A SUPPLIER RESPONSE
TO THE NHS INFORMATION STRATEGY
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Who are TPP?

TPP are a Leeds–based SME who have been delivering clinical systems to the NHS for 15 years. In 1998, we developed a clinical IT system to share data between a group of GP practices, a GP out of hours service and a hospital diabetes service. That solution, SystmOne, is now used by 150,000 NHS staff across England and hosts electronic records for more than 30 million NHS patients.

From the outset, SystmOne was created to deliver a ‘one patient, one record’ model, aiming to integrate primary, secondary and social care.
Document summary

This document aims to demonstrate:

- **Our understanding of the NHS Information Strategy and the problems it will try to resolve.**
- **Our understanding of the impact the strategy may have on systems suppliers.**
- **How we, as a supplier, believe we can engage with the NHS to achieve the Information Strategy on a national and long-term scale.**

As part of the NHS technology market for over 15 years, we’ve been present through several major changes. The Power of Information strategy brings a new era, where information is key and the patient is placed back at the heart of the NHS.

The challenges the NHS faces now (from fragmented IT landscapes to a growing population of patients with long-term conditions) need timely solutions. The way we traditionally use the NHS is changing; an age of preventing unplanned care and minimising risk is upon us – coupling improved patient care with a need to save money and increase efficiency. We recognise the importance of information and the role that suppliers can play, but also appreciate that the strategy will need cultural change and continuous engagement between all parties.

We outline the challenges in dealing with information for the NHS – from an IT supplier perspective – and highlight the three ways that information can be connected to encourage joined up care. Each of these three will play a role in local strategies attempting to realise the Power of Information.

1. **Join systems together (point to point integration)**
2. **Create a central infrastructure**
3. **Create single system communities**

The benefits and challenges of these three approaches are summarised – backed up with case studies held in the appendices of this document. Regardless of which approach local health economies choose, TPP is committed to helping them achieve their technology goals.

In the final section of this document we aim to communicate the ways in which we are developing our existing technology to achieve the initiatives outlined in the strategy. From developing patient apps, linking with other suppliers and extracting data for business intelligence, the list is extensive. This outlines our commitment to the changing NHS, including our continued desire to engage with NHS England at the highest level and communicate extensively with service users working across the NHS.
Introduction

The NHS strategy, *The Power of Information*, identifies a requirement to utilise technological innovations in healthcare, and outlines the benefits that can be achieved by transforming processes across the NHS, public health and social care. The catalyst in this strategy is information; who can use it, how is it communicated, and what it can be used to achieve.

The strategy considers the benefits of information sharing across multiple healthcare settings. This will ensure everyone involved in a patient’s care has access to quality information when and where they need it. Integration between different systems and services puts the patient’s record at the heart of care and provides an infrastructure for communication, so that multiple services can utilise shared data and contribute to a comprehensive patient record. Such an approach will create transparency in patient care, empowering the patient and encouraging more active involvement in their own care. This open approach will facilitate improvements, drive best practice and rekindle public trust in the services the NHS provides. An approach of transparency will also ensure information can become more useful to the NHS – not just for patient care but also for business intelligence and analysis.

Technology will be at the core of the way we are able to share and use information. However, *The Power of Information* does not simply present ways that technology can offer solutions, more than that, it demands a change in culture and a revised attitude towards the way information is viewed. Whilst respecting confidentiality, data should be a driving force that can be used to improve patient care on a national scale, as well as allowing the highest level of patient care for every individual.

In many cases, the technology required to make *The Power of Information* strategy a reality is already available. System suppliers and users of their systems all have a responsibility to use this technology and their expertise to drive new innovation and improve processes even further. As the healthcare landscape changes, so must the systems used to interact with it. Advances in research require larger and more customisable data extracts; long term condition management requires a more collaborative approach across healthcare settings; and patients can take a more proactive role in their care through the use of online services and apps. Suppliers will work with the NHS to identify the needs of patients, clinicians and commissioners to offer solutions that will improve communication, efficiency and productivity at all levels.
Facing Challenges

Where we are now

Change in the health economy is forcing the NHS to manage risks pre-emptively and pro-actively, to keep costs down and prevent patients from becoming ill. This is a major challenge, but not the only one. The information strategy summarises the current NHS pressures as:

1. **Improving Efficiency And Reducing Waste**
2. **Creating The Best Possible Outcomes (And Having The Facility To Measure Them)**
3. **Increasing Safety And Reducing Risk**
4. **Ensuring Patient Satisfaction**
5. **Promoting Health**
6. **Supporting Long Term Conditions**

To cope with the challenge of both improving and promoting health, whilst actively increasing efficiency right across the NHS, health professionals need to find new and innovative ways of working. The use of technology can facilitate this.

More than 30% of the population are now now living with one or more long term condition. Historically, health organisations have operated independently from one another, with the majority of health problems being solved by a visit to one or two services. Now, many people need support from several services, over months and years. This means there is an even greater need to support service users holistically, blurring the traditional organisational boundaries and taking control of care pathways.

Justin Keen’s paper ‘What is a care pathway?’\(^1\) suggests that as care becomes more complex we require better ways to manage that care in a more proactive manner:

- **Where there are uncertain diagnoses** – full information about the patient ensures a holistic approach and effective decision support.

- **Where the diagnosis is certain** – systems are required to reduce variation, permit real time resource planning and promote efficiency.

- **Where the patient’s environment is uncertain (for example poor social housing)** – joint working with health and social care is required to match capacity with need and ensure communication.

- **With a certain environment** – good communication should be standard.

- **Patient safety needs to be improved** – providing better handover, improved medicines safety and a reduced length of stay.

Where do suppliers and clinicians fit in?

The expertise and enthusiasm of system suppliers in the UK is equally matched by the individuals and teams providing care in the health and social care arena. The challenge is to create environments that allow health and social care professionals, and patients, to maximise the use of available systems. Together we need to create improved solutions and deliver methods to pro-actively manage care, through the sharing of information and knowledge. To be able to make decisions about care pathways there needs to be visibility of what is happening right the way through the pathway, whilst incorporating present and future risks. By changing our perspective from being organisational to patient focussed, we can stop seeing care pathways as individual actions and start seeing them as longitudinal journeys.

The current system landscape

The current clinical system landscape throughout much of the UK is made up of fragmented systems across different care settings. Although competition between suppliers has helped to create the world class software used within specialist areas of the NHS, lack of interoperability and transparency is now a major issue.

Despite this, there are areas of the country that have used the technology currently available to create fantastic examples of connected care. (Some of which have been submitted as examplar case studies to NHS England.) In most areas health and social care professionals, and their patients, are not benefitting from the information that could improve the quality of care, help organisations to drive innovation and increase productivity. In short, the NHS cannot fully achieve the Quality, Innovation, Prevention and Productivity (QIPP) agenda without change. This will require a revolution in the way clinicians work, a cultural shift that will mean health professionals need to look at processes and systems differently.

If technology suppliers and health and social care workers are incentivised to work together to choose processes and systems that work best for their patients, the current situation will be improved. Patient care could (and should) be improved through implementation of an appropriate infrastructure that creates a shared electronic record across all services and all systems suppliers. This allows care pathways to be properly managed.
What’s the future of care in the NHS?

In the future, all aspects of a patient’s record will be electronic, creating a fully digital NHS. Every contact they have with the NHS will be digitalised, providing a longitudinal account of a patient’s health journey across their lifetime. External communication and available resources will also be electronic, forming part of the holistic view of the patient’s record. Patients will also be encouraged to actively take part in the management of their care.

The following two scenarios outline the journey of George, a typical patient, through planned and unplanned care. The two scenarios detail how George is cared for now and how this could change in the future. The vision of how patients are cared for in the future should serve as a target to strive towards. Through the sharing of information, planned care can be managed more effectively, ensuring better patient satisfaction and improved communication between all parties. Additionally, unplanned care can be monitored to actively reduce unnecessary stays in hospital and push the patient back to being managed in primary care.
General practice, A&E and hospital

**OLD**

George registers at a new GP practice

George is admitted to A&E

Fax/Post

Electronic messaging

George is discharged with a care plan and medication.

Verbal/Paper

Online

George’s GP is notified of the admission

Verbal/Paper

Online

George is admitted to hospital.

Phone/Fax

Electronic messaging

They contact George’s GP.

Electronic messaging

Online

Patient experience

Verbal

Online

Discharge notification.

Post

Electronic messaging

Home care planning is coordinated with community care teams.

Verbal/Phone/Post/Fax/

Electronic messaging/Online/Telehealth/Apps

George’s record is kept at the GP practice. Community care also have their own record.

Paper/Electronic system

Electronic messaging/Online/Extracts

**NEW**

George is admitted to A&E – a notification is sent to his GP.

The A&E can see George’s full care history including allergies and medication.

George can see the details of his A&E admission online.

George’s full care history is available.

Electronic medicines reconciliation and multi-disciplinary team discharge planning.

Patient forum to discuss experiences.

George can also leave feedback on his patient experience.


Discharge notification.

Home care planning is coordinated with community care teams.

George can access the care plans online and submit clinical readings using apps.

Data from patient records can be used for risk stratification and independent research.

George’s full patient record is shared between the GP and community care.

George’s record is kept at the GP practice. Community care also have their own record.
Finding Solutions

The role of the supplier

There now exists the “perfect storm” out of which must come radical change. But, even with the best will in the world – and an infinite number of drivers for interoperability – we must recognise that the supplier market is, and will remain, a competitive arena.

“waiting for stability & certainty to design and deliver ‘perfect’ solutions is waiting forever.”

The system suppliers undoubtedly have a duty to innovate with the NHS, but the onus must also be on clinicians and commissioners to choose, procure and use the best technology for their patients.

As the ‘Intellect Response’ paper from 2013\(^2\) states “waiting for stability & certainty to design & deliver ‘perfect’ solutions is waiting forever.” The technology needed to realise the information strategy is largely available now – what the NHS needs is to instigate cultural change, and introduce appropriate incentives for this to happen.

We believe existing and new suppliers to the NHS should provide the means of making useful information accessible to all of the NHS, without unnecessary expense. Ultimately, the NHS have already paid for the storage of patient data through the procurement of electronic patient record systems. TPP want to work with other suppliers, and NHS England, to ensure standards and incentives are in place to allow links between systems to be established.

Essential points

• **IT IS SAFER FOR THE PATIENT** – if the treating health and social care personnel have access to the whole health and social care record.

• **SERVICES SHOULD BE ABLE TO CHOOSE** – the best technologies (or combination of technologies) to meet their needs.

• **SHARING INFORMATION – AND SETTING STANDARDS** – improves data quality consistently across all services, benefitting the patient, the clinician and the commissioner.

• **DATA HELD IN CLINICAL SYSTEMS** – should be securely and easily accessible irrespective of the system in use, according to the patient’s wishes.

• **DATA TRANSPARENCY** – will improve services and make the NHS a more open workplace. It will also allow the NHS to procure and decommission services – improving the choice available to patients.

• **IT’S MORE EFFICIENT FOR SERVICES** – if there’s one single accessible record.

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\(^2\) Digitising the NHS by 2018, Intellect Response, Intellect, March 2013
What options are available?

There are three common approaches to creating a digitalised and connected NHS

1. Point to point interoperability
2. Central infrastructure
3. Single system
Point to point interoperability

In some areas of the country the technology landscape is divided between only a handful of suppliers (often rival companies competing for the same market). This has resulted in silos of data which are held in each system and means that the flow of information is extremely limited.

A clear solution would be to create individual direct interfaces between systems, facilitating the flow of information for the benefit of clinicians, commissioners and patients.

How could this approach be improved?

Some indirect interfaces have already been put in place to ensure data can flow between systems. However, the requirement to have a standardised direct integration between all suppliers would be a further step in providing an improved flow of information. This would require suppliers to work together to achieve a set of standards (and technical requirements) for direct integration. These standards could be facilitated through existing initiatives such as the NHS Interoperability Toolkit (ITK).

An example of this approach can be found in the exemplar case study from North East Ambulance Service (NEAS) submitted to NHS England in April 2013 – found in appendix 1 of this document.

**BENEFITS**

- Uses existing systems – eliminating the need to buy new technology.
- Retains competition in the market.
- Provides opportunities for multiple system patient referrals.

**CHALLENGES**

- Requires all competing suppliers to commit to working together.
- Needs a set of data standards that all suppliers would have to adhere to.
- Inefficient – this connectivity would create multiple interfaces, resulting in an environment that is slow to implement and difficult to manage.
- Creates only information sharing between systems – not a truly connected record.
- There may be a disparity between the type of output from each system – which may not be compatible.
Central infrastructure

In an environment of multiple or disparate systems on a local (or national) level, a central infrastructure approach may be taken.

Some NHS communities have already attempted to create central repositories or data storage solutions. Although some have shown success this route does not necessarily enable the NHS to deliver on all of the Information Strategy.

Development of a core centralised infrastructure (to sit between the many systems) will facilitate sharing of information across all services. This model could make use of existing NHS infrastructure and improve linkages. To do this a standard messaging solution to an accepted central point will need to be developed in association with the NHS.

This will allow all clinical systems to share patient data horizontally and vertically through the healthcare economy. This solution would create links between all services caring for the patient and allow data to be accessed and distributed as it is requested. This means that patient data is available in real time from multiple sources and at the point of care.

**How could this approach be improved?**

Taking and enhancing existing infrastructure to make information from all suppliers available to the user of any system, in real time and at the point of care, would be a huge step forwards. To do this, all system suppliers would have to link into a centralised editable data hub and provide data as and when it is requested.

This central system may also serve as a directory that tracks where a patient has been cared for to allow the relevant data to easily be located. This could be achieved by direct messaging or listening to established messaging methods (for example HL7) from each service provider.

A front–end to this solution could be provided to give a consistent view of the collected data, providing an easy chronological view of the patient record across the different services.

Message handling systems to date are often limited in their scope and may offer read only access to patient information at a cost to the user. A truncated version of the patient record is also of limited use to a clinician as they have to manually interpret a summary or tabular view of information in association with other data sources. Improvements would see a more comprehensive summary of the record (if not the entire record) included in the central infrastructure. Ideally, this form of integration will seamlessly add data in a chronological format to compile the entire patient journey across all services.

<table>
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<tr>
<th>BENEFITS</th>
<th>CHALLENGES</th>
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<tr>
<td>• The portal or message–handling approach displays a unified view of the record.</td>
<td>• Data analysis and business intelligence becomes difficult with disparate systems.</td>
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<td>• No data is stored locally by the message handler or portal, preventing silos.</td>
<td>• Requires a cultural shift within the NHS to share information.</td>
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<td>• Takes advantage of existing systems.</td>
<td>• All suppliers need to agree to collaborative working.</td>
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<tr>
<td>• The cost for data maintenance and hosting is placed on each supplier.</td>
<td>• There are additional challenges around creating a shared patient consent model and easily accessible audit trail.</td>
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<td>• Provides the opportunity to simply “plug and play” new software.</td>
<td>• Finding a cost effective solution.</td>
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Single system

Previous attempts to create a national single system landscape have not been realised, prompting a move to more localised healthcare. In some of these local communities, a single system approach to connected health and social care has worked – from a care, organisational and financial perspective. Particularly on a primary care level, organisations have now increasingly begun to make decisions that will see all of their services moving to the same system. For both Clinical Commissioning Groups (CCGs) and entire health economies, the benefits of a single system are highlighted again and again. Not only can the record be shared securely without the concern of data linkage (allowing patients to visit multiple services across a geographical area) resources can also be shared – creating efficiencies right across communities.

How could this approach be improved?

The system supplier chosen needs to ensure that they have a product that works across the health and social care economy, offering a ‘best of breed’ solution to all users in order to allow existing systems to be replaced. This can only be achieved by suppliers and users engaging to determine the most appropriate roadmap for deployment, ensuring the system is tailored to each individual service.

This model could be further improved through the development of local incentives to encourage individual areas to deploy a working single system approach.

An example of this approach can be found in the examplar case study from Bradford and Airedale, submitted to NHS England in April 2013 – found in appendix 2 of this document.

<table>
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<th>BENEFITS</th>
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<tr>
<td>• A vertical and horizontal integration between primary and secondary care resulting in a chronological care record.</td>
<td>• Initial number of system migrations may be high.</td>
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<td>• One central database used for business intelligence and data analysis.</td>
<td>• Some cost associated with replacing existing systems.</td>
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<td>• Standardised data entry for better quality of information.</td>
<td>• Cultural changes around ensuring clinicians are prepared to share a single record.</td>
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<tr>
<td>• Easier for patients to access their data in a logical way from one source.</td>
<td>• Ensuring continuous development, based on local engagement to maintain an effective solution.</td>
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<td>• Less need for integration standards and message types.</td>
<td>• Reliance on just one supplier to remain committed to the project.</td>
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<tr>
<td>• Resources for training and system administration can be shared across a health community.</td>
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What can TPP offer?

Healthcare economies within the UK have the ability to freely choose how they create joined up care records for their patients. TPP are committed (and have the ability) to help them achieve this goal, irrespective of the model they choose to adopt.

In this section, TPP will outline some of the major features that are currently available (or upcoming) to the NHS through the use of SystmOne.
“I look forward to being able to book appointments and order repeat prescriptions online, communicate electronically with my health and care professionals and use IT and online services to improve my health and better care for myself, where appropriate. I look forward to being able, by 2015, to access my general practice record.”


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**SystmOnline**

TPP’s online patient facing solution, allowing patients to book appointments, order repeat medication, communicate electronically, complete questionnaires and view their electronic patient record.

**Patient choice**

SystmOne solutions are fully integrated with the Spine and Choose and Book. Services can send or receive referrals electronically and the patient has the freedom to choose where they are referred to.

**Apps**

TPP are developing and interfacing with best of breed app solutions for use on mobile and tablet devices, including providing data for the ‘blue button’ patient app³.

**Condition specific patient information**

Clinicians can provide links within the patient record to information sources relevant to the patient care. In the future TPP would like to extend this service to automatically link recorded diagnoses to appropriate information resources. We could also extend the functionality to include links to NHS websites such as NHS choices.

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**Enhanced Data Sharing Model**

Roll out of this functionality to all SystmOne users will be complete by summer 2013. The ability to record consent to share data in and consent to share data out at each service will give the patient full control over who can view every element of their record.

**Empowering Patients**

TPP are currently working to integrate with patient facing condition management tools, for example VitruCare⁴. This will give patients the ability to become more actively involved in, and responsible for, their own care.

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³ [http://www.ehi.co.uk/news/ehi/8444/cerner-and--tpp--show--nhs--blue--button](http://www.ehi.co.uk/news/ehi/8444/cerner-and--tpp--show--nhs--blue--button)

⁴ [http://www.dynarshealthsystems.co.uk/Pages/AboutVitruCare.aspx](http://www.dynarshealthsystems.co.uk/Pages/AboutVitruCare.aspx)
“Many benefits and efficiencies can flow from information being recorded once, at first contact with health and care services, and shared securely between those providing our care.”


**EPR Core**
TPP’s licence free solution to a central infrastructure (discussed on page 14). This module facilitates the creation of an electronic patient record for all patients in this care setting. EPR Core can be integrated with a trust’s Patient Administration System to allow users to easily view and add to the patient record. The module also allows for the export of data to other care providers including electronic discharge letters and e-consultations.

**Shared record**
SystmOne has provided data sharing between organisations for 15 years. As long as the patient gives their consent, the record can be made available across the entire health and social care economy.

**Medical Interoperability Gateway (MIG)**
TPP are developing SystmOne to integrate with the MIG. This will mean that any patient record held on SystmOne, EMIS or INPS will be accessible to users of other systems that can access MIG data.

**Direct integration**
EMIS and TPP are currently working together to develop a direct link between the two systems which currently hold around 95% of GP records in England.6

**Summary Care Record**
SystmOne is fully compliant with SCR functionality. The addition of consent to view an SCR means that it can be made available to any healthcare provider.

**Social Care**
Our social care module seamlessly integrates to provide a fully inclusive health and social care record, including data from the integrated partner financial system.

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Better access to better information

“Access to good quality information, and being supported to use it effectively, is an important health and care service in its own right. Useful, accurate information that is based on evidence is essential for us to make choices about our care and hold services to account.”

NHS POWER OF INFORMATION STRATEGY, 2012

Child Protection Database

TPP are working with the Department of Health to explore the potential for creating a national Child Protection Database. TPP would like to extend this work to alert clinicians in real time as a suspected case arises.

e–consultations

SystmOne allows clinicians to send and receive e–consultations. This process has already been proven to improve efficiency and reduce costs (in a journal article published in the BMJ3).

Standardise data capture

Services can standardise their data capture and output by sharing data entry templates and other tools across healthcare communities.

ResearchOne

A not for profit organisation setup between TPP and the University of Leeds to analyse anonymised data extracted from SystmOne, with the potential to form the largest dynamic research database in the world. The development of tools from this database allows innovation to be fed back into clinical systems, driving evidence-based research into routine practice.

Decision Support

SystmOne provides links to decision support tools and TPP are looking to expand this further. TPP are working with First Databank and the British Medical Journal to implement both medicines optimisation and best practice services.

A ResearchOne examplar case study was submitted to NHS England by the University of Leeds in April 2013 – found in appendix 3 of this document.

3 http://qualitysafety.bmj.com/content/19/5/1.53.abstract
A quality driven information system

“Information must be seen as being core to the business of health and care. Sustained investment in information systems is a core part of delivering high quality, cost-effective health and care services. The Government will not expect every organisation to use the same system, but it will expect different systems to connect.”


Data extracts

TPP currently provide a range of data extracts (from monthly to daily) in line with NHS initiatives and depending on individual service requirements. TPP were the first supplier to complete development and testing of GPES. This makes SystmOne data available for audit and analysis purposes.

Friends and Family

TPP are committed to developing SystmOnline to allow patients to feedback on their experiences. This information could feed into a centralised service that collates this information and makes it available for patients to view.

Working with partners

TPP currently work with over 60 partners and provide a free client-side API to all integration partners. TPP want to continue to work with partner organisations to ensure that all of the aforementioned initiatives are developed to their full potential and SystmOne continues to be interoperable. Utilising the wealth of experience that exists within the field of healthcare software will ensure that system suppliers will meet the needs of the NHS moving forwards. The UK has always been at the forefront of innovation in healthcare and as an SME, we are keen to ensure growth in this market continues, helping to further strengthen the UK economy.
Next steps

In summary, this document outlines how existing technology can be utilised to transform patient care throughout the NHS. We have presented a detailed response to outline solutions that can be implemented across the NHS through collaboration with suppliers, patients and NHS professionals.

TPP are excited by the changes that the Power of Information Strategy will deliver to the NHS and believe that patient care will be significantly improved. Engagement between all stakeholders is key to achieving this.

TPP are keen to engage further with NHS England, and clinicians from across the country, to ensure information can continue to be a driving force for improving the NHS.

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INNOVATION AND INTEGRATION IN HEALTHCARE
Providing an excellent ambulance service is a challenging and demanding task. When a matter of minutes can make the difference between life and death, trusts must do everything they can to make their processes as streamlined and efficient as possible. The North East Ambulance Service NHS Trust (NEAS) has been a pioneer in its field, instigating processes that are now being replicated across the whole country. Through the integration of electronic systems, NEAS ensures not only a timely response to every call, but that patients receive the most appropriate care. NEAS’ innovative use of technology to support their service is not only encouraging ambulance service improvements nationwide but helps realise their mission of ‘right care, right place, right time.’

The North East Ambulance Service has 60 stations and covers the counties of County Durham, Northumberland, and Tyne and Wear, along with the boroughs of Darlington, Hartlepool, Middlesbrough, Redcar, Cleveland and Stockton-on-Tees. With a fleet of over 500 vehicles, NEAS serves 2.6 million people and responds to over 360,000 emergency calls and urgent incidents every year. The A&E service and Patient Transport Service are supported by the NEAS contact centres which receive over 450,000 calls annually.
The North East region presents a number of challenges. Many areas of Durham and Northumberland in particular are sparsely populated, rural areas, making it difficult to know how to position ambulances to provide a quick response. In addition to isolated residents, the North East suffers high levels of disease prevalence. It is therefore essential that NEAS can not only provide a quick response, but that they ensure the response is appropriate so valuable resources are not wasted.

Although unable to change the geography or demographics of their region, NEAS’ innovative use of electronic clinical systems has greatly improved the service they are able to deliver in these challenging circumstances. Previously, contact centre staff had to use a large, paper folder to prompt triage questions and then manually determine corresponding disposition codes. This was time consuming and there was the potential for human error. The Criteria Based Dispatch (CBD) triage system they used did not provide a detailed flow, just prompt questions. Call staff had some clinical training but this meant that there was no consistency across the service as call staff could ask any questions they chose and would not always ascertain all the relevant details. For certain calls, like chest problems, the phone operator would immediately send an ambulance and then end the call. This could result in ambulances attending cases that turned out not to be emergencies. An ambulance response would be sent to nearly every call, regardless of severity, placing unnecessary strain on an already stretched service.
Pioneering technology – innovative solutions

In 2006, NEAS became the first ambulance service to pilot NHS Pathways (a system developed by Connecting for Health to identify the best service to treat a patient, and how quickly they need to be seen, based on their responses to set questions.) NHS Pathways integrates with Cleric, the clinical system used at NEAS, so that the information gathered in the triaging process can be forwarded to the relevant care service. Now, contact centre staff are able to perform a detailed, consistent triage using NHS Pathways, and there is an on-site clinician in each centre to provide further support. By asking more questions, in a structured, standardised flow, the appropriate response can be implemented as soon as possible.

Another important development in the system was the ability to easily stand an ambulance down if it was not needed. Previously an ambulance response was sent to almost every emergency call. Now, when a 999 call is received, the ambulance is dispatched after 60 seconds. The contact centre operative keeps the caller on the phone and uses NHS Pathways to perform the triage. They are then able to divert the ambulance if the triage reveals it is not needed, and arrange alternative, appropriate care. This is hugely important as it means more ambulances are available for emergencies, and patients with less severe conditions can be treated effectively without using resources unnecessarily.

NEAS is also the first, and currently the only, trust to offer electronic appointment booking in association with their 111 service. Normally, if the result of a call is that the patient needs to see a doctor, the patient would have to organise this themselves. There is no guaranteed outcome as the contact centre staff have no way of knowing whether the patient will follow their advice. NEAS therefore use an integration between Cleric and SystmOne, a clinical system that aims to join up healthcare through the ‘one patient, one record’ model. At participating SystmOne PCCs (Primary Care Centres), NEAS staff can instantly book an appointment for the patient. They can also electronically send information from the triage call that can be used in the patient’s appointment. Cleric can also integrate with clinical system Adastra to provide the same service for Adastra PCCs. This functionality makes the whole process more efficient, reduces error and duplication of work, saves time, and improves the patient experience. Steven Pratt, IT Systems Manager said “Integration is essential to providing the best customer experience. The more this is accepted by healthcare providers, the closer we can get to the ultimate goal of delivering excellent patient care.”

The integration of multiple systems is key to the streamline flow of information. In a typical patient example seen in figure 1, we can see how various systems work together to deliver the highest level of patient care.

The streamlined flow of information is part of what makes the system so efficient. All the information gained by the contact centre and the ambulance crew can be made electronically available to the relevant care provider, often before the patient even arrives. Units can also update information on the Directory of Services (DOS) to show how busy they are, so patients are not all sent to a unit that has limited availability, even if it is a bit closer. The integration of multiple systems means information is available immediately so staff can make more informed decisions in their delivery of patient care. Steven Pratt said “The integration of systems allows more involvement and more understanding across the board.”
A call is taken by the Cleric 111 or 999 system. Patient demographics are gained through integration with SPINE.

The patient is triaged using NHS Pathways. Some initial questions establish if the call should be handled by 111 or 999 and the patient can be transferred if necessary. 10% of 111 calls turn out to be emergencies, so the ability to immediately pass the call over to 999 is crucial.

For 999 calls, the NEAS ambulance dispatch team allocate a crew and dispatch an ambulance within 60 seconds of taking the call.

Through Cleric, the contact centre staff can update the ambulance crew with the details from the call e.g. location & patient. This information would feed into the onboard ambulance system, Terrafix, along with the information about the ambulance route, such as road diversions.

If the triage phone call reveals the ambulance is not necessary, a message can be sent to Terrafix via Cleric to stand the ambulance down.

The Directory of Services (DoS) can be accessed following triage to find the best unit to send the patient to.

If the patient needs to see an OOH doctor, integration between Cleric and SystmOne/Adastra allows NEAS staff to immediately book an electronic PCC appointment.

The patient’s registered GP is sent a detailed, electronic post–event message so that they will have a record of the patient’s contact.

A&E can access a read only version of Cleric to see who is coming in, their triage and even track the ambulance location. They can also access the EPRF.

The Directoy of Services (DoS) can be accessed following triage to find the best unit to send the patient to.

NEAS have identified some of the main benefits of an integrated IT solution as:

**Increased patient safety**
With the ability to accurately triage patients and to audit every step of process the chance of errors is greatly reduced. Through the instant transfer of information, the clinician treating the patient can immediately have access to a detailed report which helps them provide the appropriate care.

**Appropriate care response**
Making sure patients are getting the correct care not only saves time and resources, but ultimately provides the best patient experience.

**Joined–up approach**
Integration of electronic systems means there is less duplication of work and wasted time, resulting in a more streamlined process and patient experience.

**Cost effective processes**
Using integrated systems means trusts can save a lot of money on individual system licence fees. NEAS recently saved over £76,000 when they stopped using an additional call centre system. Although harder to measure, NEAS have also saved a lot of staff time when taking calls (as patients are not passed back and forth and work is not duplicated.)
Benefits

Stacey Ayre, Contact Centre Section Manager commented “The numerous benefits of this more streamlined system were immediately apparent. Through integrated systems, NEAS can provide a complete ‘end to end’ service from a single point of contact. 111 has allowed a wider variety of care options to be provided for patients, and has received very positive feedback.”

NEAS have maintained an excellent response time for 111 patients, whilst freeing up more ambulances to attend to 999 emergencies. NHS Pathways triaging ensures there are very few incorrect assessments and information is made immediately available to staff who will treat the patient. Further integration with SystmOne and Adastra means GP and OOH appointments can be booked immediately to ensure a guaranteed patient outcome. Steven Pratt said “We see the integrations and work we are doing as setting the standard of what trusts need to be doing, not just what they should think about doing. Sharing patient information is key to providing the best level of care. Now that we have this functionality available, there is no reason it should not be implemented everywhere.”

Looking Forward

NEAS are proud of the work they have achieved so far, but continue to develop their processes in order to provide an even better service. Working with NHS Pathways, they often make suggestions to help improve the triaging prompts, ensuring staff can record all the relevant information. For example, previously a patient experiencing breathing problems had either an 8 min or 24 hour response time, nothing in between, but now NHS Pathways have added more questions to help gauge the severity and consider other possible care responses. NEAS also investigate ‘near misses’ and trace back the cause to determine any ways to improve their service in future.

NEAS are also looking at a development with OOH provider Northern Doctors Urgent Care to assist End of Life Care. Currently, Northern Doctors send over a daily spreadsheet of any patients added to the End of Life Care list. NEAS are now working to find ways this information can automatically populate fields on Cleric so records are kept up to date.

All 111 services have a national obligation that 5% of the calls they take are out of area. To facilitate this, NEAS are working with South Central Ambulance service and Yorkshire Ambulance Service to pilot further integration between 999 and 111 services. NEAS’ 111 contact centre can take an out of area call, such as via a mobile, and realise it is a 999 emergency. They then use the DoS to profile ambulance services near the patient. Once they have found the most appropriate ambulance provider they can instantly send the information over to them as a 999 call which will flash up on their screen and they can then respond to in the usual manner. Once 111 is fully rolled out, NEAS hope this 111 and 999 integration will operate nationwide.

Looking to the future, NEAS have high hopes of how they can continue to use IT to improve healthcare.
NEAS believe there are tremendous benefits to the patient experience through booking appointments electronically and want this functionality to be made available for more services. With participating PCCs using SystmOne or Adastra, it is already possible for NEAS staff to immediately book an OOH appointment for a patient electronically. NEAS are now hoping GP units will also allow NEAS to book appointments directly into their system. There are several practices in Durham keen to explore this development, and it is hoped that NEAS will work with SystmOne provider TPP to develop this further. Steven Pratt, IT Systems Manager said “Both NEAS and TPP immediately recognized the benefits of electronic bookings and have been working together to make this a reality. Electronic bookings save time and ensure patients in need of care are booked into appointments straight away. Overall, this makes a huge difference in the patient experience, knowing they won’t be put on hold and passed around between different units, but that someone has given their call serious consideration and provided the most appropriate resolution. Making electronic bookings available through GPs, as well as PCCs, could really improve the service we are able to offer patients.”

Many other ambulance services are now looking to adopt the systems and processes pioneered by NEAS. Steven Pratt observes “Encouraging further system integration is not just about promoting a good solution, it’s about promoting good thought. It is important that healthcare services are thinking about patient care in the right way, and integration is really at the heart of what patient care is about; being able to deliver a quick, appropriate, well-informed response.”

An innovative use of IT has helped NEAS to dramatically improve a vital medical service, and IT will continue to play an vital role in NEAS’ ongoing efforts to realise their vision of ‘right care, right place, right time.’

With more opportunities to instantly send electronic information, in the future it may be possible to look at ways that patients or staff could send images to help with triaging.

“It is important that health-care services are thinking about patient care in the right way, and integration is really at the heart of what patient care is about; being able to deliver a quick, appropriate, well-informed response.”
DELIVERING CONNECTED CARE ACROSS A REGION
Bradford & Airedale has always faced challenges when it comes to healthcare. The diverse population, spread across a varied landscape, presents difficulties when trying to deliver connected healthcare.

Bradford & Airedale is the 4th largest metropolitan district in England. The region covers some 142 square miles, which reports high population density and higher than national average growth (Association Public Health Observatories 2012). The region has significant health inequalities with higher than national average levels of alcohol misuse, diabetes and deaths due to heart disease and stroke (Office National Statistics 2009, APHO 2012). Whilst inner city Bradford has high levels of deprivation and unemployment when ranked against the national average (HM Government 2012).

Yet when it comes to healthcare, clinicians in Bradford & Airedale are some of the most revolutionary in the country. Their aims are simple, they want to understand the needs of their patients better and provide world-class healthcare.

In terms of connected healthcare, the area has had their successes represented in numerous publications including the BMJ, HSJ, and the NHS information strategy itself*.

In the late 90s, a GP practice and the Bradford diabetes service wanted to share information. The driver behind this initiative was to reduce unnecessary admissions to secondary care by managing diabetes more effectively in general practice. The solution to this problem was the implementation of the same centrally-hosted system, SystmOne.

Since then, more and more services have adopted the single system approach. Where a mixed economy of systems still exists, health professionals have instead tried to find new ways of linking data and sharing information.

Dr Shahid Ali, a local GP, and Dr Richard Pope, a diabetologist from Bradford Teaching Hospitals NHS Foundation Trust, have been instrumental in driving change.

“Connected care definitely makes a difference – and we believe that comes from sharing the medical record.”

Dr Ali says: “In our area we’ve recognised that connected care definitely makes a difference and we believe that comes from sharing the medical record. Patients need to be able to see their information through the course of a pathway.”

Dr Pope agrees: “Both horizontal and vertical integration is necessary. Patients need to see a longitudinal record that’s presented to them electronically, but that information also needs to be shared across all services, from secondary care through to GP level.”

Local software companies have now ensured that training on connected healthcare begins early in a clinician’s education. As part of a
medical degree, students attending University now get training on SystmOne, which is used in the area. Each year 1500 students at the University of Leeds and 250 students at the University of Bradford are trained before going on medical placements. This enforces the cultural change, and shows a new way of approaching IT in healthcare.

Dr Pope believes as clinicians, their requirements are very simple: “**We need continuously integrated data, instant communication and the ability to look at a changing care pathway in order to transform care. We need to do all of this together, to be instrumental in changing the way that we work.**”

E-Consultations Project

One of the best successes in Bradford & Airedale has been the introduction of e-consultations - an initiative that has improved care, and saved the NHS thousands of pounds. Lead locally by GP Dr John Connolly and consultant nephrologist Dr John Stoves, the projects was initially piloted for Chronic Kidney Disease (CKD) referrals.

A GP, using SystmOne, sends an electronic task to a specialist consultant who has access to a SystmOne hub, established at the hospital. The consultant can then access the full patient record to view consultation details and the medical history to decide upon the best course of care. An electronic task is sent back to the GP, within a maximum of five days, detailing their recommendation. The e-consultations scheme is helping to reduce unnecessary visits to hospital. For CKD referrals alone, the number of referrals to the outpatient department has reduced by 78% since the scheme began.

Dr John Connolly, GP lead at The Ridge Medical Practice in Bradford says “Consultants can make better decisions with access to the whole record and it consolidates their working relationship with GPs.”

The hub is now used for a range of activities, including hepatitis B vaccination monitoring. The percentage of haemodialysis patients in the area who had completed a full course of HBV vaccination increased from 42.8% to 70.9% over a two year period. The mean cost per patient is estimated at £83 for an electronic referral and at £236 for a paper referral, as shown in tables 1 and 2.

TPP are now collaborating with NHS clinical innovators in an agile and responsive way. This promises to deliver the e–Consults model to all SystmOne GPs regardless of geography. When the patient doesn’t have to travel to the specialist, advice can be given wherever and whenever it is needed in a highly cost–effective way.

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### Table 1

<table>
<thead>
<tr>
<th>Input</th>
<th>Unit Cost</th>
<th>Mean cost per referred patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP referral</td>
<td>3 mins</td>
<td>£150 per hour</td>
</tr>
<tr>
<td>Consultant time E-consultation</td>
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<td>£148 per hour</td>
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<tr>
<td>Outpatient attendance</td>
<td>Attendance for 16% of patients</td>
<td>£225 per attendance</td>
</tr>
<tr>
<td>Transport</td>
<td>17% of attending patients requiring NHS transport</td>
<td>£32 per attendance requiring transport</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>£83</strong></td>
</tr>
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</table>

### Table 2

<table>
<thead>
<tr>
<th>Input</th>
<th>Unit Cost</th>
<th>Mean cost per referred patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP referral</td>
<td>8 mins</td>
<td>£150 per hour</td>
</tr>
<tr>
<td>Outpatient attendance</td>
<td>Attendance for 94% of patients</td>
<td>£225 per attendance</td>
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<tr>
<td>Transport</td>
<td>17% of attending patients requiring NHS transport</td>
<td>£32 per attendance requiring transport</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>£236</strong></td>
</tr>
</tbody>
</table>

The saving to the NHS per patient for using electronic referrals is estimated at £153.
Dr Shahid Ali from the Phoenix Medical practice, worked on an initiative to change the way patients with long term conditions (LTCs) were dealt with. Patients with one or more LTC were allocated to groups which were then given special clinic times. Longer clinic appointments were given to those with two or more LTCs and all goals and discussion points were added to a personalised plan of care within the practice’s clinical system, SystmOne.

Results from Dr Ali’s study have shown reductions in practice contact, outpatient appointments and A&E attendance. All of this means there is a significant reduction in cost when comparing treatment methods. Acute admissions for the patients involved in the study cost just £5,000 after care planning compared to over £30,000 pre care planning.

Yorkshire and the Humber SHA have also taken time to implement the customised SystmOne templates for patients with Long Term Conditions, making them a standard across the SHA. This means all data, across all services, is recorded in exactly the same way. Julia Coletta, Long Term Conditions Lead at the SHA says “The feedback from patients has been great! They feel their condition is more manageable and feel that they have become an equal partner in their own care. Patients may have multiple long term conditions which need to be monitored and these templates are a great way of ensuring this.”
Dean Davidson, Programme Coordinator from Bradford District Care Trust reported that the recent integration projects within the trust have been hugely beneficial in supporting integrated care: “It’s very beneficial to be able to send and receive electronic summaries at key points in a patient pathway. However, a fully integrated electronic record would enable clinical staff to be able filter through the data, locate the appropriate information and make a decision based on the information you have.”

The staff working across Bradford & Airedale are keen to let people know that what they have achieved really does work. Dr Ali says: “There’s no aspiration here – what we’re doing is already in place and working. We’ve moved on, we’re no longer guessing about how to treat patients and what methods might work.”

Senior staff members working in the region have a responsibility to ensure that everyone is committed to the connected health ethos.

Although working with a shared electronic record – and communicating electronically – is a different approach, it’s one that only needs a minor cultural change.

Dr Pope says: “Seeing really is believing. There are still a lot of clinicians who are sceptical or worried about sharing the record but once you show them how much time it will save them – and how it will improve the care you offer patients, they are immediately convinced.”

An example of a single change that’s made a big difference is a change that’s been made by the Bradford and Airedale health community for referrals.

Instead of asking the GP to create a full ‘Electronic Referral’ to the care trust (including Referral Page, Word Letter Template, Share and Task) the trust now only asking them to complete a single referral form and then ‘Share’ the record electronically with other staff. This has saved hours of clinical time and reduced duplication dramatically.

Since Airedale Hospital deployed SystmOne (the same system platform that’s used predominantly in primary care) there’s been a step change in the way care is delivered. Richard Pope, a consultant at Airedale says: “For the first time we have true vertical integration in healthcare. The consultants in the hospital get to see a full primary record for their patients, and then, in turn, the GP is informed of a patient’s stay in secondary care.”

Functionality built into SystmOne also allows staff at the hospital to view the Summary Care Record of patients whose record is not stored on SystmOne. For other patients whose records aren’t stored in the same system, links via DTS messages and ADT means information can still pass between primary and secondary care.

A future integration between TPP and EMIS will also mean services using SystmOne will be able to access data held in EMIS systems.
and vice versa, giving clinicians access to more information, exactly when they need it.

Bradford and Airedale health community have recently deployed the SystmOne Clinical Record Viewer from TPP in order to supplement the CSE Healthcare Systems Rio service they use within the mental health setting. This licence–free service from TPP is deployed alongside an existing system to give clinicians access to a read–only view of the full SystmOne patient record. It also allows them to access the SCR of any patient not on SystmOne.

This means mental health professionals in acute care can have a more holistic view of a patient’s record and feel they are fully informed when making a decision about patient care.

Bradford Royal Infirmary are also due to deploy the CRV by May 2013, alongside their existing PAS, iPM. Integration between these two systems, via ADT, will mean GPs are notified when their patient records are accessed and electronic discharge letters can be sent electronically.

A separate project at Bradford Hospital has also been established between GPs and pharmacy. A quality improvement initiative designed jointly by John Connolly (GP) and Carol Aitken (Hospital Pharmacist) has exploited shared electronic records across organisational boundaries by training hospital pharmacists at the hospital to enter details of changes in long term medication directly into SystmOne when elderly patients are discharged from an episode of care.

### Telehealth

**Teleconsultation** involves the use of video links between patient and care giver, allowing specialist input to patients without the need for either clinician or patient to travel. Airedale hospital has been at the forefront of the development of this innovative approach for over 7 years and currently operates a 24/7 Digital Healthcare Centre which is supporting patients at a range of locations across England.

Airedale’s work began in the prison health field. Transferring patients to hospital from prisons is both costly and risky, making it difficult for patients who are in prison to obtain some specialist input. The ability to offer instant specialist care advice using video offers substantial clinical benefits to the patient and operational benefits to the prison healthcare team. In up to 50% of cases referred, the patient no longer needs to leave the prison for further care. The programme has been successful and is now operating in 20 prisons, from those in the North of England to the Isle of Wight. The service uses the SystmOne prisons application which is in use across all prisons in England.

Use of shared electronic health records has also played a key role in the Trust’s other developments. Patients with long term conditions such as heart failure or chronic chest disease are supported in their own homes using video links that are delivered via the person’s television, using a set top box and attached webcam. The confidence that results from knowing that expert support is immediately available has led to a 30% reduction in hospital admissions and a 36% reduction in the length of stay for those admissions that are needed from this group of individuals.

Large numbers of older, frail individuals are today cared for in residential and nursing home settings. When residents are admitted to hospital, they often become disoriented as a result of the change in their normal environment and routines. Staff from the care home need to accompany them to hospital, depleting the remaining staff numbers at the home. By using mobile video consultation systems, Airedale’s team is able to see and speak with residents in their own room, who can be supported by their normal care team and yet still receive the clinical assessments and advice they need. Operating in over 30 care homes, this service is expanding rapidly and is highly valued by patients, their families and the care home staff. Studies of the results obtained to date show that there has been a relative reduction of 50% in hospital admissions in areas where the teleconsultation is in use – and that attendances at the hospital’s emergency department has reduced in relative terms by 78% by comparison with homes that do not have access to the video services.

These 24/7 services rely on SystmOne to enable the critically important communication to and from clinical staff in both primary care and community sites – both to other SystmOne users and by using DTS messaging, to users of other clinical software systems.
of inpatient care. This alerts GPs more reliably
to changes needed in regular medications lists
and reduces the risk of medication errors. This
initiative has been shortlisted for the finals of
the 2013 Patient Safety Awards.

Bradford & Airedale have also saved a
significant amount of money over the last 18
months through a unique integration between
SystmOne and their radiology system, CRIS.
Previously, the radiology department delivered
radiology results in person to GP practices.
With all GP practices using one system it was
easier to develop a method of sending results
electronically from the hospital.

HL7 messages deliver the result between
SystmOne and CRIS almost instantly. SystmOne
then sends an acknowledgement back to the
radiology department to create a secure loop
of communication.

Once the result is filed to the patient record, it
can be shared with any service caring for the
patient. TPP provided this integration to the
Trust free of charge.

Dr Connolly, a GP recipient of the new
electronic radiology reports, said: “This
development has reduced significantly the
time which patients and their GPs wait for
important examination results with definite
benefits for patient experience and safety.”

The future for Bradford & Airedale

The future for Bradford and Airedale involves
building on the success described above and
taking integration of records to the next
level by embracing joined up working with
colleagues and carers in other sectors including
social care.

They also want to involve patients themselves
as partners in their care, through the patient
on-line access initiative. They also hope to take
advantage of business intelligence tools that
will come from TPP's ResearchOne database –
an anonymised data collection that can be used
to identify trends and highlight risk.

Dr Richard Pope says: “Ideally, we’d like to get
everyone on the same system, but we know
that’s not always achievable. In the meantime,
we’ll work to connect as much data as we can,
ensuring the patient always remains the focus –
ultimately, patients want connected care.”
A big issue in health care and research is access to information, and shared Electronic Health Records (EHRs) offer a fantastic solution to this. To address this need for data TPP, the system supplier responsible for the clinical system, SystmOne, and the University of Leeds have collaborated to create the not–for–profit organisation, ResearchOne. ResearchOne enables 30 million shared patient records to contribute to research that develops clinical understanding and tools, and works to feed these back into clinical practice.

Two years into the collaboration, ResearchOne has already supported many research and public health monitoring projects. These include delivering an electronic system for notifying the Health Protection Agency of infectious diseases, monitoring the impact of vaccinating pregnant women against whooping cough, and providing data to a long term research study in Bradford.

ResearchOne now has national level ethical approval from the NHS Research Ethics Committee (REC) and National Information Governance Board (NIGB) to deliver de–identified data from consenting SystmOne organisations to research projects. This is an incredible leap forward in promoting the accessibility for patients, clinicians and researchers to work together to improve clinical care.
Through clinical research, ResearchOne can directly contribute to the way patient care is delivered. This can range from identifying high risk groups, looking at the effectiveness of certain treatments, or providing insight into how care can be effectively delivered. For example, ResearchOne has been involved in a study looking at whether there is any correlation between the use of calcium supplements and a higher risk of a cardiovascular event, such as a heart attack. This research will be invaluable in making sure patients are given the most appropriate treatments.
Vascular diseases affect both young and old and can cause heart attacks and strokes. In many cases, elements of an unhealthy lifestyle such as smoking, poor diet, lack of exercise, and stress contribute to their development. Making simple changes to lifestyle can significantly reduce the risk of a stroke or heart attack, as well as improving overall health and well-being.

An additional problem is that many people require medical treatment to manage their condition and to reduce risk factors such as high blood pressure. It is often the case that people do not stick to their advised medical regimes and therefore put themselves at higher risk.

The IMproving PRevention Of Vascular diseasE in Primary Care (IMPROVE-PC) project is investigating why people do not follow their clinician’s recommended treatment plan and looks to improve uptake and adherence to their medical regimes. The study also identifies high risk groups for vascular disease and devises ways for people to change their lifestyle before their health is irreversibly compromised. It will consider the barriers to making these changes, such as low income, and how best to support people in leading healthy lives.

IMPROVE-PC gathers both qualitative and quantitative data about vascular disease. ResearchOne has supplied consented, de-identified records information from SystmOne and helped IMPROVE-PC to pseudonymously link this to information from Hospital Episodes Statistics (HES) and the Myocardial Ischemia Audit Program (MINAP). Linking data in this way across primary and secondary care provides opportunities to study care management in Cardio-Vascular Diseases (CVD) and identify optimal patterns of care.

In many cases, CVD patients may have treatments in both primary and secondary care, but often these secondary care episodes are not fed back to GPs. The study will help to quantify this issue and look for areas of high prevalence. By improving this communication, clinicians and patients can have a more holistic view of the patient’s care. The goal will ultimately be to reach a point where this record is accurate and up to date to the extent that patient care can move into more comfortable and cost-effective community settings where patients can be more actively involved in the management of their condition.

Steve Magare, the Data Manager for the project, commented that a centralised system helps clinicians and researchers to access important information recorded in other organisations. “The availability of patient records data has always been seen to be the missing link and the development of ResearchOne will allow research projects such as this to realise the full potential of using linked data to improve healthcare in an efficient and cost effective manner.”
ResearchOne not only provides data that can be used in clinical studies, it is also contributing to the wider NHS goals of increasing efficiency, adhering to clinical guidelines and respecting patient confidentiality. These studies play an important role in making sure that research is always conducted in keeping with best practice, and also in highlighting ways the NHS can improve the services they deliver. Some examples are:

**GP NON-ATTENDANCE**

This project is examining the link between factors such as rurality, appointment time, and appointment booking method with non-attendance at appointments. Did Not Attends (DNAs) are an on-going problem for many care providers, wasting time and valuable resources. There are also wider implications, such as for mental health patients, where missing appointments could indicate a deterioration in the patient’s condition.

De-identified clinical and demographic data from the ResearchOne database is used in data mining explorations to identify any trends with non-attendance. The aim is to develop a clinical decision support system to identify and address risk of non-attendance. This will hopefully reduce the number of DNAs to ensure an efficient service and that patients are receiving appropriate care.
PATIENT PRIVACY IN RESEARCH

E-HEALTH GATEWAY TO THE CLOUDS

ResearchOne has enabled access to health records information in order to develop a tool that will help to maintain privacy, and support best practice in research. The e-health GATEway to the Clouds project is developing a research tool to anonymise free text data from health records. This data is then embedded within a secure cloud-based Virtual Research Environment (VRE). ResearchOne have extracted data from fictional but realistic records, created by medical students on SystmOne, to enable the researchers to pilot the tool securely.

Since 2008, over 3,000 medical and healthcare students at the University of Leeds have received education on the use of clinical systems, through hands-on use of SystmOne, to simulate real patient consultations. Identifiable information such as a patient or clinician’s personal details can be removed so that researcher can work with the valuable health information in health records while respecting patient confidentiality.

MEETING CLINICAL GUIDELINES – ASPIRE

It is essential that research evidence translates into clinical practice. The collaboration between ResearchOne and Action to Support Practices Implementation of Research (ASPIRE) group is working to support general practices in implementing the evidence-based clinical care recommended by the National Institute for Health and Clinical Excellence (NICE) clinical guidelines.

For example, for patients suffering with Chronic Kidney Disease, NICE guidelines set a minimum guide for how many patients should have a blood pressure result and various urine ratios recorded in the last 15 months. They have also stipulated that these patients should be given advice to take exercise, achieve a healthy weight and stop smoking. ResearchOne data would be able to show whether practices were meeting these quotas, and if not, the research groups can look at how to implement solutions to make sure patients are receiving the best level of care.

This five year project is working with 60 practices in West Yorkshire that use SystmOne and is monitoring the impact and adherence to NICE guidelines. These practices contribute de-identified data to the project through ResearchOne. The ASPIRE team is then analysing and interpreting this data. Their findings can be used to develop an intervention package, based on audit and clinical decision support systems, with the aim of supporting guideline adherence. Robbie Foy, Clinical Professor of Primary Care at the University of Leeds said “ResearchOne will help us improve the quality and relevance of research in primary care by providing regulated, approved access to large-scale pseudo-anonymised data. This will enhance our ability, for example, to monitor the uptake of evidence-based practice and evaluate the impact of interventions to improve practice.”

The impact of the interventions will be evaluated using further extracts of de-identified practice data through ResearchOne and interviews with the practices.
In a short time, ResearchOne has made significant contributions to the medical research community. The ability for SystmOne practices to opt-in to sharing data will provide new and exciting opportunities for studies across larger populations and will help to reveal national trends, as well as allowing localised research projects. Through ResearchOne, more people, both clinical staff and patients, are having the opportunity to contribute to medical research that can in turn shape the healthcare landscape across the UK.
ResearchOne

For more information please contact
Samantha Crossfield at enquiries@researchone.org