Working with Industry

Delivering innovative research through effective partnerships
Welcome to the NIHR CLAHRC YH Industry Briefing

This briefing showcases not only our ways of working with industry partners but also how we are having an impact locally and nationally. The CLAHRC Vision is to understand health care and health service needs and how they can be addressed and transformed by digital technologies as we strive to achieve the three key aims of the NHS safety, quality and cost effective care (Delivering the benefits of Digital Health Care 2016) www.nuffieldtrust.org.uk/research/delivering-the-benefits-of-digital-health-care


This view of a need to invest in applied health services and public health research in the populations most affected by disease burden and social deprivation was voiced recently in a letter entitled ‘shaping the future of NIHR’ from Professor Chris Whitty and Dr Louise Wood, with a clear view to balance NIHR research and innovation resources across the country.

Both policy initiatives support the vision of our NIHR CLAHRC in Yorkshire and Humber where we have, for many years, sought to address health inequalities and the significant burden of chronic disease populations through the integration of new innovative digital technologies and in partnership with the medical technology sector. Our success and impact in this area is evidenced both by external evaluations, and also by ongoing feedback from the National Institute for Health Research (NIHR), which has commended us on our partnerships with patients, the public and industry. I am confident that our work with new and emerging technology, is helping us to address the chronic disease burden and social deprivation that is our Industrial Heritage legacy.

Professor Sue Mawson
Director, NIHR CLAHRC Yorkshire and Humber
Background

With the publication of:

- ‘Innovation, Heath and Wealth: Accelerating adoption and diffusion in the NHS’ Department of Health in Dec 2011
- Academic Health Science Networks (AHSNs) designation guidelines
- Government Green paper ‘Building Our Industry Strategy’ Jan 2017

and the development of the Northern Health Science Alliance www.thenhsa.co.uk, it has become even more apparent that the government’s wealth and growth agenda is clearly linked to closer partnerships between the NHS, academia and industry.

In Yorkshire and Humber our portfolio includes a range of high value, high trust industrial collaborators from global, national small and medium-sized enterprises (SMEs). Our focus has been to work with industrial partners that align with our research themes and our core objectives; hence we have focussed more on the medical device and technology sector, and on delivering the benefits of digital health care. Given that the Pharma sector is beginning to explore the role of medical devices within its portfolio of service offerings, we will keep a watching brief for potential future partners.

The medical technology market is estimated to be worth £150-170bn worldwide, with growth rates forecast at 10% a year over the next five years and a market size approaching £300bn by 2015. It is a sector that is growing rapidly in the UK, with more than 3,000 companies that generate around £15bn in turnover http://bit.ly/2m2skUW.

Yorkshire and Humber is perfectly positioned for growth - with NHS England based in this region, a strong base of medtech and technology enabled care firms and coterminous NIHR CLAHRC YH and the YH AHSN resources to spearhead the use of innovative products and services in the NHS. The NHS Five Year Forward View (5YFV) and National Information Board’s paper on Personalised Health and Care 2020 highlight that digital technology plays a key role in all three elements in the 5YFV: public health, quality of care and efficiency. It will help ensure best value for the tax payer. More importantly these policy documents also state digital technologies will be more tightly embedded in NHS policy, finance and regulation.

Our NIHR CLAHRC’s industry engagement enables the private sector to capitalise on the great medical and clinical expertise housed within the region’s universities and research centres. We also seek to ensure patients have access to the latest research through our citizen cohorts enabling better outcomes for patients and a more person centre design and development focus.

Our range of offers to industry includes supporting:

- the development of partnerships between industry and NHS/Local Authorities
- the implementation and evaluation of evidence based technologies for chronic disease management and end of life care
- access to health economics research and new models of care using existing technologies
- validation of technology need through stakeholder scoping
- the contextualising of existing technologies for different environments
- use of participatory design methodologies in partnership with industry
- applications for new funding streams for partnerships and Knowledge Transfer with industry

Each of these activities helps to ensure that the NHS and Local Authorities have access to technology solutions. Therefore enabling a transformation in the way they work to improve the quality, safety, productivity and cost effectiveness of care. For industry these initiatives help ensure that their products and services address real needs and that their solutions are fit for purpose and affordable.
Objectives

NHS England recognises that without the effective use of new technologies the NHS will fail to deliver on its commitments in years to come. With this in mind, NIHR CLAHRC YH has developed an Industry Strategy that focuses on the medtech and medical devices sector. We believe this is the area that has the most potential to change the nature of health care, promoting wealth, improving health and building on the extensive work in this sector over the past five years in YH and within our partner organisations.

By wealth, we mean the impact our collaboration can have working with industry to support the implementation of a cost effective health service through new models of care and the integration of digital capabilities into new care pathways. This is alongside the direct benefits of attracting research funding and industry into the region.

NIHR CLAHRC YH measures the success of its industry engagement on building a small number of very high value relationships. We work closely with a wide range of collaborators to identify and understand industry needs, match industry needs with academic research interests and capability, whilst managing our established partnerships to ensure mutually beneficial and successful outcomes.

This is not to say that we will not engage with a much broader range of industry representatives. We see the relationships with our stakeholders as being vital to our impact agenda, raising awareness of the full range of NIHR CLAHRC YH activities, our core mission and underlying principles. Engaging with industry and community is a dialogue. A key feature of our ambition is for NIHR CLAHRC YH to increasingly act as a ‘meeting place’ and facilitator for industry and other stakeholders with an interest in mutual interaction, but who would not readily come into contact with each other or with leading academic researchers.

We have close relationships with both the YH AHSN and the Devices for Dignity (D4D) Health Technologies Co-operative (HTC). Collaboration with the YH AHSN has included the development of an evaluation offer for the Vanguards and the sustainability and transformation plans (STPs), thereby supporting new government policies regionally. From an industry perspective the link between the YH AHSN and NIHR CLAHRC YH is through the Telehealth and Care Technology Theme. The collaboration with D4D, also hosted at Sheffield Teaching Hospitals NHS FT, allows us to work together on the innovation pathway directing industry partners accordingly.
CLAHRC Financial Model

CLAHRCs were the first NIHR initiative that followed the Canadian model of health academies (Lomas, J., 2007. The in-between world of knowledge brokering. BMJ: British Medical Journal, pp.129-132) with a matched funding requirement to build on the funding provided by the NIHR contract. The match funding needs to be at least to the level of the NIHR award (match £ for £), each CLAHRC needing to achieve a portfolio of £10 million match over the five year period in order to drawdown funds from NIHR.

This model offers the opportunity for collaborating organisation to provide match funding on mutually beneficial activities. Match funding is also used as a mechanism for partnership engagement and co-production as we seek to respond to our partners’ priorities and needs.

We have strong audit processes for match funding contributions by partner organisations.

There are six types of match available:

1. Cash match: real cash from a range of sources that can be used to add to the Theme budgets.
2. ‘Match’ in kind: ‘People time’. Collaborating organisations will provide ‘people time’ on theme activity/ further grant preparation/project negotiation and priority setting.
3. ‘Match’ in kind: NHS desk space/meeting space. The NHS may also count desk space as match in kind. Universities may not count infrastructure as match.
4. Fee waivers from universities/White Rose networks.
5. Research project costs not funded by the NIHR grant. Such as NHS excess treatment costs for NHS organisations.
6. Industry providing hardware, software, and services, or reduced cost services within research and evaluation activity.

Match linked to industry 2015/2016

Our income from industry partnership has increased significantly over the past year (£883,240) specifically due to increased activity with Sensory Technologies. The Frailty theme is working with diverse matched funded partners on the electronic Frailty Index (eFI), with notable support from Industry (£200k). We have also developed three new industry collaborations from which we hope to gain further match in 2016-17.

<table>
<thead>
<tr>
<th>Industry partner/collaborator</th>
<th>Match 2014-2018</th>
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<tbody>
<tr>
<td>Sensory Technology</td>
<td>1,380,513</td>
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<tr>
<td>Academic Health Science Network</td>
<td>527,792</td>
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<tr>
<td>Mylan Ltd</td>
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<tr>
<td>Tiger Team</td>
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<td>The Phoenix Partnership</td>
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<td>Medipex</td>
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<td>Kinematix</td>
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<td>Longhand Data Ltd</td>
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<tr>
<td>Patient Opinion</td>
<td>5,000</td>
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<td>Sheffield International Venues</td>
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<tr>
<td>Health Tracker</td>
<td>250</td>
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<tr>
<td>Other</td>
<td>545</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>£2,441,775</strong></td>
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Industry Collaborators

We now have a range of industrial partners that have products and services we are utilising in our research and implementation activities that address all eight of the digital capabilities that NHS England are assessing, through their digital maturity and commissioner development portfolios.

**Health Tracker™**

Health Tracker™ are working with Clinicians and academics at Sheffield Children’s NHS FT and the University of Sheffield to create a bespoke electronic database to capture and monitor long terms outcomes of children and young people with ADHD, and continues to support the Tracking ADHD Cohort – Sheffield (TrACS) project. [http://clahrc-yh.nihr.ac.uk/our-themes/telehealth-and-care-technologies/projects/adhd-health-tracker](http://clahrc-yh.nihr.ac.uk/our-themes/telehealth-and-care-technologies/projects/adhd-health-tracker)

**Kinematix Ltd**

Kinematix Ltd collaborate with the University of Sheffield on the intelligent shoe’ for self-managed rehabilitation for stroke survivors. This long standing collaboration has resulted in a number of research publications, and translation of the concept to Musculoskeletal rehabilitation and the management of patients with peripheral neuropathy. Kinematix work in partnership with IEE, who provide sensing solutions, which is now integrated into the Intelligent Shoe. We anticipate IEE becoming a formal collaboration in 2017.

[www.kinematix.pt](http://www.kinematix.pt)  
[www.iee.lu/en](http://www.iee.lu/en)

**Longhand Data Ltd**

Longhand Data Ltd collaborated on Industrial Knowledge Transfer project to explore the development of outcomes measures for mental health. [www.longhanddata.com](http://www.longhanddata.com)

**Sensory Technology Ltd**

Sensory Technology Ltd is working collaboratively with NIHR CLAHRC YH on the EnComPaSS project at St Luke’s Hospice in Sheffield. The digital platform provides a novel technology solution for delegated nursing acts in the management of end of life patients and early supported discharge for patients with chronic diseases.

[www.eshiftcare.com](http://www.eshiftcare.com)

**Tiger Team**

Tiger Team have developed a data collection platform (software application) for CARE 75+ to enable a complex research study. They have provided a considerable amount of match funding. Additionally, they have developed an on-line data collection tool for the Care 75+ study to enable better spread to external sites. With input from MEDIPEX, we have been able to licence the product for use by other institutions. [www.tigerteam.co.uk](http://www.tigerteam.co.uk)

**TPP ResearchOne**

TPP ResearchOne have worked with our Primary care based Management of Frailty in Older People theme on the development of the electronic Frailty Index (eFI). This eFI is now implemented into SystmOne and EMISweb. The eFI has won a national award, the Healthcare IT Product Innovation category at the EHI Live 2016 Awards.

[www.tpp-uk.com](http://www.tpp-uk.com)
New Industry Collaborations

Over the last year we have developed three new collaborations with companies utilising our assessment criteria for collaboration developed last year as part of our industry strategy. [http://clahrc-yh.nihr.ac.uk/industry/clahrc-yh-industry-strategy](http://clahrc-yh.nihr.ac.uk/industry/clahrc-yh-industry-strategy)

NIHR CLAHRC YH Industrial Partner Selection.

The process for assessing potential industry partners follows the following pattern:
- approach by potential industry collaborator
- mapping of innovation to appropriate NIHR CLAHRC Theme(s)
- following initial meeting an exploration of potential partnership
- assessment criteria used to establish mutual synergies and potential future plans

### Dynamic Health Systems (DHS) Ltd

Dynamic Health Systems (DHS) Ltd, a partnership of innovative clinicians with an affinity for IT, business transformation experts with experience in health, and experienced solution designers who understand critical systems. DHS has made a significant investment to create a series of solutions aimed at resolving major and system wide problems of today. We anticipate working more closely with this company linking our self management technologies to their visucare product.

[www.dynamichealthsystems.co.uk](http://www.dynamichealthsystems.co.uk)

### Runscribe™

Runscribe™ is a US based company (SME) that has developed over the years a wearable fitness product that provides kinematic metrics that help an athlete understand how factors like shoe selection, terrain and fatigue impact their running mechanics. Whilst the product is designed for the data driven athlete, we are working with the company and with their UK academic partners at Sheffield Hallam Sports Science Research Centre, to translate the concept into a health care application for stroke survivors to self-manage upper limb movements within a self-managed induced constraint paradigm.

[runscribe.com](http://runscribe.com)

### Northgate Public Services (NPS)

Northgate Public Services is a software and outsourcing business with extensive experience in the public sector, including health. We are collaborating with them in the design and evaluation of an innovative new solution which will improve the provision of information to patients. CLAHRC support is helping to formally evaluate this by involving potential users.

[www.northgateps.com](http://www.northgateps.com)
Impact Case Studies

Below are three examples of industry projects within NIHR CLAHRC YH. More information about these projects can be found on our website [www.clahrc-yh.nihr.ac.uk](http://www.clahrc-yh.nihr.ac.uk)

Development of the electronic Frailty index (eFI) and integration into national primary care systems.

The eFI identifies frailty using routine data (Read codes) in primary care. It is calculated using existing electronic health record data and does not require an additional clinical assessment. The frailty index is made up of 36 deficits comprising approximately 2,000 Read codes and is presented as a score. It allows frailty to be identified and severity graded, enabling GPs to identify the frailest people within their practice. eFI is now available to around 90% of GPs in the country as it is integral to both SystmOne and EMIS systems.

The Frailty theme worked with match-funded industry partners at TPP/SystmOne, a UK-based company that provides electronic clinical systems for GP practices, and developed, validated and implemented an electronic Frailty Index (eFI) that uses existing data to identify and grade frailty states.

Enhanced Community Palliative Support Service (EnComPass) and Sensory Technologies.

The TaCT theme has worked with a Canadian company, Sensory Technologies, to implement and evaluate a proven model of technology, whereby community-based care providers deliver palliative care under the online supervision of specialist palliative care clinicians, thereby extending the capacity of clinical palliative resources in the community. A cohort of community-based nurses began using the system on January 18, 2016, and now over 300 patients are registered on the system and are receiving home visits enabled by this approach to care delivery. As a result of this collaboration, Sensory Technologies has invested in a UK base in the Bio-incubation unit at the University of Sheffield, with an expectation that this UK base will provide a gateway to Europe and attract significant investment in the region.

The evaluation of this implementation at St Luke’s Hospice, Sheffield, has resulted in a significant improvement in care for patients at the end of life, cost saving to the Trust providing acute care, and a new workforce configuration providing greater reach into the local community.

Runscribe™ and Stroke Research

The TaCT theme has worked with an American SME, translating a product designed for athletes for use as a health care application for stroke survivors. We anticipate integrating the developed and tested hardware and algorithmic models into our rehabilitation ‘SMART’ platform, using the captured powerful sensor data to show stroke survivors how much arm movement they have undertaken during a day. The data is also being compared to age matched controls and with a commonly used practical standardised upper limb tests for validation purposes. The technology was bought by the National Centre of Sport and Exercise Medicine (NCSEM), and is match funded into the Self Constraint Induced Movement study described above.
Industry Challenges in the NHS

Driven by the Five Year Forward View, the NHS now looks to procure products offering value in terms of cost, patient outcomes and improved efficiency in a system which must do more with less.

For a healthcare company developing new products, it has never been more important to have a clear value proposition demonstrating the benefits of your product in a crowded marketplace.

What is a value proposition?

Quite simply, it is a clear statement that explains how your product or service solves customers’ problems or improves their situation (Relevancy), delivers specific benefits (Quantified Value) and tells the customer why they should buy from you and not from the competition (Unique Differentiation).

But how can you express these three components in terms the NHS will understand?

NHS quality indicators

The NHS evaluates performance in accordance with a series of frameworks and indicators that ultimately influence commissioning. These include the NHS Outcomes Framework (clinical outcomes and patient issues), QIPP agenda (efficiency and cost savings), CQUINs and Quality Premium (menu of locally agreed targets).

These indicators are not only relevant to NHS commissioners however. It is expected that new medical devices, diagnostics and pharmaceuticals help the NHS achieve these targets, and as such they need to be considered as design inputs for new product development; address them, and you will be aligning your product directly with the needs of the NHS, de-risking your investment.

Aligning your product with these quality indicators = a strong value proposition

NHS Indicators offer clues towards both broad and very specific problems the NHS is attempting to tackle.

By understanding and designing to these needs, you are identifying solutions to established problems (Relevancy), delivering specific and measurable benefits (Quantified Value) and presenting a strong rationale for why the NHS should be buying your product and not one from your competitor (Unique Differentiation).

medilink.co.uk
Industry working in the NHS

We asked Patrick Blanshard, Co-founder and CEO of Sensory Technologies, for his views and experiences as an Industrial partner working in the NHS.

What do you see as the main barriers to working in the NHS?

I would say the largest barrier has been establishing credibility and getting an initial foothold with a meaningful project, both of which we managed to do and not without significant outside help. It takes time to build relationships and establish credibility, regardless of how great one’s innovation is or the significant impact that it will have when adopted. Getting things off the ground are always the hardest part.

I don’t believe that the challenges our company faces are any different from a company approaching the NHS from the outside, whether that is in continental Europe or as a start up in the UK. We did have the benefit of bringing evidence from Canada into the UK as proof of the validity in the model of care and our proprietary technology, our own capital to fund local projects and we established a UK office and staff presence early on to ensure that any potential partners would be dealing with a UK entity.

What are the drivers for you from a commercial perspective?

As a Canadian headquartered company working in the healthcare space we look to the UK as a very logical market entry point. The similarities of our health economies, demographics, reimbursement models, patient experiences and most importantly the challenges that we collectively face with an aging population who have come to expect their world class healthcare system to not only be there for them but to improve all lend to the UK being an ideal place for Canadian innovation to take root and vice versa.

Innovations that we develop in the UK are directly applicable in our Canadian market and have similar benefit in our European pursuits.

What are the benefits of working with NIHR CLAHRC YH?

The benefits of working with the CLAHRC have been many. Top of mind is the early validation of our Canadian outcomes, introductions to potential partners, funder introductions and the support that was provided to potential UK clinical partners to visit active patient sites in Canada and to build direct relationships with clinical and commissioning organisations. The early validation provided by the CLAHRC proved to be critical to a successful joint application for NHS Nursing Tech funding that led to our first UK pilot going live in 2016.

‘NIHR CLAHRC YH has been instrumental to our early success.’

Within our unique funding model you have provided £1.3million to date in match

As Encompass was our first project in the UK we were prepared to support significant development and project efforts to build in enhancements that benefited the UK site as well as our international partners. The project itself included two new enhancements that we considered to be universally applicable and the decision to direct a large portion of our project budgets to the project came relatively easily.

As the project progressed international interest grew and we have recently brought the enhancements created in the NHS funded environment back to Canada and to the US.

How has the NIHR CLAHRC YH Research team added value to Sensory Technologies?

Primarily the early validation of our work was a major benefit along with supporting project design and funding applications that incorporated rigorous academic oversight.

Having our first UK project successfully completed with outcomes validated by the NIHR CLAHRC YH is a major step forward in our plans to continue to drive significant positive change in the UK healthcare system.
We asked Dr Val Harpin, a consultant paediatrician at the Ryegate Children’s Centre, to describe the challenges of working with industry and the lessons learned.

It has been a long-term aim of mine to develop a research cohort of children and young people with ADHD and to monitor their outcomes into adult life. Studying such a cohort would give us the opportunity, for the first time, to analyse our services for this vulnerable group. When NIHR CLAHRC YH funding gave us the opportunity to start to make this a reality, my colleague Dr Nevyne Chalhoub, and I, were delighted.

We had found a company, involving clinicians in London, which had developed and validated online questionnaires appropriate for use in the diagnosis and monitoring of ADHD symptoms and general wellbeing. These included animated questionnaires which could be used with children as young as five. We negotiated with the company and began an initial trial with 18 clinicians, 70 families and teachers.

The trial was really positive although we did find that a system which had previously been used primarily as a research tool needed changes to make it fit smoothly into busy NHS services. We took on board the views of those who had helped us in the trial period and began to design the system we felt would be the cornerstone of our research cohort. Since then we have found ourselves in a steeplechase with one unexpected hurdle after another:

**Tendering**

Of course it makes sense always to get more than one quote. So we did. We went through complex discussions with another company who seemed the next nearest fit to our needs. The outcome was that our original choice was the best fit.

**EU tendering**

The final quote came over the cost limit at which an EU tender was needed, and the news that this process could take six months was a blow. Nonetheless, we did the work up for an initial proposal. By the time we had done this, the cost limits that trigger the necessity of EU tender had risen to above our quote!

**Finance**

The cost was still too high to go through our Trust without scrutiny. Now we had to take our proposal through finance committees. They liked our proposals and recognised that actually the money we are using does not belong to the Trust and we were not asking for financial investment. NIHR CLAHRC YH monies and grants from Pharmaceutical companies had already been obtained to fund this.

**Changes in staff**

During this timeline many staff move on in most departments. Some pass on the baton and some do not. Record-keeping is paramount. Keeping every email and recording every conversation is vital, although not always enough.

**Contracts**

NHS contracts for service provision are 120 pages long and contain language we clinicians did not understand. They did not really fit our needs but we are going to be using our data collection system as a clinical as well as a research tool so we were told we needed to use this format. We hope we are finally getting through this, but in a small Trust only one busy individual holds the key to the language we have to understand.

**Ethics**

Getting to this point has taken so long that our original ethics work was out of date and had to be redone. This included new peer reviews; asking busy colleagues to give us even more time.

**Information Governance.**

Safe data storage is paramount in NHS services. As our work involved collecting data we were very conscious that this data needed anonymising, and involved filling in bulky documents for the Trust’s IT department. Thankfully in this area we had a helpful guide.

The winding path we have travelled has been made possible so far by fantastic team members, support from NIHR CLAHRC YH, the generally very pleasant people we have met along the way, and the strong ongoing support for our project from all we explain it to.
This briefing presents independent research by the National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care (NIHR CLAHRC YH). www.clahrc-yh.nihr.ac.uk. The views and opinions expressed are those of the authors, and not necessarily those of the NHS, the NIHR or the Department of Health.

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