The Chief Scientific Officer (CSO) is head of profession for the 50,000-strong healthcare science workforce. The workforce provides the scientific backbone of NHS and public health services, working across the four divisions of laboratory (pathology) sciences, physiological sciences, physical sciences and engineering and bioinformatics. Their work underpins 80% of all diagnoses and they make a direct contribution to treatment pathways, particularly in specialist services such as cancer and cardiovascular disease.

NHS England’s ambition is to ensure the delivery of high quality care for all, now and for future generations. Scientific and diagnostic services are central to this ambition, not least through supporting the delivery of the NHS Five Year Forward View. We need to influence and work with patient groups, commissioners and providers to co-create new models of care, and operational priorities and change enablers to drive efficiency and transformation.

As part of NHS England, the CSO’s team leads on a range of key priority areas:

- driving forward the commissioning of high quality, innovative patient-centred diagnostic and scientific services to support the delivery of new models of care and the Five Year Forward View
- providing leadership and scientific input to specific projects that will deliver improved, sustainable care for patients
- developing the professional capacity and capability to deliver whole system change
- providing broader scientific and diagnostic leadership and science-based intelligence.

‘The Forward View into Action: Planning for 2015/16’ is clear on the approach to be taken to partnerships and planning, creation of new relationships with patients and communities, co-creation of new models of care, and operational priorities and change enablers to drive efficiency and transformation.

The new national CSO Quality Improvement Champions Group (QIC) brings together key healthcare scientists from across the country who are delivering change right here, right now to support the New Models of Care national programme for NHS England. The group is chaired by Keith Pearce and Fiona Carragher, Deputy Chief Scientific Officer, represents the CSO.

This brochure contains a selection of case studies submitted by the membership of the QIC group to promote their contribution to transforming healthcare science services out in the community and ultimately improving patient care.

We know there are many more examples out there so please get in touch so we can add your examples to our library, and if you would like to join this national expert panel as a Quality Improvement Champion please contact Helen Liggett, Scientific Project Lead for Quality Improvement (Chief Scientific Officer’s team, NHS England helen.liggett@srft.nhs.uk)
Fiona Carragher
FRCPath EuSpLM CSci
Deputy Chief Scientific Officer for England
Fiona Carragher is the Deputy Chief Scientific Officer for England, supporting the head of profession for the 50,000 healthcare scientists in the NHS and associated bodies – embracing more than 54 separate scientific specialisms.

A Consultant Clinical Biochemist by background, Fiona has a broad portfolio of policy responsibilities, providing professional leadership and expert clinical advice across the health and care system as well as working with senior clinical leaders within both the NHS England and the wider NHS.

Fiona has a strong background in both public health and treatment & care, having led and worked in multi-professional teams for two decades at Guy's & St Thomas’ Hospital, the Royal Hospital for Sick Children, Edinburgh and Kings College Hospital, London - with a focus on providing high quality, innovative laboratory services. Most recently she led a number of specialised laboratories for the diagnosis and monitoring of inherited metabolic disease and was Director of Newborn Screening for the South East Thames Region.

As Scientific Director for London she led a number of broader healthcare science projects including technology adoption and leadership development, and created a proactive scientific and diagnostics network across the capital that supports quality improvement and effective commissioning. She is a Fellow of the Royal College of Pathologists and is a member of multi-professional organisations such as the Association for Clinical Biochemistry and Laboratory Medicine and British Inherited Metabolic Disease Group.

Mr. Keith Pearce
Chair of Quality Improvement Champions Group
Keith is a Consultant Cardiac Physiologist at the University Hospital of South Manchester NHS Foundation Trust (UHSM) where he specialises in echocardiography with a focus on stress echocardiography and heart valve disease surveillance.

Keith strives to continuously extend the role of cardiac scientists within healthcare and has been successful in driving the development of cardiac physiologists in the cardiac magnetic resonance arena in an attempt to ensure a true multi-modality imaging portfolio for the cardiac scientist. In addition, Keith acts as the joint Clinical Governance Lead within the echocardiography department and drives a robust quality assurance system within the echocardiography laboratory at UHSM.

Keith is the Vice President of the British Society of Echocardiography (BSE) and chaired the BSE Accreditation Committee 2010 - 2014. He is a member of the BSE Council and represents the BSE as the lead for the National School of Healthcare Science (NSHCS). He acts as a lead station writer for the generic and echocardiography speciality Objective Structured Formal Assessment (OSFA) on behalf of the NSHCS as part of the Scientist Training Programme (STP) within the Modernising Scientific Careers programme.

At the 2015 Advancing Healthcare Awards Keith won the category “Inspiring the Workforce of the Future”.

A specialist service within Audiology for adults with complex needs who are unable to complete a hearing test in mainstream services. Despite a hearing loss prevalence of at least 40% for this group, adults with complex needs are more likely to experience barriers to assessment and treatment.

The service was developed using the 3As model - Access, Assessment, Aftercare; an award winning model, designed by the team lead. However, improvements using the 3As framework began to plateau and further research led to a 5As model - Access, Assessment, Aftercare, Assembly, Awareness, which now reflects the need for multidisciplinary involvement and collaboration.

Training for caregivers increased diagnosis and treatment of hearing loss and created “Hearing Champions” within the community. Our local complex needs multidisciplinary team provides links between primary and secondary care and community teams.

Prior to creating the specialist service, few adults with learning disabilities ever visited Audiology. Many in the community didn’t think hearing tests would be possible for this group or that people with learning disabilities would benefit from hearing aids.

Though the Any Qualified Provider initiative has increased audiology services on the high street, such services are not appropriate for this group due to their complex needs and the specialist skills needed for assessment.

The 5As model aims to make holistic improvements to a service. In addition to improving access, assessment and aftercare, the 5As model seeks to identify and assemble key stakeholders to consider an issue and determine who may need to be involved. In addition, awareness by each stakeholder of others is facilitated by information sharing.

We identified a core team to make up a multidisciplinary team with a special interest. No retraining was required.

Clinically, no new skills were required but we learned to communicate better across professional boundaries, as highlighted by the transition from the 3As to 5As model.

Name of service: Audiology for adults with complex needs
Area covered: North East England
Organisation: City Hospitals Sunderland NHS Foundation Trust
Contact: Lynzee McShea, Senior Clinical Scientist (Audiology)

A continued aim is to overcome initial resistance from primary care. By spending time in the community and interviewing primary care and caregivers a great deal was learned about different roles, barriers and how to address these, by understanding the experiences and beliefs of these key groups.

Following caregiver training, pledges to ‘make a difference’ were made and 94% had been completed 6 months after the training. The estimated prevalence of hearing loss increased from 23% to 54%, with several individuals issued with hearing aids as a direct result, with life-changing effects. Focus groups revealed caregivers also felt more empowered and confident in communication and seeking referral via primary care. Training has been delivered to over 120 caregivers so far and long term it is hoped it can be accredited and delivered for the benefit of other carers and the wider healthcare team.

We have been working with Sense (a national charity for deafblind people) to improve their services. In September 2015, the team lead trained “Hearing Champions” for Sense. Referrals to our Audiology service have increased significantly. Diagnosis of hearing loss has been significant for many and the service developments are being used to contribute to the writing of best practice guidelines for adults with learning disabilities, produced by the British Society of Audiology as well as involvement in further research in collaboration with the University of Sunderland and NHS England.
The diagnostic workforce helped design this service and to drive the standard of care. They needed reassurance that their skills could be delivered outside of a hospital setting so within the department we discussed, designed and continue to review the service delivery.

Staff pride is enhanced and there has been a positive impact on their knowledge and confidence in their own ability.

We aimed to redesign the patient pathway to deliver a service closer to the patient’s home and improve access to expert opinion (not just access to the diagnostic testing) if and when required.

GP surgeries wanted to improve the standard and quality of primary care diagnostics, using high quality assured operators and information around the identification of the pathology, with a clear outline of how this will be managed.

The diagnostic workforce helped design this service and to drive the standard of care. They needed reassurance that their skills could be delivered outside of a hospital setting so within the department we discussed, designed and continue to review the service delivery.

Staff pride is enhanced and there has been a positive impact on their knowledge and confidence in their own ability.

We provided echocardiography services within the setting of a GP practice. UHSM staff travel to the practice to deliver a high quality echo service, locally archiving images and transferring any which require cardiology review or opinion back to the hospital. Any significant pathology identified can be reviewed and outpatient appointments offered at UHSM without the need for repeat diagnostic testing. The clinical governance of the staff providing the service is undertaken by UHSM as all staff work on a rotational basis out in the community and within the hospital setting.

Existing technology was utilised although further investment in up to date echo systems and appropriate examination couches has been made since commencement of the service.

After initial concerns about the sustainability of the service, there is now strong managerial and clinical support for expansion based on the clinical model adopted.

Staff on site at the GP practice were initially cautious about a service delivered by hospital staff but are now highly supportive.

GP do not want to have a report which tells them they have to make a referral to somebody else. This delay has been removed and as such expedites treatment for a patient’s condition.

Having helped to design this service the staff now all drive the standard of care, take responsibility for the patients they see and feel empowered to be involved in clinical decision making.

The staff have designed a service which mirrors the environment and standards of the echo lab within the tertiary unit within a community setting, which was one of our aims.

**Name of service:** Cardiac Diagnostic’s “Echocardiography”  
**Area covered:** South Manchester  
**Organisation:** University Hospital South Manchester  
**Contact:** Keith Pearce, Consultant Cardiac Physiologist
THE CHALLENGES

The amount of estate required will increase from a single room and waiting area to five rooms for testing, dosing area and an examination / treatment room.

Leadership challenges included working under multiple CSUs and engaging management from all three areas. Time was needed to facilitate the use of community sites and encourage a positive understanding of the changes with current staff.

Additional funding, changes to IT and connectivity and staff recruitment were all helped by additional project management support from an external source.

THE WORKFORCE

Expansion of the phlebotomy team includes:

• Creation of a band 5 pharmacy technician role
• Creation of Band 6 and Band 7 Anticoagulant Nursing roles
• Additional Band 6 BMS staff
• Employment of a band 4 phlebotomy team leader

Training is needed in the use of PoCT equipment for capillary testing, staff are attending the Birmingham University Anticoagulant Practitioners’ course and education regarding NOACs has been enhanced.

THE OUTCOMES

Measures used to track the impact of these changes include:

• patient satisfaction / PALS complaints / Friends and Family test data
• numbers of INRs / doses per quarter
• NPSA indicators
• benchmarking via the DAWN AC Benchmarking Scheme
• Improvement in time in therapeutic range (TTR) for patients on vitamin K antagonists
• Increase in the number of patients prescribed Direct Inhibitor Oral Anticoagulants (DOAC)
• Implementation of a patient self-testing (PST) pilot
• staff feedback.

The new service model is still being implemented so we are currently looking at measuring changes. The hub site went live in June 2015. Transition of the new community model is expected to be completed by May 2016.

ABOUT THE SERVICE

The Leeds Anticoagulant Service was commissioned in 1996 for 4000-5000 patients as the only warfarin dosing and monitoring service in Leeds. The service has grown to cover more than 10,000 patients and numbers are expected to increase to excess of 15,000 patients. Current workload is around 2700 tests / doses per week and could rise to over 4000 tests per week.

The new model utilises a larger workforce comprising support staff, biomedical scientists, pharmacists and nurses deployed on a hub-and-spoke model. Teams of staff attend community clinics utilising near patient testing (NPT) technology and networked computers to return results and dose advice to patients in real time.

An anticoagulation hub has been established at Beckett Wing on the SJUH site to allow access to the VTE team, specialist coagulation, pharmacy and clinical haematology expertise. Face to face clinics run daily.

Patients presenting with very high INRs (at risk of bleeding) or very low INRs in high risk cases (at risk of clots / stroke) can be triaged by a nurse, and where necessary warfarin reversal or heparin injections can be initiated at clinic.

Home visits will move from a venepuncture sample dropped at local GP surgeries to Point of Care Testing (PoCT) to provide parity of service with community and hospital clinics.

WHY CHANGE?

Currently, patients at risk of bleeding need to attend an oncology ward for reversal of their anticoagulation. By the time they have been treated and arrived home again, it could be 18 hours after their blood sample was taken. The new model could turn this around in 30 minutes.

Utilising nursing staff allows the service to be more clinically responsive. The existing model relies on clinical pharmacists and a registrar available by bleep for any issues.

The service aims to improve patient experience, offering a rapid 10 minute turnaround of results and dosing information in clinic. Some patients can be treated at home with vitamin K reversal instead of coming to hospital.
The Hull Clinical Commissioning Group (CCG) announced plans to provide a new concept – The Hull Integrated Care Centre (HICC) – to be in place by 2018. This project is designed to assess, treat and support (particularly elderly) patients in a localised scenario rather than admit them to hospital as well as providing a ‘halfway house’ type environment to enable earlier discharge from hospital where clinically appropriate.

Pathology services will be involved in the diagnostics and ongoing assessment areas of the new venture. There will be a need to provide an onsite facility for the service providers at the HICC to obtain all the necessary pathology testing they require to make clinical assessments and monitor treatments.

Pathology at the trust has been in talks with the commissioners of the HICC since January 2015 in order to ascertain the scope and depth of pathology provision required. As a result, when the HICC goes live we plan to provide the exact service that the users require in the most efficient manner available – as opposed to responding ad hoc to any requests we may have received post-build.

In an area with an ageing population, the HICC will provide much needed relief to the problem of inappropriate and unnecessarily extended hospitalisation of patients. It will also enable primary care provision of certain diagnostics instead of referral to hospital based services. The provision of rapid turnaround Pathology services are an essential part of the onsite diagnostics services necessary for this type of healthcare environment.

As the service has not started yet, we cannot document any workforce or skill changes necessary.

Services are likely to include Point of Care Testing (POCT) and traditional pathology testing requiring fast-track transportation of samples into the laboratories and electronic transfer of results back to the HICC.

This will require planning and funding and early dialogue with the commissioners is vital to ensure adequate resources are allocated to the pathology arm of the diagnostics.

By engaging in a direct line of communication with service commissioners before a brick is laid there is a much greater chance of the CCG getting the pathology service they want when the service opens and a much more accurate assessment of the costs associated with that.

Pathology will be auditing both POCT and conventional laboratory service use when the service starts and will continue to discuss with service commissioners and users on an ongoing basis to flex services as necessary. Turnaround times will be monitored on a regular basis.

Name of service: Hull Integrated Care Centre
Area covered: Hull & East Yorkshire
Organisation: Hull and East Yorkshire Hospitals NHS Trust
Contact: Steve Hatfield, Pathology Innovation Manager
ABOUT THE SERVICE

BOQAS is a business venture within an NHS Trust. It distributes blood samples to high street pharmacies, GPs/ NHS clinics, health centres, supermarkets and invites them to analyse and report back the cholesterol level measured on their desk top analyser. The scheme then advises individual clients whether their results are in agreement with all others. Through monthly distributions a profile builds up of accuracy and reliability.

Uniquely BQAS distributes blood rather than serum so as to mimic the finger prick samples analysed on the High Street. This gives a truer reflection of clinical performance. Issuing blood has also allowed us to add HbA1c to the scheme - the front line diagnostic test for diabetes that cannot be measured on serum. Thus, clients now get multiple tests from one scheme that supports the needs of NHS Health Checks.

WHY CHANGE?

Our drivers were:

• To improve accuracy and reliability of diagnostic testing on the high street
• To provide an evidence-based system for reporting performance/quality to commissioners
• To support clients in meeting CQC requirements for delivery of high quality care.

The service fills a gap in the emerging ‘high street’ diagnostics market with simple to understand “Go/No Go” reports. This helps analysts determine whether they are providing safe care for their patients.

THE WORKFORCE

Skill sets have evolved to include business development acumen, marketing and communication skills, and a new understanding of QA needs appropriate to the high street as opposed to a secondary care pathology laboratory.

THE CHALLENGES

A key challenge was learning how to build an income generating business venture premised on understanding that the QA needs of the high street analyst are different to a hospital setting where exquisite levels of test accuracy are needed for differential diagnosis and tailored patient management.

On the technical front, design of a bespoke electronic communications system and procurement automated technology have taken the team outside the bounds of their usual comfort zone.

THE OUTCOMES

The scheme has grown from 20 clients in 2007 to 2000 in 2015, the biggest cholesterol testing scheme in the UK.

The latest user survey shows that 97% of respondents rated the service as excellent or good and 98% would recommend the scheme to others.

The improvement in clients’ performance is measured through standard deviations and the overall variability for the three types of analysers on the scheme has reduced from a coefficient of variation of 27.4% in 2011 to 15.9% in 2015.

The service is expected to evolve and grow further as new tests such as creatinine and INR testing for anticoagulant management are added over 2016/17.
Chime span out of the Devon PCT on 1st May 2011 as a social enterprise. We have a contract with Devon CCG to provide the full range of NHS audiological services.

We have always endeavoured to take the service to the patient rather than expecting them to come into the acute site and we offer the service at 13 different locality settings in Devon.

Under Any Qualified Provider (AQP) we have had commercial competition for adult hearing aid patients – a challenge to maintain throughput at the highest quality levels across a wide geographical area. We achieve this without taking profit out of the system.

We developed a business plan to identify and develop a high street premises in Exeter, which has now opened – three rooms dedicated to NHS pathways and one room for commercial sales. We are able to offer our traditional excellent service at very competitive prices for commercial patients too.

We initially set up a social enterprise so that we could control our own destiny, and to reinvest all efficiency savings into service development.

By developing a plan for a high street location in Exeter, we wished to further improve convenience for the patient, increase capacity to meet demand and utilise potential income to buttress the free at the point of delivery and provide second-to-none NHS services.

We set out to showcase an NHS venue that is unique in its shopping centre location and design, offering innovative assistive devices, for example via Bluetooth, at competitive prices.

A change of ethos has developed over the years since the move to staff ownership. All understand that through our efforts we can achieve efficiency savings and lean pathways to reinvest in the service.

Conversion courses and immersion in new skills such as marketing were achieved through careful selection of the right director to provide these skills part time.

There were a number of challenges associated with the commercial aspects of launching a social enterprise, including data analysis and business planning, sourcing support organisations and finding suitable premises.

Securing investment and broad support also required significant management time.

We have greater control over budgets and the hearing solutions offered to patients. We have improved the patient / customer experience and have a direct relationship with commissioners.

The high street outlet is open six days a week and we are also selling, at the most reasonable rates, equipment that for example, allows Bluetooth connections between mobile phones or TVs and our sophisticated NHS range of hearing aids.
Point of Care (POC) INR testing has been increasing in UK over the last 2 decades and maintaining the quality of the INR test is just as important for a POC user as it is in the laboratory so we developed a programme just for POC testing devices. The programme has grown from around 100 users in 2000 to over 4500. We send lyophilised samples 4 times per year to POC testers and they test on their device and return results. These are analysed and we report back to the users to say whether their tests were within the acceptable range. The same criteria that are used in our laboratory programme are followed. The samples are sent in a way that no laboratory equipment is needed.

Over the years we have changed how we report to these users so that the POC users report is more simplified than the laboratory users. We have also changed the labelling of the samples and have introduced a colour coded lid system to help users to test the samples in the correct order.

We have a diverse group of POC users including GPs, primary care nurses, secondary care nurses, health care assistants, health workers in prisons and some dentists. 80% are in a primary care setting.

**WHY CHANGE?**

The driver for this was the growth of this test among primary care users. POC device manufacturers are continuously developing new machines for use in primary care. We felt strongly that they should be subject to EQA in the same way as a laboratory would be, so users can be confident in the results they provide.

There has been an increased workload due to this larger user group which also requires greater support and contact by phone or e-mail.

**THE WORKFORCE**

In 2000, one part time staff member provided this service and we have since employed a further 2 BMS to the department and some of their duties are to help with this work. At the same time we have also increased our clerical staff numbers.

We needed to improve communication skills to enable our staff to liaise with the non laboratory trained health care professionals who provide these tests, to ensure these users got the best from the service we provide.

**THE OUTCOMES**

The service has grown to meet demand and we have seen other countries introducing this type of service. We are consulting with some to help them set this up.

We have a high volume of contact with our users to support them with their testing, and regularly do participant questionnaires to gain their views.

The POC group of users are very diverse with some being well versed in INR testing and others knowing very little. We have become more educational providers. As well as our annual users meeting for the laboratory group we have a biennial conference focussing around INR provision and aimed at our POC users. This conference has been in various location around the country.

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**Name of service:** POC INR EQA programme  
**Area covered:** National  
**Organisation:** UK NEQAS (National External Quality Assessment Scheme) for Blood Coagulation  
**Contact:** Dianne Kitchen, Lead Scientist for Point of Care programmes
Patients in an intermediate care home who are on warfarin have their INR monitored by a point of care testing (POCT) device rather than travelling to the hospital.

The patient has a finger-stick performed by an intermediate care team member who measures the INR on a POCT device. The team member enters the result obtained on the DAWN anticoagulant patient record system. From here, the results are reviewed by the anticoagulant specialist nurses in the acute trust who then advise on any dose changes. This partnership between acute and intermediate care ensures the patients still receive expert review from the anticoagulant team.

Why Change?

Many patients in intermediate care are elderly, frail or confused. Previously, these patients travelled by ambulance to the acute hospital to have their INR checked. It was not possible to coordinate the ambulance journeys with an individual patient’s appointment times. Therefore, patients sometimes arrived well in advance of their appointments or would have to wait for a long period after their appointment for the ambulance transport back to intermediate care.

The long waiting time in a busy urban outpatient department was bewildering and frightening for some patients. Furthermore, their care was compromised as they could miss meals or not receive routine medication at the intended times.

We aimed to improve the patient experience and quality of care, while improving efficiency of service and productivity due to fewer ambulance journeys.

The workforce

The acute care point of care testing team trained the intermediate care team to use the point of care testing INR device. An assistant practitioner in intermediate care performs most of the POCT INR tests and liaises with the point of care testing team for support, supply of consumables etc.

The challenges

Enabling the necessary IT links was the biggest challenge. There was strong support from all parties for the change.

The outcomes

The overall outcome reflected our initial aims, by improving the patient experience and reducing ambulance journeys. The quality of the POCT service (analytical and experience) is monitored via routine quality audits.
This is an ongoing process to develop a flexible team which is able to respond creatively to a demand led service. Change management is constant as we are driven by external service demands. In this case roles were spread across technologists in several sections, so that the skill base was broadened.

Medical Physics requires ongoing learning all the time. We needed to spend time training staff newly brought into the service. This required that we implement management systems to co-ordinate three strands of line management to deliver the training and subsequently the service.

Two technologist posts were converted to provide resilience by creating capacity within the Nuclear Medicine and Clinical Engineering Sections to provide 7 technologists who could be trained to deliver a range of services.

As a demand led service, we are required to deliver the changes required by our customers and we receive messages of thanks from users where we have enabled them to deliver their services to patients more effectively. Our customer base has expanded due to the quality of service we provide. However, it has significantly increased the training burden required to ensure a broader team is adequately competent to deliver the services. In the short to medium term this may offset any savings which would otherwise have been made. The benefits may only be realised in the longer term, which requires that the staff group in question have a low turnover.

There were short and medium term negatives and we needed to demonstrate the long term benefits. The training capacity also posed a challenge. The change was implemented before the capacity requirements of the service were fully understood. A more structured approach, possibly with external oversight to provide a wider perspective and customer service requirements would have delivered a more demonstrably robust solution.
New members of staff were recruited and trained and staff working on previous PCT contracts were reallocated.

It was necessary to adapt our traditional hospital based system of working to off site working, and to develop the resources to manage this project.

Some specific training for community type equipment was needed and there was a requirement for training when entering secure psychiatric areas and prisons.

Developing a strategy for managing contract changes and scheduling many off site premises posed a challenge.

Monthly KPIs are reported to the LCFT tracking progress with maintenance, response times and activity.

Services delivered in this way are a new development because of the move to providing more care away from secondary care. In the past there was a minimal amount of equipment in the community but as technology has developed and care moved out of hospitals we are finding more complex equipment.

Our service has grown to include other healthcare organisations and charities.

Previously, the service was in a primary care setting but was patchy and on a smaller scale. A 5 year service level contract was agreed with Lancashire Care NHS FT (LCFT) for the maintenance of their medical equipment over multiple sites.

The contract covers the routine maintenance, repair, acceptance testing and safe disposal of equipment and provision of online access to real-time data showing inventories and work progress.

Added value to the contract involves the availability and involvement of experienced medical engineers suggesting efficiencies within LCFT and changes to equipment types to maximise cost savings. In addition, medical engineers have assisted with movements of clinical premises, closing and merging premises and rationalising equipment levels.

Expansion of the LCFT service and lack of available medical equipment management experience created the need for a new service.

As the amount of medical equipment was growing, there were clear opportunities for cost efficiencies and skill sharing in the local healthcare economy

We aimed to improve productivity and efficiency through a ‘Community Team’ of engineers, equipped with particular test equipment and vehicles in order to maximise time on site.

Name of service: Medical Engineering
Area covered: Northwest England covering from South Lakes to Skelmersdale and as far inland as Burnley
Organisation: Lancashire Teaching Hospitals NHS Foundation Trust
Contact: Paul Blackett, Medical Engineering Operations Manager

ABOUT THE SERVICE

WHY CHANGE?

THE WORKFORCE

THE CHALLENGES

THE OUTCOMES

ABOUT THE SERVICE

WHY CHANGE?

THE WORKFORCE

THE CHALLENGES

THE OUTCOMES
Bradford Radiation Physics Services (BRPS) provided radiation protection services to Locala Community Partnerships for:

- the introduction of a podiatric surgery service in a community hospital
- development of Community Dental Services to introduce digital dental radiography

Locala needed to purchase diagnostic x-ray equipment (mini C-arm Fluoroscopy unit) and podiatrists and nursing staff needed to be trained in its safe use. BRPS provided advice on compliance with relevant legislation, equipment procurement, theatre facilities and radiation protection for staff, patients and the public.

BRPS also commissioned equipment, gave initial training on its use, trained podiatrists/surgeons and nursing staff including specific training around the statutory role of Radiation Protection Supervisor and provided necessary documentation.

BRPS staff provide medical physics expertise for diagnostic X-ray for the podiatry and dental services and continue to support both services with QA, QC and monitoring activities. We also keep Locala up to date with changes in legislation and developments in technology.

Changes in podiatry services enabled services to be provided closer to home and to free up theatre time at local acute hospitals. Travel can be reduced for patients, the quality of care improved and surgery cancellations reduced. Efficiency can be improved with dedicated theatre sessions co-ordinated with clinics.

For dental services, the driver was to future proof the service and introduce digital technology. This reduces patient doses, enables images to be stored within the electronic patient record so they are available at all clinics and saves staff time.

Locala podiatry staff needed to be trained and to demonstrate competence in the use of x-ray equipment, the statutory requirements of their roles and the radiation protection measures required to ensure staff and patient safety. Dental staff required training in digital technology and associated quality control tests.

We had to research digital technology QA/QC recommendations and techniques and become proficient in use of image analysis software packages to enable the delivery of radiation protection services and advice.

We restructured staff and work tasks to be carried out by appropriate grades of staff and recruited a lower grade of technologist to work under the supervision of more experienced staff. We reviewed and revised job descriptions and introduced the necessary skills into job roles.

Specific training courses on digital x-ray were sourced from professional bodies. Other training was delivered by experienced members of staff.

As a result of this service, BRPS has introduced support for digital imaging to other clients.

Feedback from Locala and their recommendation of our services to others indicates that these changes brought about improvements.

We continue to compare QA & QC against baselines, conduct patient radiation dose surveys and conduct service review meetings, supported by client satisfaction surveys.
Long term ventilation patients who have been discharged into the community whilst still on a mechanical ventilator are supported by both technical and medical staff from CMFT. The patient is visited by staff to ensure the airway and ventilator management is maintained at the in-hospital standard. This includes ensuring that the ventilator, humidification and suction equipment is maintained to a safe level and patient settings are appropriate.

Under the new arrangements community staff are trained in the use of the equipment and regular maintenance checks and consumable changes are performed by the Critical Care Technology dept. A support line is setup to provide 24hour assistance for troubleshooting the equipment. The equipment used is different to that used in the hospital.

The change has enabled ventilated patients to move out of the hospital ICU into a more patient and relative friendly environment. This has improved patient experience and service management.

The ICU is not an ideal setting for a long term ventilation patient and the aim was to improve the patient environment, enabling easier visiting by friends and relatives, while maintaining quality of care. At the same time, bed management and productivity in the ICU could be improved.

Training in new equipment was needed. Staff are now able to work with autonomy outside the hospital environment.

The impact of the changes is being monitored by regular communication and documentation with the patient, their relatives, the community medical and nursing staff.

Links with community medicine were developed and we now deliver and improved experience for the patient and family.

The service is provided on a 7 day a week basis for a limited number of patients and we are in discussions with the North West paediatric home ventilation service to share our experiences.

Name of service: Community Ventilation Support
Area covered: Central Manchester
Organisation: Central Manchester NHS Foundation Trust
Contact: Dave Edwards, Lead Critical Care Scientist

About the Service

Why Change?

The Workforce

Challenges

Outcomes
Secondary care services have been developed to support the pathway, but have not specifically required a change in the workforce.

The gastroenterology service manages referrals and organises administration of IV iron. The pre-op assessment team will screen patients for anaemia and return them back to the GP for haemoglobin optimisation (as per pathway).

The ambulatory care unit is recently established and already has an “iron deficiency anaemia pathway”.

Each of these three new/recently established secondary care services is intended to support the primary care aspects of the pathway when they become necessary for the patient to be referred into them.

Bolton NHSFT is an integrated organisation (community and secondary care). The project has required joint working between CCG and secondary care colleagues and a high level of cooperation and respect for each other’s perspectives.

It was necessary to develop a full understanding the financial aspects of the project and the implication of quality premiums which was sometimes complex and challenging.

The pathway has been recently implemented (January 2016) and outcomes will be audited later in the year. These are likely to include:

- use of IV iron (appropriateness/cost)
- use of red cell transfusion in elective surgical patients and in patients referred for treatment of severe symptomatic anaemia
- length of stay in elective surgical patients
- patients referred for surgery who have optimised/sub-optimised haemoglobin levels
- post-op outcomes/complications
- numbers of referrals for IV iron (via gastroenterology)
- number of referrals for IV iron/transfusion in the ambulatory care unit care unit
ABOUT THE SERVICE

We hold 3 outreach repair clinics a month - one in each of 3 locations. This is so that patients can be seen closer to home for simple repairs, new moulds fitting, second aids fitting and impressions for new ear moulds. We also give advice and can examine people’s ears for wax/infection. Staff use a laptop so that digital hearing aids can be adjusted outside of the hospital.

WHY CHANGE?

Patients asked for the change in a survey that we undertook. This combined with a general drive to have services provided closer to patients’ homes or with easier access in a town centre location.

THE WORKFORCE

Some training was needed so that volunteers could carry out simple repairs and some additional IT skills were needed to set up and synchronise the laptop. We trained band 4 staff to run clinics and to manage volunteers. We also appointed an apprentice to assist in clinics after Level 3 Clinical Healthcare Support training.

THE CHALLENGES

Finding rooms to use free of charge was a challenge. One clinic is held in a community centre, one in a GP practice and one in a Council owned building.

THE OUTCOMES

We monitor the number of patients who use the service at each session and the numbers grow every month. The Town Centre clinic is particularly well attended. We have had positive feedback from patients, their carers and GPs and have increased productivity which we hadn’t expected.

Name of service: Audiology Outreach
Area covered: Penistone, Goldthorpe and Barnsley Town Centre
Organisation: Barnsley Hospital NHS F Trust
Contact: Liza Smeeton, Head of Department

Healthcare Science Specialism: Audiology
The service provides ambulatory ECG services within the setting of a GP practice. UHSM staff support the practice to deliver a high quality ambulatory monitoring service, with the ability to transfer reports for analysis back to the hospital. Any patients showing significant rhythm disturbances which require cardiology review or opinion can offered outpatient appointments at UHSM without the need to repeat diagnostic testing. The clinical governance of the staff providing the service is undertaken by UHSM.

Existing technology was utilised, with further investment to assist transfer of patient reports between sites and in more recorders to expand the services into the community as the service expands.

**WHY CHANGE?**

By redesigning the patient pathway we were able to provide a service closer to the patient’s home and ensure high quality arrhythmia analysis for patients being monitored in the community. Local GP surgeries had a positive approach, wanting to improve the standard and quality of primary care diagnostics.

The service aims to improve patient experience, the quality of care, service efficiency and productivity.

In addition, we have improved access to expert opinion, with patients being able to see the right people in the right place at the right time. It has delivered higher quality and reduced referral times for those who need it. The GP receives vital information around the identification of the pathology, with a clear outline of how this will be managed. This reduces delay involved in traditional referrals and expedites treatment for a patient’s condition.

**THE WORKFORCE**

The diagnostic workforce helped design this service and to drive the standard of care. They needed reassurance that their skills could be delivered outside of a hospital setting and within the department we discussed, designed and continue to review the service delivery.

Staff take responsibility for the reports they generate and feel empowered by being involved in clinical decision making. Staff pride is enhanced and they follow through with any significant rhythm disturbances they discover.

The team provided training to Healthcare Assistants in the community setting, to ensure that the quality of the recordings was of a high standard and that the patients were receiving the appropriate information and preparation.

**THE CHALLENGES**

After initial concerns about the sustainability of the service, there is now strong managerial and clinical support for expansion based on the clinical model adopted.

Staff on site at the GP practice were initially cautious about a service delivered by hospital staff but are now highly supportive.

**THE OUTCOMES**

Measures used to track the impact include patient/users satisfaction, GP service users satisfaction, staff satisfaction and clinical outcomes.

The outcomes have been reduced waiting time for diagnostic testing, and a reduction in repeat diagnostic testing if patients require referral to tertiary care/specialist advice.
ABOUT THE SERVICE

Technician led carpal tunnel/simple ulnar nerve conduction studies are carried out weekly (Monday all day) in Bolton One Community Leisure Centre for patients seen by the MSK service. Tests are performed by an experienced Band 7 Clinical Physiologist who will give a provisional report to the clinicians on the day. Results are brought back to SRFT to be officially reported on by the Consultant Neurophysiologist, typed up and sent out within the week. Any patients who require further testing due to complex results indicating more than a CTS/Ulnar problem are given a further appointment with a Consultant Neurophysiologist at SRFT.

WHY CHANGE?

This initiative is an integral part of the plans to improve access to diagnostics within an 18 week pathway. By screening patients earlier, the end to end pathway can be improved.

Patient experience, efficiency of service, productivity and improved access can all be improved. Patients do not have to travel as far and have tests in a more timely manner. This initiative also addressed the issue of limited accommodation and equipment at SRFT.

THE WORKFORCE

Implementing this service required Band 7 clinical physiologists who could work independently. Training facilitated the reporting of CTs results independently and built confidence in performing more complex investigations.

THE OUTCOMES

Feedback from clinicians using the service has been positive. A reduced number of Bolton patients now travel to SRFT, and the clinics offered at Bolton One are used to full capacity. Patients also have shorter waits for NCS appointments. Overall, this has improved the efficiency of diagnostic tests in the Bolton area.
The WIRRAL OPAT service, hosted by Wirral University Hospital, supports the administration of IV antibiotics to patients in the community setting.

The multidisciplinary team
- facilitates referrals from both primary and secondary care
- provides advice for patient treatment plans
- provides a specialist IV access service including line insertions (PICC and midlines) and troubleshooting assistance for community nursing teams
- makes weekly patient ‘virtual’ ward rounds and patient review
- takes responsibility for governance
- works in partnership with the Wirral Community Trust and the Wirral Clinical Commissioning Group in service delivery.

All patients accepted into the service receive OPAT in the community in line with BSAC best practice recommendations.

**WHY CHANGE?**

Vision 2018 is the plan to re-shape health services and social care in Wirral, empowering people to take more responsibility for looking after their own health and improving patient choice. It also aims to reduce inpatient bed days and facilitate early discharge and admission avoidance.

This brings an increased need for specialist microbiology input into patient treatment plans to create a smooth transition from secondary to primary care (and vice versa) and to deliver a safe and standardised practice to patients receiving IV antibiotics in a community setting.
Other service users had to be reassured that the lab would still meet its existing commitments. Both staff and GPs required evidence of the need for change and the benefits. Examples and mentoring from existing similar services elsewhere in the country would have helped this process.

Quite considerable changes were required for a comparatively small team. These involved modifying working hours to provide a Saturday am service and increasing flexibility of work locations to enable the service to be provided closer to patients’ homes.

THE OUTCOMES

Measures of the impact include waiting lists, quality surveillance of test results, supervision of staff competencies, GP and patient feedback.

Reliable and accessible spirometry is now provided which results in an increase in the accuracy of test results and an improvement in treatment outcomes.

Overall, the service offers improved patient care, increased diagnostic test accuracy, and improved patient satisfaction.
The Bolton Community IV Therapy service provides IV therapies (antibiotics, blood and other IV medications) in the patient's own home, seven days a week. This has the benefit of avoiding inpatient admissions and protecting inpatient bed capacity, offers a better experience for the patient in terms of comfort and convenience and avoids the hospital environment for immunocompromised patients who may be at risk of healthcare acquired infection. We are now conducting research into the benefits of accelerated red cell transfusion for medically selected patients.

Why Change?

There is a very high demand for the BCIVT service, with demand outstripping capacity. The aim is to improve patient experience and to expand the service capacity so more patients can benefit.

The accelerated red cell transfusion research is intended to provide evidence for the safety of 60 min per unit transfusions (instead of 90 min per unit), the positive impact on the BCIVT service capacity, and improved patient and practitioner experience.

Why Change?

The service and proposed changes are well supported by all involved. All staff involved are clear about the benefits of accelerated transfusion and have enthusiastically supported the research.

The Workforce

No new clinical skills are required to deliver accelerated red cell transfusions and the change can be achieved with the existing personnel and skills, although some training in the research protocol was needed.

The Outcomes

The research was selected for an oral presentation at the International Society of Blood Transfusion Congress in London (June, 2015) and received extremely positive feedback and a large amount of interest from colleagues around the world. A number of UK and overseas organisations have asked for details of both the home transfusion service and the accelerated transfusion protocol with the intention of providing similar services in their own organisations.

Safety is measured by monitoring adverse events - none have so far been identified or expected.

Impact on capacity is measured by:

- the number of accelerated transfusions delivered - both in total and per patient.
- the number of patients who are eligible for accelerated transfusion
- treatment delivery time released compared to standard rate transfusions.

Patient and practitioner semi-structured interviews (thematic analysis) offer feedback on the patient experience.

The research has not yet been fully reported (data collection will not be complete until the end of 2016), but preliminary data suggest that accelerated red cell transfusions for medically selected patients is safe, has a positive impact on overall service capacity of the BCIVT service, and patients and practitioners are reporting positive experiences.
UHSM staff deliver a high quality pacing service in a community hospital setting, with the ability to transfer any reports to a central database. This offers patients a local service, reducing travel for routine pacemaker checks. Clinical governance of the staff is undertaken by UHSM and all staff work on a rotational basis in the community and within the hospital setting.

The staff needed reassurance that their skills could be delivered outside of a hospital setting and within the department we discussed, designed and continue to review the service delivery. The service designed mirrors the environment and standards of the pacing service within the tertiary unit in a community setting.

The service needed a commitment to travel to a new place of work and adjustment to an independent working environment. Their resulting increased confidence has reduced the need for reassurance over every case and had a positive impact on their knowledge. The staff now all drive the standard of care, taking responsibility for the patients they see.

By redesigning the patient pathway we were able to provide a service closer to the patient’s home using high quality assured operators. The local CCG was keen to maintain the standard and quality of primary care diagnostics. The main aim was to improve the patient experience, as well as local access to diagnostic testing. This has been achieved with patients being able to see the right people in the right place at the right time.

This has resulted in increased capacity in the tertiary clinics and allowed the patients that need a tertiary service to receive it with less waiting time. Staff have also benefitted - typical quotes are “It’s nice to work in a place where I can focus on the patient without other distractions” and “It’s great spending time with the patients and it reminds me of why I love my job”.

After initial concerns about the sustainability of the service, there is now strong managerial and clinical support for expansion based on the clinical model adopted. Staff on site at the community hospital were initially cautious about a service delivered by hospital staff but are now highly supportive.

Name of service: Cardiac Diagnostics Pacing Service
Area covered: Greater Manchester
Organisation: University Hospital of South Manchester NHS Foundation Trust
Contact: Andrea Arnold, Regional Cardiac Physiologist Tutor
The Barnsley Assistive Technology team has now been commissioned by NHS England to cover the Yorkshire and Humber region having previously covered just a part of South Yorkshire. Our team aims to improve the independence of people with disabilities through provision of electronic assistive technologies. We provide specialised services for augmentative communication aids and environmental controls – Stephen Hawking is a high profile example of someone using these technologies but we work with a wide variety of different individuals.

Why Change?
Change was needed due to inequity in service provision nationally, and in our region. We were involved in research to identify this. There was also significant campaigning by voluntary sector organisations and government sponsored projects to investigate improving provision.

Impetus for the change came from the creation of NHS England (with a clear remit of specialised service commissioning) and a review of the service specifications by their Complex Disability Equipment Clinical Reference Group. This led to an identified need to improve service provision nationally, the identification of potential providers and a bidding process to secure additional funding.

About the Service
The Barnsley Assistive Technology team has now been commissioned by NHS England to cover the Yorkshire and Humber region having previously covered just a part of South Yorkshire. Our team aims to improve the independence of people with disabilities through provision of electronic assistive technologies. We provide specialised services for augmentative communication aids and environmental controls – Stephen Hawking is a high profile example of someone using these technologies but we work with a wide variety of different individuals.

The Workforce
Our multi disciplinary team will be expanding from around 5 WTE to around 25 during our two year plan. This involves the addition of a range of Allied Health Professionals including clinical scientists and technologists. We are developing a significant workforce where few specialised skills previously existed or were widely dispersed. Training this enhanced team is challenging as it is a niche specialism.

The Challenges
The development of this service involved a total change of service structure, which has however been well supported by the trust and NHS England. There are workforce issues, particularly with clinical scientists and technologists. To date there have been very few roles in this specialism and thus there is a lack of specialist staff. It will take some years for this position to change – as the most likely solution is to encourage more trainees into this position and to support some staff in achieving registration via the equivalence route.

The Outcomes
This process is happening nationally – though we are one of the regions with the largest amount of work to do, having come from a much more diverse picture in terms of existing service provision. We are approximately one year into our two year plan and are currently on target in our expansion. The ultimate outcome, we hope, is that those individuals with severe disabilities in the Yorkshire and Humber region will be provided with appropriate specialised communication aids and environmental controls and that we will continue to develop the national and international reputation of our service.

Healthcare Science Specialism: Rehab Engineering, Assistive Technology

Name of service: Barnsley Assistive Technology Team
Area covered: Expanding to cover Yorkshire and Humber by April 2017
Organisation: Barnsley Hospital
Contact: Simon Judge, Service Lead (Clinical Scientist)
The Nutristasis Unit was set up at St. Thomas’ Hospital to support the development and application of novel markers of vitamin status. The unit performs >300,000 tests each year and consists of 13 staff.

Increasingly we were being approached by members of the public frustrated that they did not have access to our tests. In many instances the individuals had made multiple visits to their GP, and had multiple laboratory tests ordered and performed, without a diagnosis being made. We set up a mechanism three years ago to make these tests directly available to the patients. Deficient vitamin states have subsequently been revealed using the laboratory tests we have available.

We continue to develop the service and have now approached a national network for phlebotomy services to further reduce the distance patients need to travel to provide the blood sample.

We continue to automate our assays making it easier to perform high numbers of analysis. It also makes it easier to share the methods with other organisations. We are currently designing a new generation analyser which will make method transfer easier.

Why Change?

Our principal aim was to improve access although the increase in activity has further improved productivity. We have also set up an accredited international quality assurance scheme to address gaps in EQA provision. We now have more than 40 members from 15 countries.

The reference tests we provide are either unique or only available from a limited number of laboratories. We also have the expertise in clinical interpretation and wanted to make this expertise widely available, direct to patients.

The Workforce

Direct interaction with patients required specific training in those skills.

The Challenges

The team is open to new ideas and ways of working and there were no particular challenges with delivery of project.

Signoff was required from the governance team – but they were fully supportive once the case was presented.

The Outcomes

We measure patient feedback to assess our service delivery. The wider availability of tests has also brought educational benefits with GPs becoming more aware of the next generation of tests. Collaboration is key. Scientists from several other hospitals have spent time with us to learn our methods and introduce them locally.

About the Service

Name of service: Nutristasis Direct
Area covered: National
Organisation: Guy’s and St. Thomas’ NHS Foundation Trust (Viapath)
Contact: Dr Dominic Harrington, Consultant Scientist / Scientific Director

Healthcare Science Specialism: Haematology
In 2004, as part of the new contract, GPs were required to register all patients with a diagnosis of COPD and conduct follow up testing. The commissioners asked us to develop a collaborative service, commencing in Central Liverpool. We now operate from more than 12 sites across the entire city of Liverpool. We are currently commissioned for up to 10,000 full spirometry tests and are in discussion with commissioners to extend it further.

We meet with commissioners and lead GPs regularly for a team approach. We are now working collaboratively with the CCG trying to capture the traditionally hard to reach groups of patients such as homeless or drug users and are also looking to “bespoke clinics” for specific groups, to meet GPs’ needs.

The service operates 5 days per week with flexible time slots for appointments with some clinics on Saturday to meet demand. In April 2015 we added diagnosis of asthma with an estimated 600 extra tests for patients 17 years upwards in a pilot scheme.

All tests are fully reported by a qualified physiologist and results sent to referring GPs.

We also have access to the opinion of a consultant chest physician for exceptionally difficult reports.

Principal drivers for change included:
- the demand from the new GP contract
- revised NICE guidelines for COPD and Asthma
- demand to take services out of the hospitals and into community venues
- a wish to establish a GOLD Standard diagnostic service with opportunities for all patients to receive a high standard of diagnostic spirometry in the best place at an appropriate time
- an intent to show innovative thinking and desire to work collaboratively

The staff were engaged to apply their expertise and to exercise their clinical judgement outside of the hospital environment. That required training, an appreciation of the big picture and an ability to build strong relationships. We added clerical hours, introduced the roles of Assistant and Associate Practitioners, added robust quality control, where a random report will be selected and reported again by another member of the team. Flexible working has been necessary due to clinic times, including the trialling of evening or Saturday clinics.

We can report higher levels of patient satisfaction, have achieved targets and generated income resulting in investment in equipment and staff.

GP leads have embraced the service, are now endorsing the standard and asking for information from our database which will indicate areas of high uptake, DNA rates and show practices not using the service but doing their own spirometry.

An added bonus has been the relationships developed with our community colleagues including the practice nurses, the neighbourhood practice managers, the GPs and the commissioners.

We also exercise greater control over referral rates, clinic numbers, clinic times and location of clinics.