



YORKSHIRE & HUMBER  
ACADEMIC HEALTH SCIENCE NETWORK





# **Diagnostics Symposium 2015**

## **Driving the Healthcare Revolution**

## Foreword from Professor Sue Hill, Chief Scientific Officer, NHS England






“The Diagnostic Symposium 2015 was extremely well-timed as we approach the start of a new era in the delivery of diagnostic services. Diagnostics are the signaling system at the heart of the NHS - directing patients on their journey and vital along the patient pathway in ensuring timely and effective treatment. More importantly, as genomic knowledge and drawing together patient information becomes more significant as precision medicine becomes a reality we will be looking to increasingly sophisticated diagnostics to ensure that patients get the most appropriate intervention for them as an individual.

Around 1 billion diagnostic tests are undertaken across the NHS in England each year taking up approximately 10% of NHS spend, with demand increasing year on year. These services are vital:

-  For early identification, screening and assessment of symptoms, in diagnosing disease and determining severity and functional impact as well as in measuring and monitoring response to therapeutic intervention by both pharmacological and non-pharmacological agents;
-  To underpin all models of care, irrespective of setting, and are the first step in most patient pathways and therefore vital in reducing premature mortality
-  In over 80% of all clinical decision making; and
-  For the successful and sustainable delivery of A&E targets, Referral to Treatment (RTT) waiting times for both elective and outpatient care, reduction in hospital admissions and in length of stay and patient experience.

There are considerable cross-cutting issues across diagnostic services. We still see significant geographical variation in diagnostic tests and investigations, with marked inequality of access. This needs to be addressed if we are to meet both current and future demand for these services and achieve quality outcomes for patients.

Diagnostics play a central role in the future strategic direction for the NHS as set out in the Five Year Forward View:

-  In improving integration of services – breaking down barriers between services and developing new integrated structures
-  As part of the new structures for delivering care to integrate services – with more care closer to patients and developing specialist centres to tackle comorbidity
-  Improving the NHS’s ability to undertake research and innovation and raising the game on health technology
-  In giving patients far greater understanding and control of their own care
-  Supporting a radical upgrade in prevention and public health

Delivering this sustainable future will require a step change in thinking, harnessing the latest in new technologies and approaches while drawing on the talent and wisdom of everyone within the NHS. We will need to make the most of Big Science, advances in bio-nanotechnology and Big Data.

In March 2015, the NHS England Board authorised a project to understand the implications of these emerging technologies on the NHS. As part of this exercise, the Diagnostics Symposium offered the opportunity to draw upon the knowledge and experience of a range of stakeholders to start a dialogue to inform the future provision of diagnostic services across the NHS.

This symposium was structured to inform and challenge thinking in order to start to shape and create state-of-the-art diagnostic services and an infrastructure to deliver the NHS of the future. Going forward, we will need visionary scientific leadership, innovative providers and effective commissioning.

As Chief Scientific Officer, I am collaborating with Strategic Clinical Networks to improve scientific advice and leadership on the ground, so that we are able to drive improvements in quality and capture opportunities for transformational change in diagnostics across a wide geography.

The views of commissioners, providers, clinicians, healthcare scientists, academics, industry and system representatives, are vital in helping us to understand how we could achieve this ambition, securing the successful transformation of diagnostics services”.



Professor Sue Hill  
Chief Scientific Officer  
NHS England



## Foreword from our sponsor – BIVDA

“On behalf of the British In Vitro Diagnostics Association (BIVDA), I would like to say how pleased and delighted we were to support the Diagnostic Symposium 2015 organised and hosted by the Yorkshire & Humber AHSN on behalf of the four northern AHSNs (including Greater Manchester, North East and North West Coast). This was a significant event for the sector and a great opportunity to bring a wide range of stakeholders together. We also welcomed engagement from NHS England.



In Vitro Diagnostics (IVDs) are a critical part of the overall diagnostics sector for the NHS. But IVDs don't just enable a diagnosis or ruling out of a condition; they are increasingly important in selection of drug therapies and monitoring response to treatment as well as managing disease and screening for potential health problems.

The role of IVDs in improving outcomes and cost efficiency increasingly has been recognised by the NHS and Government over the last decade or so. This has led to the landscape for development of new tests and technology in the UK being fostered accordingly with the creation of the NICE Diagnostics Assessment and associated programmes, the creation of the NIHR Diagnostic Evidence Co-operatives and the Precision Medicine Catapult. These will be supported for early stage development by the planned MRC/ EPSRC Pathology Nodes which will give the ability to have a seamless pathway for diagnostic innovations to follow.



We also welcomed the creation of the Academic Health Science Networks (AHSNs) as a means to foster local innovation and assist diffusion and uptake of tests and technology into the NHS in England. Inevitably challenges remain. We are waiting for a new Regulation for our sector to be finalised in Europe. This is leading to a period of uncertainty for companies around future compliance requirements and will mean additional cost to manufacturers which will need to be built into the business models. It may lead to some products being discontinued from product portfolios.

The financial flows in the NHS also provide challenges. Appropriate Point of Care Testing can lead to improved care but require changes to the current system so the value can be captured; shared risk projects may be one route companies can take to allow further use of point of care tests in the community. Within secondary care, some diagnostic tests may need to be funded by the specialties benefitting from the information they provide rather than expecting the Pathology budget to cover all testing. BIVDA is hopeful that the Diagnostics strategy being developed by NHS England will help to unblock funding flows.



We also would love to see healthcare scientists seizing opportunities to branch out into the community to support diagnostic testing outside of the laboratory and secondary care and believe this could provide an exciting career path in the future. The use of digital and telehealth technologies will also enable greater independence for patients living with long term conditions to manage their condition and minimise clinical input.

A BIVDA member is currently working to produce a test to predict flares of Inflammatory Bowel Disease for people living with this debilitating condition.

This will reduce hospital admissions and allow medication to be adjusted to reduce the impact on the patient and is just one example of how diagnostics will be able to transform care in clinical pathways.

BIVDA is really optimistic about the future for its industry sector and the massive opportunities we have and will have to show how diagnostics make a difference.”

*Doris-Ann Williams*

Doris-Ann Williams MBE  
Chief Executive,  
British In Vitro Diagnostics Association (BIVDA)






## The Diagnostic Symposium 2015 – “Driving the Healthcare Revolution”,

hosted in Leeds on 7th July 2015 created an opportunity for an audience of over 200 delegates comprising senior NHS system policy makers, leading clinicians, NHS local leaders, UK trade associations, and industry colleagues to discuss both the strategic and delivery aspects of maximising diagnostic benefits on behalf of patients and to contribute to the emerging national diagnostics strategy.

The event was delivered in collaboration between the four northern Academic Health Science Networks (AHSNs) (Greater Manchester, North East & Cumbria, North West Coast and Yorkshire & Humber), supported by the headline sponsor (BIVDA – British In Vitro Diagnostics Association) and NHS England, and hosted by Professor Erika Denton, National Clinical Director for Diagnostics NHS England.

The event programme comprised a morning session intended to stimulate discussion and debate amongst delegates later in the day and included:

-  A keynote address from Prof Sue Hill, Chief Scientific Officer NHS England regarding the ‘Strategic Opportunities offered by Diagnostics Innovation’ which explored the paradigm shift in diagnostics thinking, the progress made in the 100,000 Genomes project, and considered the implications for new models of care (Five Year Forward View).
-  Doris-Ann Williams, Chief Executive BIVDA, provided insight into the landscape and development of IVD industry and issues to be explored including clinical utility; redesign (and potential disruption) of working practice and care pathways; health economics; and flow of funding for provider care in hospital and community settings.
-  Presentations from Dr Avril McCarthy, Medical Technologies Lead, NIHR Devices for Dignity HTC and David Coyle, Renal Patient Lead, NIHR Devices for Dignity HTC which explored the route to adoption of new diagnostics technologies and the role of the ‘expert patient’ and profiled a selection of case study projects currently under assessment for implementation.

## Accelerated Learning Sessions

The event programme included accelerated learning sessions structured to inform and challenge delegates’ thinking and all participants had the opportunity to attend and contribute to four of the following thematic sessions:

- 1.** Personalised Medicine - facilitated by Gill Hamblin (Programme Manager, NWC AHSN)
- 2.** Diagnostics Service Quality – facilitated by Cathy Gritzner (COO, GM AHSN)
- 3.** Data & Data Linkage – facilitated by Patrick Trotter (Innovation Manager, Medilink Y&H)
- 4.** Science & Innovation in Diagnostics – facilitated by Mike Messenger (Deputy Director, NIHR DEC Leeds)

5. Delivering differently to achieve the Five Year Forward View – facilitated by Ailsa Anderson (Programme Manager, NHS Innovations North)
6. Genomics & Genetics – facilitated by Angela Douglas (Programme Director, NWC NHS Genomic Medicine Centre)

And consider the following questions in turn:

- What are the opportunities?
- What are the barriers?
- What are the commissioning considerations?
- What does excellence look like?

The outputs from these accelerated learning sessions have been reviewed and the key discussion topics are summarised in the following sections.



# 1. Personalised Medicine

Populations are diverse and not all treatments and interventions will work for all patients. Personalised (or stratified or precision) medicine enables us to better understand individuals and identify what works for them, targeting treatments specifically to those patient subpopulations that are more likely to respond to a particular treatment.

While the future aim may be the ability to have complete personalisation, with interventions unique to a patient, it is the ability to classify individuals into subpopulations that differ in their susceptibility to a particular disease or their response to a specific treatment. Preventative or therapeutic interventions can then be concentrated on those who will benefit, sparing expense and side effects for those who will not.

Personalised medicine is therefore key in delivering the four P's of personalised care – **predicting** and **preventing** disease through more **precise** diagnosis which results in more **personalised** treatment and care and a more participatory role for patients.

Personalised medicine also enables increased efficiency of treatment through coupling of therapy with companion diagnostics (theranostics), for example, Herceptin - if a woman's breast cancer is HER2 positive, Herceptin will be effective for her but not for someone whose cancer is not HER2+. So the HER2 test was prepared and launched on the same day as Herceptin.

## Accelerated Learning Session Outputs:

### Key topics:

- 🟡 Patient engagement
- 🟢 Management of expectations
- 🟡 'Joined up' strategies
- 🟡 Definitions and terminology used
- 🟢 Workforce training
- 🟡 Standardisation
- 🟡 Existing evidence base



The primary opportunities identified by participants were in relation to patient benefits – including potential for better outcomes (e.g. less side effects), 'right patient, right drug, right time', improved compliance and enabling self-management. Patient benefits were also viewed from the perspective of their relationship with their healthcare provider in terms of changing culture to create new discourses with patients for person-centred care, breaking down barriers in communication and managing expectations in regards to care pathways. Clinical opportunities included expectations of a reduction in litigation; costs savings; combinatorial innovation advances to introduce new devices to complement new, more effective drugs; potential for less 'waste'; and generation



of patient subpopulation evidence bases. Notably, the focus was on preventative interventions and joined-up working.

A number of barriers were identified – many of which were replicated across the parallel learning sessions - including the inflexibility of finances and current systems; lack of current workforce training and organisational change management capabilities; cultural expectations through media profile; competitive commissioning; lack of standardisation and quality assurance; and time constraints i.e. ‘how can get to where we need to be quickly?’. The limitations of the existing evidence base (data was described as poor) and IT integration were highlighted alongside the need to understand the language employed in future healthcare systems i.e. making the terminology accessible to all involved - especially those less technology savvy – to prevent stakeholder exclusion from healthcare decision making.

Commissioning considerations centred around the definition of personalised / stratified medicine, procurement, and the existing evidence base (which had been identified as a barrier to implementation). It was recognised that there was a need to create a joined up strategy, linked to clinical outcomes, with sufficient capacity, to enable equity of access and an understanding of unmet need within existing systems. Participants recommended that commissioners increase engagement with stakeholders / clinicians and patients, review the impact of decommissioning and consider two key questions ‘Who pays for what?’ and ‘What outcomes are being measured?’

In response to ‘What does excellence look like?’, consultation feedback focused on stakeholder collaboration (partnership, integrated care, increased communication); standardisation; and scale up of good practice and understanding of unmet need to facilitate a healthier population of empowered patients providing fully informed consent. However, the route to excellence would require development of a robust evidence base.



## 2. Diagnostic Service Quality

While commissioners have a general duty of care to ensure all NHS commissioned services safe and of agreed quality, the delivery of this for scientific and diagnostic services is limited and variable. Even within specialist commissioning specifications there is often not a clear focus on the scientific and diagnostic services. Lack of robust quality assurance has seen poor outcomes for a number of patients.

Accreditation to defined standards, aligned with, for example, the International Standards Organisation, and through externally managed process undertaken by an external body with expertise (e.g. UK Accreditation Service) is seen as a key mechanism to drive quality improvement and the provision of safe, effective, innovative patient-centred scientific and diagnostic services. The structured and ongoing process of analysis, challenge, assessment and action that lies at the heart of accreditation schemes acts as a driver for continual service improvement. Independent assessment provides an objective view of what is being delivered and the standards, approach and protocols of the accreditation process itself do an enormous amount to embed a quality culture within each individual service.

These factors have led NHS England to make the accreditation of scientific and diagnostic services one of its current business plan priorities. In addition, the extended quality role of accreditation schemes has been recognised by the Care Quality Commission as a cornerstone of its inspection regime.

### Accelerated Learning Session Outputs:

#### Key Topics:

- 🟡 **Workforce training**
- 🟢 **Standardisation**
- 🟠 **Restructuring service & finance flows**
- 🟡 **24/7 service**
- 🟢 **Champions**



The opportunities emerging from focusing on the accreditation of diagnostic services were to enable joined up working and collaboration across patient care pathways to create an infrastructure which recognized self-monitoring and personalised healthcare as an integral component. The participants agreed that standardisation of services to ISO quality standards should be recognised as a priority within the NHS England business plan. Opportunities for future investment in i) new equipment and technologies (via PFI, leasing, novel models) ii) centralisation of laboratories for specialists services freeing up capacity in other laboratories for routine work and iii) workforce training with specialist workforce for specialist services.

The key barriers identified during the learning sessions were costs, where financial flows and Payment By Results (PBR) did not help improve models of care and pathways; the

risk of cutting services and outsourcing to other providers; loss of trained staff to other providers who might provide more flexible terms and conditions; and loss of standards e.g. will other providers adhere to the ISO standards? Participants commented on the ISO process being very paper driven *“It doesn’t measure quality and takes ages to complete.”* At present, it was felt that diagnostic staff feel excluded from the contracting processes even though they are a crucial part of the pathway of care *“They are very often left to pick up the pieces.”*

Fundamental commissioning considerations were identified as the lack of understanding by commissioners regarding diagnostics in pathways, the need for **visible** champions who can work with commissioners; and the transition to outcome based commissioning models. Better value for money is driving competition in new diagnostic technologies and the opportunities for commissioners to be involved in the development of new product innovations (as well as service and system innovations e.g. GP federations; Chambers model) will be integral to success. Participants also queried how commissioners will commission to universal standards with outsourcing raised as a key discussion point.

Excellence was seen as patient centred, 24/7 services that can be accessed quickly due to fully integrated medical IT systems across all areas where diagnostic systems capture data and ‘talk to each other’ to enable efficient and high quality interpretation of results as an integrated service rather than the patient as a ‘number’. Digital pathology services could lower costs and increase access and drive quality and the implementation of input and output audits and risk reduction models have the potential to help CCGs to commission more appropriately for their area/population.

### 3. Data and Data Linkage

Building a fuller picture of a patient through combining a range of diagnostics can deliver significant benefits to outcomes and timeliness of treatment. To deliver the potential of combined diagnostics requires good data management and data linkage will be crucial. The new era of precision & personalised medicine will require data to be combined, analysed and correlated to enable decisions about precision targeting to be made. We can capitalise on the technological revolution happening in industry and wider society, recognising its application to the healthcare setting.

While the NHS is a world-leader in primary care computing and some aspects of our national health infrastructure, progress on hospital systems has been slow. While current patient testing produces a wealth of data, this is frequently not captured and correlated as well as it could be. A different approach is now being taken with the National Information Board focus on the key systems that provide the ‘electronic glue’ to enable different parts of the health service to work together. Other future systems will be for the local NHS to decide upon and procure, provided they meet nationally specified interoperability and data standards.

Looking ahead ‘Big Data’ techniques will be crucial to the future of diagnostics, supporting the creation of new markets between the NHS, technology companies and patients, and unlocking the potential of data, technology and digital to create products for smarter, faster and better healthcare and grow the digital health sector - an emerging area of UK innovation. This will lead not only to savings and efficiencies in healthcare provision, but improve the overall quality of healthcare.

## Accelerated Learning Session Outputs:

### Key Topics:

- ◆ Definitions and nomenclature
- ◆ Culture change
- ◆ Interpretation of data
- ◆ Workforce training
- ◆ Interoperability
- ◆ Security and governance



When considering the impact of big data and data linkage, it was recognised that the opportunities and barriers were often the same. The headline opportunities were seen to be the ability to collect and connect data across all clinical areas to achieve meaningful cross-functional and cross-geographical statistics – benefits being the exposure of inequalities in care; patient view of their own care record and thus self-empowerment through knowledge; the ongoing collection of patient history in one repository; combination and use of different data sets to create the full longitudinal picture; and accessibility and care pathways improved for patients with multiple co-morbidities under the care of different providers. Big data is seen to enable standardisation of nomenclature (also a barrier due to resource capacity); future-proofing; less wastage; cloud based transfer of data; and analysis of the efficacy of drugs (usage and outcomes). Most importantly, widespread adoption of big data usage would create the opportunity for wider societal culture change. Looking ahead – ‘*when big data techniques are the norm, what next?*’ the answer could be analytics i.e. new questions and new hypotheses to identify new diagnostic opportunities..

Barriers were broadly identified in 5 key areas – commissioning experience; data security concerns; terminology; workforce; and failures in interoperability. Participants perceived the lack of experience in the CCG model to be an issue alongside the future impact on the referral system – the Health & Social Care Act front and centre in this discussion. Opinions about patient consents for opt-in on data sharing and the use of anonymised data sets indicated that much work will need to be done to achieve a common level of understanding and questions were raised about who can and will make these decisions and the funding and resources to support these decisions. As with the Personalised Medicine learning session, participants felt that there were assumptions about the definition of big data and the terminology / language applied to enable stakeholder understanding of the benefits and opportunities. The ask being to reduce overcomplicated structures and consider simple user interfaces. The speed of training of the existing and future healthcare workforce will have to keep pace with the speed of technology evolution and workforce personality and culture will require recognition in ongoing CPD and recruitment strategies as multi-disciplinary skill sets will be required to undertake complex analytics.

Commissioning consideration conversations resulted in more questions than answers – namely who owns and is responsible for protection of the data? Where will data be





stored? How do we back-up the data? How do we transfer data? Session participants could foresee tension at local level between short and long term benefits for commissioners when considering budgets (“*What’s in it for me?*”) and between local and national roles for interpretation and management of multiple commissioning decisions where specialist care was involved. Statistical outputs of big data infrastructure would have positive outcomes by acknowledging person needs rather than patient needs, with new questions and hypotheses requiring new studies and innovations and the ability to integrate between primary, secondary and social care, however, overreliance on statistics would be a threat to healthcare outcomes – how users interpret data will require detailed scrutiny.

The vision for what excellence would look like was for “*an integrated pathway that the **patient** thinks is excellent!*” Secure, interoperable, accessible systems that provide patient choice, clarity of ownership and governance, and, crucially, positive use and purpose (e.g. impact on population health). In response to barriers considered earlier in the discussion sessions, the future workforce will need to be skilled and full conversant with big data applications; system designs will require optimum search functionality for data extraction and versatile user interfaces; and quality standards implemented which evolve as part of a learning system of innovation.

## 4. Science and Innovation in Diagnostics – working together in partnership

Diagnostics operate at the cutting edge of science. Accessibility, uptake and promotion of scientific advances and innovation in diagnostics will be crucial to meeting the challenges of improving patient outcomes and in delivering future approaches such as precision and personalised medicine. There are a number of areas where we anticipate to see the impact of innovation.

‘**Big science**’ is those high-capital initiatives that require such investment they can only be delivered at a very limited number of sites. This includes:

-  **robotic platforms**
-  **multimodality imaging**
-  **highly specialised physiological investigations and models**
-  **remote monitoring and telereporting etc.**

This enables services to be delivered centrally at scale delivering efficiencies.

An example is Proton beam therapy, a type of radiotherapy that limits damage to tissues around tumours, requires the creation of enormous specialist buildings, such that the NHS is developing just two centres – in London and Manchester.

At the other end of the scale, **Miniaturisation** will bring to devices carried by – or even within – patients or close to patient as part of patient centred localisation. Bio-nanotechnology will drive point of care and hand held testing devices measuring multiple pathological and physiological parameters. Miniaturisation enables near-patient testing, self-testing



and home monitoring. This will lead to a much more distributive model of provision including a greater range of diagnostics on the high street and within GP surgeries.

## Accelerated Learning Session Outputs:

### Key Topics:

- Patient choice & engagement
- Evidence generation
- New technology adoption
- Commissioning structures
- Communication strategies



Opportunities for working in partnership to promote advances in diagnostics had resonance across all accelerated learning session thematic areas – achieving better value and maximising the use of NHS resources for improved patient outcomes and experience (e.g. keeping people out of hospital, pathways which are patient centric and patient led, wearable technology for self / home monitoring, treating an ageing population, use of IT to communicate results to patients). Participants also identified opportunities in upskilling the workforce; transparency in information flow; identifying emerging pathways based on unmet need and validating pathways via an enhanced evidence base; and early diagnosis enabling involvement in genome programmes.

However, there were many identified barriers to new ways of working. Evidence, and reliability of evidence (e.g. robust analysis of big data sources), was raised as a key issue to be resolved, alongside culture and skills and change management, limited incentives to change existing ways of working, and the capacity of the existing workforce to manage new technology portfolios and implement change. Advances in ‘big science’ and miniaturisation will depend on more support for innovators with a defined link between academia and clinicians, simplification of the adoption environment, and a clear pathway into the NHS for new technologies – the ‘lit runway’. Cost and budget impacts can be blockers to innovation therefore a refocus on savings and benefits over the long term was perceived as imperative.

The commissioning landscape was viewed broadly as a barrier to adoption of new technologies with knowledge, experience and understanding of potential opportunities questioned due to inconsistency of evidence requirements and the methodology employed to measure value. It was felt amongst participants that NICE guidelines would be more effective if they were mandatory and that differences in national and regional priorities will impact on the ability to effect change at local level (the complex commissioning environment cited specifically as a barrier). As reiterated in other learning sessions, multi-year budgets and short term cost impact versus long term benefits are a key consideration for commissioners. Participants also queried “*Where is the patient voice? Is it being heard?*” and saw enhanced communication with patients and all healthcare providers along the care pathway as essential rather than optional.

Future service excellence will be defined by patient satisfaction (better outcomes and

experiences); value for money (effective use of resources); validated, reproducible, accurate and timely results; and actively managed and evolving care pathways – where best practice is routine practice and service improvement is part of everybody's role and success is shared. A robust communication strategy embedded into every adoption of innovation will enable patient trust in 'the system' and could increase participation in research for next generation technologies. Excellence in future care is seen a collaborative achievement and responsibility through integration and engagement with the medical research community and medical technologies industry.

## 5. Delivering Differently to achieve the Five Year Forward View - new models of care

The Five Year Forward View, published October 2014, sets out the future strategic direction for the NHS. A key focus is to improve the integration of services - breaking down barriers between services and developing new integrated structures to drive the necessary outcome in both quality, outcomes and efficiency.

The Five Year Forward View anticipates new structures for the delivery of care, which will have diagnostic services at their core. Future provision will include:

-  **Multispeciality Community Providers** – based on alliances of GPs delivering a range of diagnostic services with a different workforce skill mix, potentially offering greater value for money and a reduction in waiting times as more diagnostics and treatments are delivered nearer to patients.
-  **Primary and Acute Care Systems** – 'vertically integrating' hospital diagnostic services with primary care diagnostic services in a continuum linked by technology and
-  **Hubs of diagnostic excellence** - working with local delivery providers (spokes) in a network alongside local partners e.g. Academic Health Science Networks (AHSNs) to drive quality, efficiency, innovation and research to provide a population based infrastructure.

The design and delivery of these new models of care, and the diagnostic elements within them, will require fresh thinking - looking beyond existing organizational and service boundaries to develop new patient-focused approaches based around pathways of care.

### Accelerated Learning Session Outputs:

#### Key Topics:

-  **Silo working – information and funding flows**
-  **Definitions used**
-  **Digital health solutions**
-  **Role of GP Federations**

Participants in the learning sessions commented positively on the recommendations laid out in the Five Year Forward View (FYFV), recognising that this new strategic direction will facilitate better procurement and regulation at scale and improved use of data to identify and respond to variation in unmet need and the impact on patient care. New integrated structures for delivering care have the potential to create new community-centric and virtual infrastructure such as community diagnostic centres, pathology centres and one stop clinics, for improved point of care testing and bringing specialisms into primary care, supported by shared electronic patient records, joined up planning and outcome based commissioning pathways.

However, despite an awareness and commonality of purpose about strategic direction and creating future models of care, participants identified a number of significant institutional barriers to progress including the limited ability to transfer information across primary, secondary and tertiary care; culture and practice slowing down implementation of new ideas; silo working in Trusts and lack of standardised approach to new business case development; costs; and definitions of the new models of care as laid out in FYFV e.g. defining what a Multispeciality Community Provider is and what they are not.

Core commissioning considerations mirrored the key barriers – focusing on fragmented commissioning and procurement arrangements which operate in silo budgets and ‘perverse’ payment systems. Participants suggested that budgets are joined up in order to follow the patient and that healthcare systems are viewed holistically (including how generalist and specialist care is delivered).

Excellence in care would be recognized by systems that are patient centred and outcome focused, rather than treatment focused, with GP Federations empowered to support new methods of testing.

Participants in this learning session reviewed the barriers, opportunities, commissioning considerations and future excellence for two of the proposed future models of care – vertical integration of primary and acute care and Multispeciality Community Providers.

## **Primary & Acute Care – vertical integration**

Opportunities lie in widespread adoption of digital health solutions facilitated by joint budgets, centralized IT infrastructures, commonality of outcomes and incentives. GPs would also benefit from CPD to define future iterations of these new ways of working (shared learning outcomes).

Immediate barriers replicated the general discussion outputs i.e. disconnected payment and planning mechanisms, clinical variations, and workforce and culture. For the new ways of working to succeed stakeholders in population based commissioning will have to define and agree on the definition of vertical integration and associated funding flows integrating health and social care. Organisational structure and methods for sharing information and governance will require disruption – and lead to answering key questions such as ‘How will GPs be paid?’ and “What would excellence look like if we could harness a collaborative response to these fundamental obstacles to new ways of working?”

Participants suggested excellence would be defined as holistic patient management, rather than disease management, made possible by centralised data sources, specialised centres (healthcare, social care and public health / prevention) and a pathway approach not predicated by postcode.

## Multispeciality Community Providers

Key opportunities are i) community diagnostic centres to provide cost savings and system efficiencies, enable early diagnosis, improve accessibility, and reduce secondary care admissions ii) community pathology centres staffed by workforce from secondary centres iii) effective integration of i) and ii). However, there are specific areas requiring scrutiny and consideration before developing this infrastructure, for example the capacity and capability of GPs to respond to diagnostic roles and responsibilities; the ability to deliver specialist services on a massive scale; silo structures and budgets; and patients concerns about change and the need for patients to trust these new ways of working.

If Multispeciality Community Providers are what 'we' think will work and effect change for the better they will need rigorous definition of what they are and are not. Commissioners will need to consider financial blocks, tariffs, governance and culture. If these issues can be addressed then excellence in resultant care would be evidenced by 'sign up' across the care pathway (primary, secondary and social care) to create joint ownership, for patients to be able to say "*I'm* in control of my condition" and a patient centred culture shift in thinking.

## 6. Genomics and Genetics

The mechanisms that drive and develop disease and adverse health, transforming the evidence base for medical assessment and intervention.

The 100,000 Genomes Project aims to cement the UK's role as a world-leader in this area, sequencing 100,000 genomes by March 2018. The Project centres on the relationship between the genetic code and the expression of this within an individual in relation to the disease they have or other findings that may be important in terms of their health (current or future) of that of their families. Existing diagnostic techniques are crucial to the Project as they provide the phenotypic characterisation of an individual's health to compare with the genetic code.

The potential of genomics is huge, leading to more precise diagnostics for earlier diagnosis, new medical devices, faster clinical trials, new drugs and treatments and potentially, in time, new cures. It will drive new diagnostic discovery and more targeted drug development. It also has the potential to uncover and drive new approaches to the prevention of disease. Learning from the Project to date has demonstrated how complex and difficult the Project is, but also how beneficial it is for patients in terms of driving improvements in core diagnostic services.

### Accelerated Learning Session Outputs:

#### Key Topics:

📍 Personalisation

📍 Societal and cultural change



## Education

### Long term strategy

The dominant phrase used in this learning session was ‘targeted’ – with opportunities encompassing care tailored to the individual; clear, accurate and personalised diagnoses; potential for less epidemics due to developments in targeted treatment; less sequential testing; and effective treatment through knowledge of an individual’s responses to specific treatments. High quality and timely pathways, including pre-emptive care, are anticipated to make a positive difference to the patient experience. Genomics could segment and aid understanding of diseases and thus prevent the onset of illness and the development of diseases, leading to cost savings (treatment, reductions in sequential testing, better use of resources due to getting the right treatment the first time etc.) and clinical transformation through patient involvement in service delivery. If developments in pre-natal testing (amongst other forms of testing) are to become the norm, education and a deeper understanding of genome sequencing is required for all stakeholders – opinion was that we are only at the start of this conversation.

The complexity of the 100,000 Genomes Project is evident in the range of barriers explored by the participants of this learning session – e.g. cost of testing; capacity to implement and respond to findings and understanding of the impact on clinical service; challenges in regulating services; fear of the prognosis and wider family impact – if there are findings, who needs to know? Do they want to know?; societal issues (will genetic findings influence patient behaviour? Could insurance implications deter participants? Are we opening a ‘can of worms?’); and data protection. Educating the wider population about genomics and genetics would take us further on the journey to interpreting ethical implications and managing patient expectations.

Increased education also extends to commissioners in order to articulate the benefits (which may not be visible for 40+ years) and understand the pathways involved. Contributors to this learning session saw risk in early regulation stifling innovation and the risk of losing integration due to the splitting of pathology and genomics, and, when considering competition vs collaboration, raised the question of whether the separate Genomic Medicine Centres (GMCs) would be competing. However, over the duration of the sessions, participants saw benefits in developments in genomics as outweighing the risk (cost savings, knowledge transfer, positive impact on patient care and experience, fluid dialogue for commissioning) if a clear definition of quality assurance was established.

Excellence was characterised as ‘Right test, Right patient, Right time’ with the UK leading Europe in the development of genomic medicine via networks and partnerships working together through centralised and localised hubs to create a highly trained, knowledgeable workforce, robust regulation and accreditation standards, supported by optimum IT integration, to bring positive changes to the patient experience.





## Summary & Outcomes

A post-event survey was circulated to the diagnostics stakeholder community present at the Diagnostics Symposium to encourage feedback and reflection on the content and format of the event.

**“a very interesting and insightful event”** – NIHR DEC Newcastle

**“The event brought together a very broad but relevant mix of people and it was interesting to see and hear a range of different opinions around the future of diagnostics”** – industry representative.



Responses indicated that the audience welcomed the opportunity to learn more about emerging national policy from NHS England and to hear more from an ‘expert patient’ on how an innovative diagnostic care pathway enabled a step change in the quality and management of their care. Delegates were also keen to receive the learning outputs from the accelerated learning sessions (and share with NHS England as part of the ongoing national strategy consultations) – the summary sections outlined above reflecting the intensive sharing of opinions and experiences during these sessions.

Recurrent themes were evident across the accelerated learning sessions – notably the impact on adoption of new ways of working by the funding flows between commissioners and providers; and the acknowledged demand for education and training, to positively impact the capacity of the existing workforce to manage new technology portfolios and implement change, and to enable patient and public engagement and manage societal expectations. At the core of future education and communication strategies will be the need to agree on terminology and language used (e.g. ‘big data’) to encourage and maintain widespread understanding and address issues such as data security and protection and behavioural change.

Going forward, delegates have expressed an interest in building on the momentum, networks and conversations developed at the Diagnostics Symposium and participating in an event in 2016 focused on adoption of new diagnostic techniques and technologies and the role of industry. The potential for this event is to be explored by the four northern Academic Health Science Networks (AHSNs) (Greater Manchester, North East & Cumbria, North West Coast and Yorkshire & Humber) and their strategic partners.



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