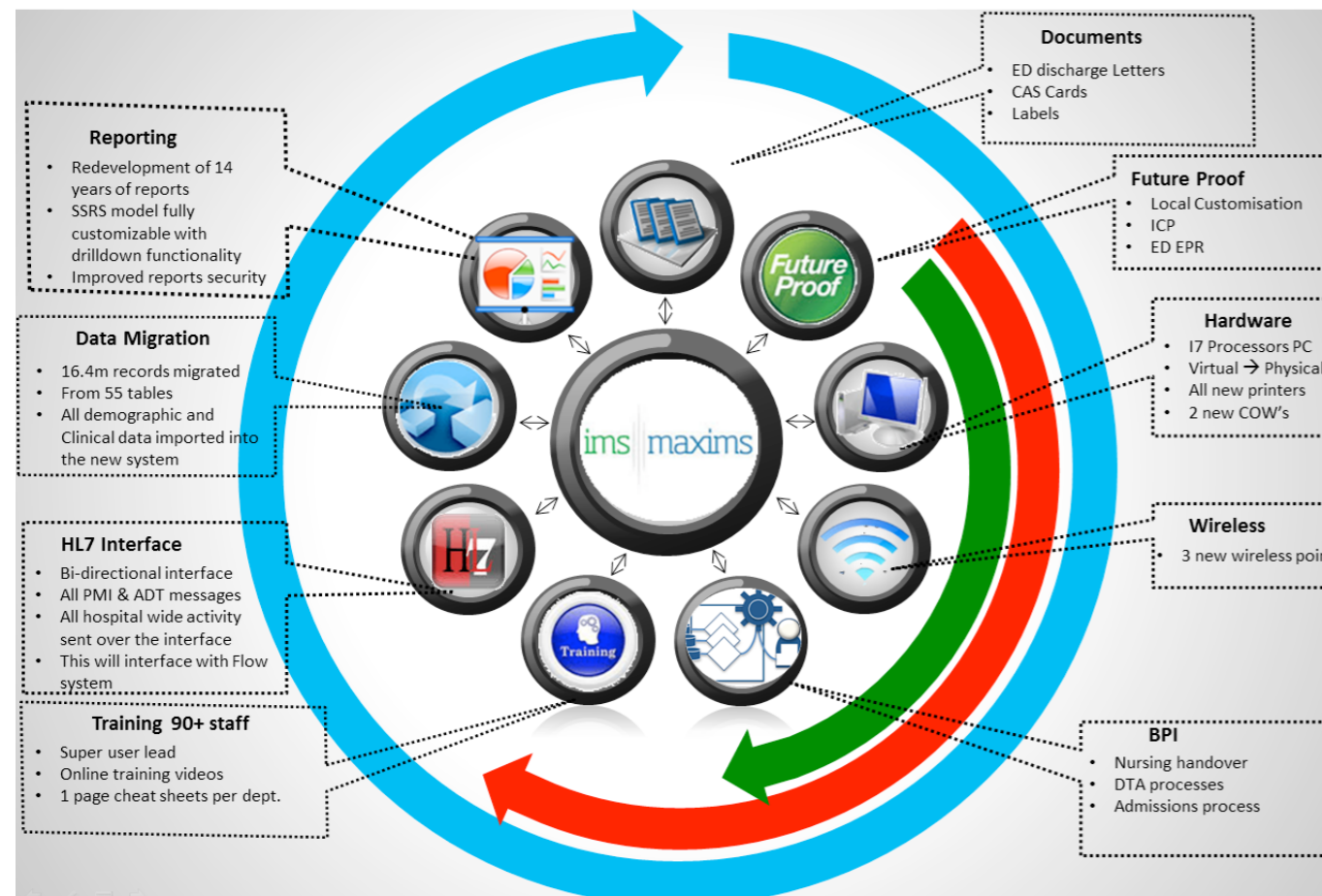
Sample: Clinical Assessment Worklist

Project Components

St Helens Makes Major Patient Safety Advances with Electronic Early Warning System

Care quality and patient safety benefits being realised after introduction of Patientrack e-observation system at St Helens and Knowsley Teaching Hospitals NHS Trust

Patients and staff at a north-west NHS trust are starting to see the high-impact benefits of technology-enabled care after the introduction of early warning and alerting technology Patientrack.

The system is helping healthcare professionals across 55 wards at St Helens and Knowsley Teaching Hospitals NHS Trust quickly identify the sickest patients, and manage them in the most effective way possible, whilst also enabling more efficient care practices and so releasing staff time to care.

Patientrack is being used by a growing number of NHS hospitals in the UK, where nurses use the software to record vital signs observations. The system then automatically calculates a patient's early warning score, and shows clinicians when signs of deterioration are present enabling rapid intervention. Such intervention is crucial to help prevent a patient's condition escalating, and requiring additional care.

Following the introduction of Patientrack, St Helens and Knowsley has recorded a significant drop in the number of patients requiring higher levels of care. 'High risk admissions' to its critical care unit fell from over 10% of inpatients in 2015-16, to under 5% in the first half of 2016-17. It has also seen calls to its medical emergency team, which responds to patients in most need, fall by a fifth.

Hospital teams at the trust, who access the system on iPads, have also saved thousands of hours after seeing a two-thirds reduction in time spent performing observations using Patientrack, which is in use in different hospitals across the UK and has been linked to lower rates of cardiac arrests.

Dr Tushar Mahambrey, consultant in intensive care medicine and anaesthetics and Patientrack clinical lead, said: "Nurses have more time to spend actively caring for patients now that we have introduced Patientrack. They can quickly and accurately capture important patient observations at the bedside which is then shared with clinical colleagues across the hospital instantly."

Patientrack is also helping NHS professionals assess patients to help prevent deadly conditions including sepsis and acute kidney injury, and this flexibility is something that St Helens and Knowsley is also embracing. Financial savings also are ex-

pected through the need for fewer bed days in intensive care.

The trust is further developing its use of Patientrack, and is one of the early adopters for using the technology to support clinical decision making in its fast-paced emergency department. It is also looking to consolidate five assessment forms into one to speed the admissions process, which should see more efficient patient flow.

The system is replacing outdated paper-based observations, meaning details on a patient's status will no longer be confined to individual wards and beds. Instead crucial vital signs information is instantaneously available to healthcare professionals throughout the hospital, regardless of their location, so that they can prioritise patients and act swiftly for those in need. Cost savings through achieving the NHS's paperless vision are an added benefit.

Christine Walters, the trust's director of informatics, said: "We certainly see this as a key clinical system. There are great opportunities to help us further improve patient safety and

deliver better outcomes for patients, at the same time as addressing local and national objectives for the NHS. Clinical staff have embraced Patientrack fully."

Clinical engagement has been critical to the success of the project to ensure the system was tailored to real needs. Debbie Warburton, business change nurse, said: "Clinical involvement in the development of software is essential; not only does it ensure that the software will be based around the needs of patients and clinicians, it also means that staff have confidence that the new system will be fit for purpose. Staff have really embraced Patientrack. People like the system for different reasons, some because it saves them time compared to using paper notes, instead accessing information on their iPads. Knowledge of when observations are due is clearer and challenges with handwriting, completeness of observations and audit have now been overcome."

Donald Kennedy, managing director of Patientrack, said: "This is a compelling example of an NHS trust taking the initiative with innovative technology to make important advances in patient safety. St Helens and Knowsley Teaching Hospitals has chosen to partner with a flexible UK SME to achieve this, where technology is not imposed, but is tailored and adapted to meet local clinical priorities and achieve a rapid impact for the NHS."

Hospitals across England and Scotland have been recognised for their innovative work after working with Patientrack to deliver major impacts on patient safety.

NHS Fife, which significantly cut cardiac arrests and dramatically transformed clinical practice within just six months of using Patientrack, won the digital health award from Holyrood's 2016 Connect ICT awards in Scotland; and, Central Manchester University Hospitals NHS Foundation Trust (CMFT) received the 2016 North West Informatics Award for the best improvement in patient safety, following their work to transform acute care.

About Patientrack
Patientrack helps hospitals deliver safer cost effective care – by ensuring observation and assessment protocols are carried out correctly and consistently, and by automatically calculating early warning scores and alerting clinicians when interventions are needed. Through early identification of deteriorating patients, and the promoting of necessary assessments, Patientrack helps hospitals meet national and local targets for improvements in patient safety and outcomes whilst supporting frontline staff and reducing the need for paper notes. Patientrack was developed in conjunction with health professionals and its effectiveness in delivering both patient safety and cost improvements has been proven in a peer-reviewed clinical journal. ∎

The
Journal of mHealth
The Global Voice of mHealth

Simedics

Achieving Digital Excellence in the NHS