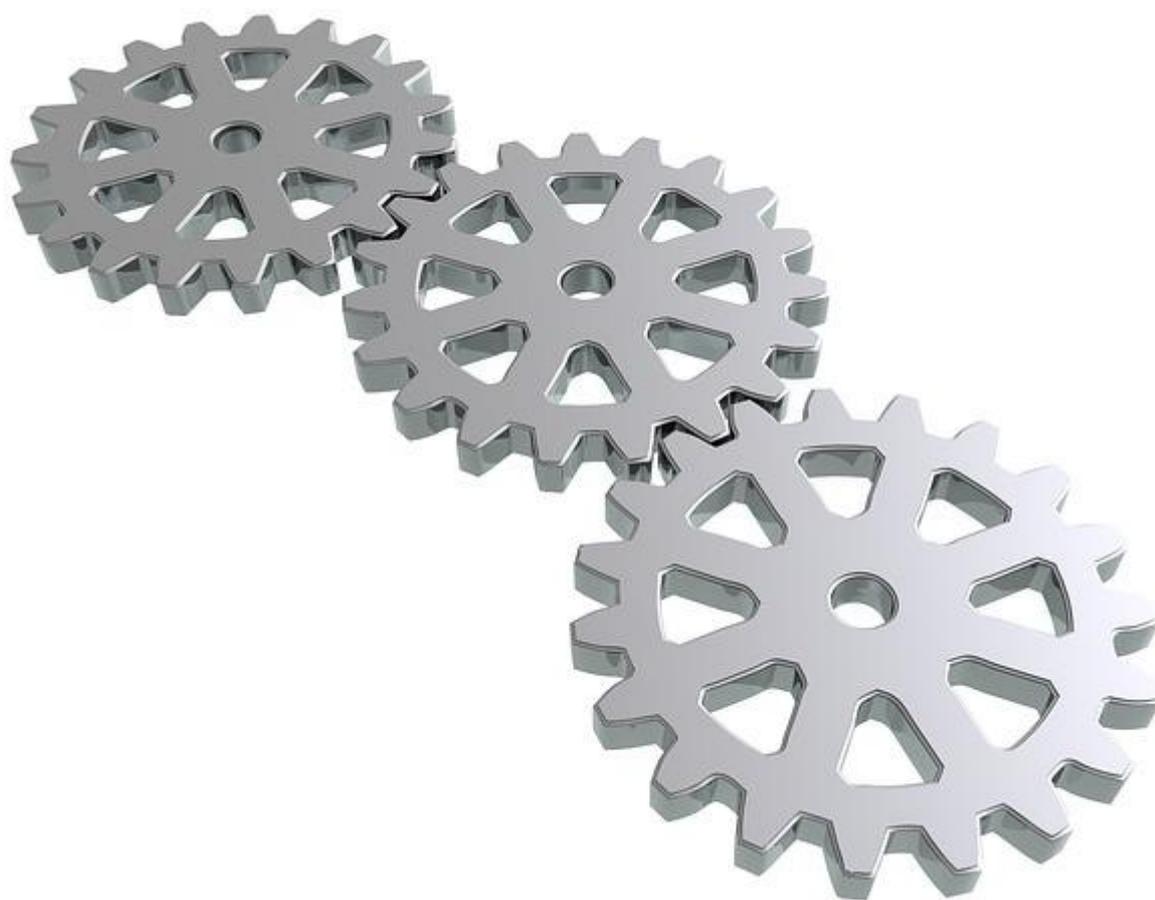


NIHR CLAHRC YH Industry Engagement Strategy



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1. Introduction

This document sets out the strategy for the National Institute for Health Research, Collaboration for Leadership in Applied Research and care Yorkshire and Humber (NIHR CLAHRC YH) to engage with industry building on the established relationship we have with a number of industrial collaborators. It identifies our processes and mechanisms by which we wish to work with NIHR Office for Clinical Research Infrastructure (NOCRI) who help us identify potential partners and ensure access to our expertise is simplified for industrial partners who are unfamiliar to us and with the NIHR infrastructure.

1.1 Background

As a CLAHRC, our success and impact over the last five years 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.

More importantly, we have generated commitments of over £14 million of match funding for CLAHRC Yorkshire and Humber - a significant amount, especially at a time of financial restraint in public services.

Our CLAHRCs have pioneered a new way of working, to ensure co-production and partnership engagement in research and evidence implementation. Over the past five years CLAHRC YH has developed a strong emphasis on working with industry as a research and implementation broker where research and development evidence exist within a given clinical area. Through this partnership work we have been able to negotiate matched funding from a number of industrial partners locally, nationally and internationally. Developing joint funding relationships enables opportunities, especially in the field of telehealth and telecare.

With the publication of 'Innovation, Health and Wealth: Accelerating adoption and diffusion in the NHS' by the Department of Health in December of 2011, and the subsequent publication of designation guidelines for the Academic Health Science Networks (AHSNs) it has become even more apparent that the government's 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 companies such as Perkin Elmer, to national companies such as TPP, and includes small and medium-sized enterprises (SMEs) such as Longhand Data, Kinematix and Sensory Technologies. Our focus has been to work with industrial partners that align with our research themes and hence, in comparison with other CLAHRCs, we have not sought to partner with the Pharmaceuticals industry and to focus more on the medical device sector. 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.

1.2 Vision for working with industry

Few sectors have seen change on the scale witnessed by those in health and social care over the last few years. Increasing demand, pressures on the public purse and technological developments are driving significant changes in the way health and care is delivered.

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. These employ 64,000 people and generate around £15bn in turnover.

Yorkshire is perfectly positioned for growth - with NHS England based in this region, a strong base of medtech and technology enabled care firms and coterminous CLAHRC and AHSN resources to spearhead the use of innovative products and services in the NHS.

The recent NHS Five Year Forward View (5YFV) and National Information Board's paper on Personalised Health and Care 2020 highlights that digital technology plays a key role in all three elements in the 5YfV: public health, quality of care, 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. CQC and Monitor will be assessing an NHS organisation's digital maturity as part of their routine quality metrics and so we can expect to see a much greater interest in the effective deployment of new technology in coming years. This will require close partnership between commissioners, providers, academia and industry to ensure funds are well spent.

Our CLAHRC's industry engagement strategy will enable the private sector to capitalise on the great medical and clinical expertise housed within the region's universities and research centres. It will also ensure patients have access to the latest developments enabling better outcomes at an affordable price.

Our range of offers to industry includes:

- Support the development of partnerships between industry and NHS/LA
- Implement and evaluate evidence based technologies for chronic disease management.
- Research health economics and new models of care utilising existing technologies
- Scope stakeholders to validate technology needs
- Contextualise existing technologies for different environments
- Utilise participatory design methodologies in partnership with industry
- Gain new funding streams for research partnerships and KT with industry

Each of these initiatives help ensure that the NHS and Local Authorities have access to technology solutions that enable a transformation in the way they work to improve outcomes, productivity and cost effectiveness. For industry these initiatives help ensure that they address real needs and that their solutions are fit for purpose and affordable. We can also ensure that industry finds the most suitable customer and that commissioners and providers are presented with solutions that fit their respective requirements as they can have a considerably different emphasis.

1.3 Objectives

The CLAHRC Yorkshire Humber measures the success of its industry engagement strategy on building a small number of very high value relationships.

Our CLAHRC's goal is not to merely complete a single transaction, but to help forge a long-term relationship with our industry partners that promotes the advancement of science and education, and assures that discoveries and inventions are converted to useable products and services to benefit the public.

We currently have five high value industrial partners and over the next two years we expect to increase this number to no more than eight. We are sure that we can provide the support necessary to this number of strategic partners to ensure a positive experience for all involved. 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. Recent events such as the launch of the Centre for Assistive Technology and Connected Healthcare (CATCH) centre at the University of Sheffield, attracted dozens of industry organisations. We see the relationships with these stakeholders as being key to the dissemination of our products and for raising awareness of the full range of CLAHRC YH activities. Engaging with industry and community is a dialogue. A key feature of our ambition is for CLAHRC to increasingly act as a 'meeting place' 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. However, other than from a communication and networking perspective, we do not plan to dedicate resource to managing the relationship with these bodies.

In the longer term we will review our partnerships to ensure that they still align well with our core research themes and to embrace any transformational technology areas that emerge.

2. Industry Focus

In terms of patient cohorts our research themes major on:

- reducing avoidable hospital attendance and admissions
- Primary care management of frail elderly patients
- Child health
- People with mental health conditions in parallel with other physical health needs.

The emphasis of our work is in examining how medical device technology, and most often digital technology, can address the needs of these cohorts. We see this sector as our primary focus for industry engagement and have a track record of success in this area. Associated with these technologies we have a keen interest in health economics, public health, outcomes measurement and how we take new technologies, and the associated revised care pathways, and implement them successfully.

Unlike many other CLAHRC's we do not undertake significant activity with the pharmaceutical and biotechnology sectors. This ensures our national contribution is complementary to other CLAHRCs and that we continue to be the leading CLAHRC for technology enabled care services.

We engage with a wide range of organisations involved in providing remote care in order to improve patient experience and enable care closer to home (telehealth, telecare, telemedicine and Telecoaching sector). CLAHRC YH had considerable input to the recent NHS England resource for Commissioners on Technology Enabled Care Services: <http://www.england.nhs.uk/ourwork/qual-clin-lead/tecs/>

We therefore have had contact with all the industry partners consulted as part of the development of this guidance.

3. NIHR CLAHRC YH Offer to Industry

3.1 Expertise and capabilities

Between them, Leeds and Sheffield City Regions boast the one of the largest concentration of universities in Europe, with 10 institutions producing over 80,000 graduates a year.

Leeds is home to the headquarters of four of the most important UK national health service bodies: NHS England, responsible for £100bn+ annual healthcare spend; the Health & Social Care Information Centre, home of the national health and social care data collections; the NHS Leadership Academy; and Health Education England, the national body responsible for organising health and healthcare education and training.

The region also has two of the largest teaching hospitals in Europe and a population of over 6 million citizens. The CLAHRC research cohort has over 27000 patients who have consented to being involved in future research: <http://www.yorkshirehealthstudy.org>

We also have collaboration with one of the major primary care system vendors that has allowed us to mine anonymised health data from 500,000 UK citizens:

<http://clahrc-yh.nihr.ac.uk/our-themes/primary-care-based-management-of-frailty-in-older-people/projects/development-of-an-electronic-frailty-index-efi>

3.1.1 Technology

Technology alone can't deliver a transformation in care, but when embedded in a wider package of care and new ways of working, the combined innovation can have a powerful impact on improving patient outcomes and reducing inequality.

Professor Sir Bruce Keogh KBE, National Medical Director, NHS England has stated that:

Technology has the power to radically transform the way we deliver healthcare by enabling all patients to take a more active role in their own health and increase prevention through supported self-care. By capitalising on new and emerging technology we have the opportunity to provide a modern model of continuous, coordinated care centered on the individual, with professionals acting in partnership with the person to improve their health and wellbeing.

CLAHRC YH believe that certain key technologies can help sustain the NHS in times of reduced budget and higher demand. We aim to have a leading role in the development and adoption of 'technology enabled care services' (TECS). TECS refers to technologies (such as telecare, telehealth, telemedicine/teleconsultation and self care apps) that help people to manage and control chronic illness and sustain independence. They enable the remote exchange of information, primarily between a patient or citizen and a health or care professional, to assist in diagnosing or monitoring health status or promoting good health.

3.1.2 People

➤ *e.g. Key opinion leaders, clinicians, providers of service, carers, service buyers/users*

Everyone in CLAHRC understands that they have a responsibility for engaging with industry. All recognise that industry are key to the success of CLAHRC.

We recognise that the level of engagement will vary depending upon role and seniority; however, everyone knows that if they work in CLAHRC they will also be working closely with industry

There is support for junior academic professionals to get the knowledge and skills needed to make the best use of collaboration with industry. This is often achieved through shadowing and mentoring with more experienced staff.

CLAHRC has an extensive network of NHS clinicians, NHS managers/commissioners and academics who have a keen interest in improving outcomes and cost effectiveness of health and care services. The CLAHRC Programme Office maintains a database of all clinical and commissioning staff who are associated with CLAHRC and their areas of interest. In that way we can be sure that we sign post any industry contacts to the right staff.

Industry often need a critical friend to help them develop products and services that meet a real need and also to market them in a way that is appealing to the target audience.

By linking key CLAHRC staff with our industrial partners we can help ensure both of these goals are achieved. We can also help ensure industry understands the roles and responsibilities of different organisations in a rapidly changing NHS ecosystem.

3.1.3. Facilities and specialist equipment

CLAHRC YH has access to a number of facilities that are second to none in the UK.

The CATCH is researching new user-friendly technologies to enable people to live independently. CATCH builds on a world-leading interdisciplinary research base across assistive technology and connected healthcare at the University of Sheffield. CATCH are establishing a Home Lab which will offer a new way of working. The Home Lab will mimic the home or care environment and allow volunteer users to simulate living normally, testing a range of technologies whilst being observed and evaluated by researchers. It will act as a bridge between the laboratory-based research environment and the homes of people in the community. Bringing patients, carers, clinicians and researchers together into this unique environment will allow researchers to carefully analyse and understand the challenges faced by individuals, and work with them to design, develop and produce novel and practical solutions. The Home Lab help enable the translation of research into real-world products and services.

In addition The Cultural, Communication and Computing Research Institute (C3RI) is Sheffield Hallam University's largest and highest rated community of researchers; a large majority of our work was recognised in the 2008 UK Research Assessment Exercise (RAE) as being of international significance. Design Futures, is a discrete unit within C3RI delivering packaging and product design, research and development to industry. A Design Futures has a proven track record as innovators being cited as inventors or contributors to a portfolio of intellectual property, it has accrued a number of design awards. Research activity included creative practices in healthcare; advanced making processes and theory; social, cultural and philosophical narratives; and applied research in digital media.

York St John University have the Centre for Enabling Environments and Assistive Technology (CEEAT). Their expertise includes a detailed knowledge of conditions and functional capability within dementia and other long-term conditions. They collaborate and share knowledge with partners including manufacturers, public, private and third sector service providers, the general public and students.

Through knowledge exchange projects and learning and teaching they aim to:

- champion and promote person centred assessment and provision of services to support independent living
- promote 'personalisation' agenda of choice, control, early intervention and prevention
- promote person centred design of assistive technologies and environments
- evaluate and disseminate best practice

Hull University has a Centre for Telehealth that brings together telehealth expertise from academia, primary and acute care, local authorities, industry and third sector partners to develop the new service concepts in telehealth that will form the future basis for telehealth service delivery in the NHS and elsewhere. Telehealth within Hull is coordinated by the eHealth Stakeholder Goup, and operates from a joint budget from NHS Hull and Hull City Council.

The National Centre for Sport and Exercise Medicine (NCSEM) is an Olympic Legacy project awarded to only three cities in the UK – London, Loughborough/Nottingham and Sheffield. There is much evidence that physical activity improves health and reduces load on the Health Service.

The vision of the NCSEM is to create a culture of physical activity in Sheffield. This will be enabled using a 'whole-systems' approach combining; policy, environmental, community and individual level interventions and programmes of work. The centre seeks to extend the reach of sport and exercise medicine by the co-location of sport and exercise medicine specialists, allied health practitioners, researchers, clinicians and patients in an innovative and community focused hub and spoke capital facility model. Ultimately, the NCSEM will contribute, through research and delivery programmes, to the 'evidence-base' and 'economic-case' for the role of physical activity in achieving good population health and treating long-term conditions and chronic disease. A close working relationship exists between the Director of Research in the NCSEM and the CLAHRC through her joint role as theme lead in CLAHRC and public health specialist at ScHARR.

3.2 Links with the wider NIHR Infrastructure, NHS, other networks, centres and services

We have close relationships with both the Y&H AHSN and the Devices 4 Dignity (D4D) Health Technologies Co-operative (HTC). Collaboration with the AHSN has included joint development of a bid for Horizon 2020 EU funding for a digitally enabled palliative care solution that could transform the number of people whose wish to die at home is granted. The collaboration with D4D, also based out of Sheffield Teaching Hospital, allows us to direct activity to each other to ensure best fit with each organisations portfolio.

There are close links with all the 23 CCGs in YH through their YH Programme Director for New Technology, whom also works for CLAHRC YH for 0.5 days per week. This relationship helps ensure that the CLAHRC programme team can be signposted to the relevant NHS commissioners as required.

The CLAHRC YH, Yorkshire Health Study research cohort has over 27000 patients who have consented to being involved in future research: <http://www.yorkshirehealthstudy.org> This is attractive to industry as often the research process can seem very slow and cumbersome. By having pre-identified potential trial candidates we can ensure an efficient recruitment process.

3.3 Models of collaboration

CLAHRC YH can offer a wide range of services to industry. These include, but are not limited to:

- Facilitating Clinical trials
- Consultancy
- Data use agreements/database licences
- Equipment or facility use
- Fellowship agreements
- Giving guest lectures
- Joint grant applications
- Licences for use of copyright materials
- Service agreements
- Software licences
- Staff secondments
- Subcontracts
- Support for start-ups and spin offs from member universities
- Technology validation

CLAHRC has offers that dovetail with the industry R&D process. We allow industry collaborators to get involved at whatever stage of development matches their needs. This could be more basic research for exploring potential solutions in a broad subject area. It may be applied research for identifying solutions to targeted problems or a demonstration project for developing incremental improvements for an existing technology or service. More typically we may enter into specialized service evaluation for testing new and existing products in real health and care settings.

We clearly define the goals and missions of prospective research collaborations with industry. These interactions determine the type of desired relationship—e.g., bespoke consultancy or research project funding, industrial associate, sponsored research, gift etc.—as well as the type of intellectual property model.

The CLAHRC core team work with Medipex and our industrial partners to select and craft the appropriate agreement (often under NDA), along with the flexibility necessary to structure an intellectual property (IP) model that meets the needs of researchers and industry sponsors

3.3.1 Researchers and Industry

CLAHRC recognises that part of its success is in enabling its researchers to take key roles within industry. This is facilitated by our industry partners actively recruiting from our talent pool and also providing mentoring to researchers to ensure they have insights into the needs of the private sector and demands of the modern workplace.

There is mutual benefit in close working partnerships between academia and industry. Together we will produce the evidence that drives uptake of new innovations and learn how they are best deployed and sustained. The integrated nature of our collaborations leads to researchers having a much deeper understanding of what is involved in commercialising a product and creating economic value.

3.3.2 Patients and Industry

CLAHRC wants patients in the area to be consistently offered the opportunity to participate in clinical research and play a greater role in drug discovery programmes, the development of new technologies and creation of innovative medical devices.

We have an active PPI programme of work to engage patients and make sure their interactions with researchers and industry is safe, fair and effective. Patients are pivotal to translational research; they have a key role to play, either through involvement in focus groups or as a service user. Our programme of work means that they have potential early access to the newest forms of treatment together with the highest standards of medical care at no additional cost to the NHS.

3.4 Leverage of funding

We are able to offer support to industry in finding and applying for funding sources for their potential study. We have recent track record in working with industrial and NHS partners to seek EU Horizon 2020 funding and Nursing Technology Funding

NIHR CLAHRC YH may also be able to match industry contributions for projects of strategic significance.

4. How Will You Engage with Industry?

4.1 Nurturing existing industry relationships

NIHR CLAHRC YH has a number of existing strategic relationships with industry. These are active relationships that are maintained through regular collaborative engagement. For example the relationship with Sensory Technologies has been maintained by regular face to face meetings and Skype conversations despite key personal being based in Canada and other staff working in the USA. The success of such collaboration is evidenced by CLAHRC and Sensory Technologies winning NHS Nurse Technology Fund backing for a palliative care solution to be trialled in the NHS locally.

Going forward an account management approach will ensure that relationships are nurtured and the natural ebb and flow of activity does not impact upon the level of contact. All our strategic partners are invited to key CLAHRC events such as showcases and we often jointly engage in business development meetings to encourage investment in the region. Similarly industrial partners are invited to present at CLAHRC events e.g. <http://www.barnsleyhospital.nhs.uk/news/visit-yorkshires-only-hospital-innovation-day/>

For many years CLAHRC have publicised joint work with their industrial partners. This gives a wider audience visibility of the types of benefits this tightly knit working approach brings e.g.

<http://clahrc-sy.nihr.ac.uk/industry/copd-longhand-data>
<http://clahrc-sy.nihr.ac.uk/industry/smart-tomorrow-options>

In addition CLAHRC maintains a LinkedIn page that has many industrial partner connections.

4.2 Generating new industry interactions and relationships

CLAHRC recognises that it must reach out to industry so that they understand what we have to offer to them and also to explain how they can help further research and the development of researchers for mutual benefit.

We do this through:

- Widely promoting CLAHRC Member's achievements, current activities and expertise
- Publishing bit-size materials on our activities that are accessible to non-academic audiences
- Having an industry component to our website
- Engaging through our Special Interest Group Meetings with research themes
- Mailing our latest news and allowing industry to sign-up to our blogs on the latest innovations
- Hosting webinars and conferences on specific topics
- Having stands at certain national events attended by industry
- Working closely with the local regional development organisations to build close relationships with industry
- Liaising with the AHSN and UKTI to build new industry relationships
- Inviting industry to researcher showcases
- Hosting hackathons and sandpits

CLAHRC works in close partnership with Medipex to identify industry partnerships that could be mutually beneficial. Similarly the Y&H AHSN and D4D will sign post organisations to CLAHRC if they believe there is a fit with the businesses requirements.

CLAHRC has been building relationships with University business development teams. Many of these teams have Business Development Managers (BDMs) who represent the first port of call for an organisation seeking engagement with the University on a commercial basis. In some cases it may be that a relationship with CLAHRC is mutually beneficial. This is an area CLAHRC wishes to build on in 2015/16.

4.3 Working with NOCRI

The NIHR CLAHRC for South Yorkshire made significant progress in engaging with industry, particularly with the medical device and technologies industry, which was recognised and commended by NOCRI. NOCRI met with CLAHRC SY and discussed in detail how they can support CLAHRC engagement with industry.

NOCRI's role in promoting the NIHR infrastructure will ensure general visibility of the CLAHRC Yorkshire and Humber to industry. NOCRI will signpost and facilitate introductions to NIHR CLAHRC YH as and when appropriate.

5. Management of Industry Engagement

5.1 Processes

Following an approach by industry whether this is through NOCRI or other avenues, we will undertake a mapping of the innovation to our existing themes and an assessment criteria will be used to establish the viability of developing a new collaboration. See Appendix 2 Industrial Partnership Section Criteria.

5.1.1 Innovation and Knowledge Transfer (IKT) Leads

CLAHRC will follow a Knowledge Transfer approach for our key industrial partners. This aims to reduce the burden of involvement in research and helps ensure all parties receive the outcomes they desire from the partnership.

Every Industrial partner will have an IKT lead whose role will be to:

- The point of contact for key communication with CLAHRC.
- Confirm the partner's requirements and direct collaborative activities within CLAHRC and externally to other partner organisations and NIHR infra-structure.
- Produce updates for the partner and also gathers information from the partner that CLAHRC needs for its reporting processes.
- Create long term relationships with the portfolio of assigned clients
- The IKT lead does not necessarily manage the research and implementation associated with the industrial partner.
- Negotiate and facilitate match funding investment into CLAHRC from industry partners.

5.1.2 Industry Enquiries

When an industry representative makes enquiries about CLAHRC, if the query is more than a general request for information, we direct them to our IKT team. In that way we can ensure we are asking the right questions to find out what they need, and presenting the information appropriately. We aim to build a good impression about the professional nature of CLAHRC from the outset. Relationships with industry are shaped from their very first contact, whether we are dealing with them over the phone, by e-mail or face-to-face we want them to gain confidence in the services we provide.

Our guidance should ensure that we capture routine information such as organisation, name, title, contact information, category of enquiry, enquiry detail, enquiry action, required response date and format.

It also helps ensure we:

- Deal with industry client enquiries efficiently and politely
- Maintain contact and exchange information with industry clients as promised by noting the outcome of conversations and what follow up communication is needed
- Noting whether industry client prefer to be contacted phone, e-mail or in some cases Skype
- Encourage industry representatives to clearly explain what they need
- Ask for advice and guidance when you are not confident in your understanding of the industry client's needs
- Manage industry client's expectations in responding to their information needs, in terms of potential limitations, timescales and any costs involved
- Direct industry clients who need specialist information or advice to those qualified to provide such support, provide contact details, make introductions or appointments, where appropriate
- Keep up-to-date and accurate records of industry client contact at all stages of the process
- Assure industry clients confidentiality at all times
- End contact with a client in a way that encourages them to contact you in the future
- Update our list of FAQs

5.1.3 NDAs, IP, Contracts

Medipex, the NHS Innovation Hub, will provide leadership on intellectual property (IP) to all parties engaged with CLAHRC YH including guidance, agreements and advice on IP strategy, determining IP ownership, rights and its commercial exploitation. Medipex was a partner on the successful NIHR CLAHRC for South Yorkshire programme, and led the IP strategy for the programme, and provided advice to all partners (NHS and HEI).

All parties wishing to work in collaboration with the CLAHRC YH programme will be required to enter into a Collaboration Agreement at the outset that sets out individually and collectively the rights and responsibilities of each partner in respect of ownership and exploitation of IP arising out of any agreed work.

Such an Agreement would provide a general framework within which all the parties would manage collaborations. However, the Collaboration Agreement would also take into account any specific rights relating to IP ownership and exploitation that NIHR or any other grant-awarding body may impose from time to time and also that the nature of individual collaborations between parties

The establishment of a spin out company, under certain circumstances, may be the most appropriate commercialisation route particularly where the IP could generate a significant commercial return but the short term development costs and risks deter industry from getting involved via the normal licensing route. Under such circumstances, the IP and the expertise of those creating it are used as assets to raise finance in return for an appropriate share of the equity. Medipex has successfully helped set up nine spin out companies from the NHS, of which several were joint NHS/higher education institutions (HEIs). This expertise in incubating spin outs is recognised by NHS and HEI partners engaged with the project and will help ensure that should there be any spin out companies the project will be in good hands in order to make the most of the opportunity.

The procedures that Medipex have in place for management of income arising out of commercial exploitation will be utilised for those project members that wish to make use of it. On behalf of its NHS members, Medipex has managed an IP pipeline of over 70 commercialisation deals and has been responsible for collection and distribution of more than £0.5million of royalty/commercial income.

Periodically throughout the CLAHRC programme a number of meetings and briefings were given by Medipex to research teams where there was an expectation that IP might arise e.g. TaCT, Stroke, Diabetes and where research staff asked for specific advice. The main topics related to issues around copyright, e.g. external research teams approaching CLAHRC to request use of research materials and output, publications at conferences etc. There were also issues around how to protect potential IP arising from multiple parties engaged in collaborative research without impacting on the research. Medipex produced a leaflet specifically for the project "Intellectual Property Rights (IPR) Factsheet for CLAHRC Researchers" which has been widely distributed. An initial audit across all work packages and clinical themes has identified approximately 20% of the 150 commissioned projects with potentially exploitable IP. Medipex monitors CLAHRC projects and works with specific project teams to develop IP strategies at an appropriate time in the project. <http://clahrc-yh.nihr.ac.uk/industry/intellectual-property>

5.2 Established obligations

CLAHRC ensures that any industry obligations embodied in funding contracts are met.

This includes:

- Engaging industry to help shape and steer the activities of CLAHRC to ensure the outputs are relevant to UK Plc.
- Engaging with industry to identify opportunities for research and development
- Ensuring an appropriate level of industry engagement in projects post award
- Creating real commercialisation opportunities for products and services
- Enabling UK academic/industry partnerships to be active in EU and Global research initiatives

5.3 Communication

The CLAHRC has a number of established modes of communication and has always profiled industry collaboration highly in public facing communications. To support and strengthen the industry offer we will develop an 'industry' facing document that will summarise the strategy and be a vehicle to promote case studies from our existing industry portfolio.

We will also collect testimonials in the form of videos that will be hosted on our industry webpages.

<http://clahrc-yh.nihr.ac.uk/industry/case-studies/sensory-technologies>

Our web site www.clahrc-yh.nihr.ac.uk receives over 1000 visits per month and has had visitors from over 60 different countries and our Twitter (@clahrchy) followers are up to 1044.

We have an active Blog (<http://scharr-rat.blogspot.co.uk>) about technology related innovation that is popular with industry and achieves around 1800 views per month. The figures for 2015/2016 are enclosed below:

	Blog hits per month	Average hits per day
April 2015	2747	88.61
May 2015	3026	97.61
June 2015	2185	70.48
July 2015	1997	64.42
August 2015	2354	75.94
September 2015	2346	75.68
October 2016	2301	74.22
November 2015	2180	70.32
December 2015	1708	55.1
January 2016	2433	78.48
February 2016	1803	62.17
March 2016	1815	58.55

5.4 Materials for Marketing and Promotion

We only wish to foster a small number of high value relationships and so we do not have a dedicated set of marketing material for industry. We do however have a range of generic marketing materials that highlight the achievements of CLAHRC.

5.5 Monitoring and Reporting

- CLAHRC reports on the status of its relationship with its key industrial partners at its Strategic Partnership Board meeting. This advisory board is able to support the programme team and comment on any potential new collaborations.
- Within our internal reporting structure (Theme activity reports TAR) we collect quarterly data on IKT, industry match funding investment and developing industry collaborations.
- Our annual report to NIHR has an industry focus where we describe our links with industry, the number of agreements signed with industry, and the number of non-disclosures signed with industry.
- There is an industry newsletter that highlights the work CLAHRC undertakes with its partners which is widely distributed and available on the website.

Appendix 1: Examples of Working with Industry

Perkin Elmer: Many countries now screen for a number of rare and not so rare conditions at birth as part of their routine public health provision. Sheffield has recently led the way, as part of the Genetics theme within CLAHRC SY, in adding a further five conditions for evaluation in a multi-centre study lasting one year. It is hoped that this will modify national screening policy in the months and years ahead.

The technical aspect of making these measurements on the tiny blood spot samples received by the laboratory is demanding but is probably the easiest aspect to control in any effective screening programme. In practice, it is the other aspects, collecting the sample and transporting it to the laboratory and ensuring that parents are notified promptly of the results together with ensuring the effective treatment of any 'screen positive cases' identified, that poses the greatest organisational challenge. The effective management and monitoring of all aspects of 'screening programmes' is strength in the UK, largely as a result of the infrastructure within the NHS and the careful scrutiny offered by our National Screening Committee. Indeed, it is the proper planning of these aspects in which emerging markets such as India and other countries need our greatest advice and support.

A joint venture between the screening services at Sheffield Children's NHS FT and a leading equipment and reagent manufacturer, Perkin Elmer, is exploring ways of offering these services within the Indian subcontinent and further afield. The UK India Business Council and NHS Global are helping to frame agreements, that it is hoped, will lead to the delivery of a well-structured service for users in India. Perkin Elmer will be able to provide and install the instrumentation and the hospital in Sheffield will be able to support specialised remote testing, training and education and on-going clinical support delivered by a telemedicine route. This is an exciting and generalisable means of employing specialist expertise available in the UK to partner health services in emerging markets, made possible by the collaboration of industry and the NHS and linked by leading edge IT developments.

The benefits for the UK and overseas healthcare providers are clear but perhaps the chief beneficiary will be the patients and families who are offered safe and effective programmes delivered to the same high ethical standards that we have become used to in the NHS. In doing so, we can add to the resources available within the UK to benefit patients and families in South Yorkshire and further afield.

TPP: ResearchOne is a health and care research database developed by TPP in partnership with the University of Leeds and the UK Government's Technology Strategy Board. The database consists of de-identified clinical and administrative data drawn from the electronic patient records currently held on the TPP SystemOne clinical system. It has the potential to be one of the largest healthcare research databases in the world, containing up to 28 million records.

As part of NIHR CLAHRC YH, Andy Clegg and John Young, from the Academic Unit of Elderly Care and Rehabilitation, University of Leeds, are working in collaboration with Chris Bates and John Parry at TPP/ResearchOne to develop and validate an electronic frailty index that uses existing electronic health record data to identify and severity grade frailty. This is now at an advanced stage and plans are in place for field testing of the electronic frailty index in GP practices as part of the AHSN Improvement Academy Healthy Ageing theme. The NIHR CLAHRC for YH are very excited to have this industry led resource so closely aligned to our academic partners in Leeds, and there is considerable potential for development of collaborative projects across CLAHRC themes using ResearchOne.

Kinematix: Researchers from the NIHR CLAHRC Yorkshire and Humber have incorporated a hi-tech insole, developed by local Sheffield company Kinematic, into a computer-based personalised self-management rehabilitation system. The Personalised Self-Management Rehabilitation System (PSMrS) has the potential to transform stroke recovery by enabling patients to self-manage their ongoing rehabilitation in the comfort of their own homes.

The PSMrS uses a set of pressure sensors to capture motion while stroke survivors practise vital rehabilitation exercises providing motivational feedback on weight distribution and heel strike two most common physical constraints leading to falls in stroke survivors. The technology also enables stroke survivors and physiotherapists to compare performance over the last three attempts and provides stroke patients with a percentage score. In addition, it can assess mood and monitor wellness with an inbuilt prompt for patients to ring an ambulance in an emergency or to speak to a GP if they are feeling unwell and/or have been feeling low for two weeks.

The innovative approach to post-stroke rehabilitation has also been reflected at ministerial level: the Rt Hon Earl Howe, Parliamentary Under Secretary of State for Quality, said: "We know that getting the best

possible support and rehabilitation is essential for stroke patients in order to help them regain their independence.” “I am delighted to see that money made available to researchers through the National Institute for Health Research is being used in such innovative ways and for projects which can make a real difference to the lives of NHS patients.”

The PSMrS was also presented to and applauded by Simon Denegri, chair of INVOLVE and NIHR National Director for Public Participation and Engagement in Research, during his visit to Sheffield Hallam University in December 2013.

Using a realistic evaluation methodological approach, the PSMrS is currently being tested with stroke participants at Sheffield’s Assessment and Rehabilitation Centre (ARC). Initial findings suggest that the system is highly welcomed by users and data indicates improved balance and heel strike over a four week period. Importantly, users report increased confidence and motivation to carry out everyday activities. In collaboration with clinicians and other researchers, the current stroke research team are also exploring the use of the intelligent insole with other long-term neurological conditions and in paediatrics.

Sensory Technologies: Professor Sue Mawson Director, NIHR CLAHRC Yorkshire and Humber, was approached by the CEO of Sensory Technologies a Canadian corporation developing and marketing mobile and web based enterprise systems for the community health care market.

Sensory Technologies were interested in the potential translation of their E-shift service into the UK health market. E-Shift is a technologically supported distributed model of delegated nursing care, that allows qualified nurses to support non-qualified staff in delivering home care to a range of patients through mobile and web based interfaces. They were particularly interested in how this model might be applied to Palliative Care settings, both in the community and in care homes.

The potential for this translation is being supported and evaluated by NIHR CLAHRC YH in partnership with St Luke’s Hospice, Sheffield. We have also established a Palliative Care Innovation Network for the region the purpose being to develop a research and implementation portfolio with our partner organisations. Following the successful brokerage between the SME and the NHS the company has set up its first European office in Sheffield, providing inward investment to the region.

Appendix 2: Industrial Partnership Section Criteria

NIHR CLAHRC Yorkshire and Humber Industrial Partner Selection

Process:

- approach by potential industry collaborator
- mapping of innovation to appropriate CLAHRC Theme(s)
- following initial meeting an exploration of potential partnership
- assessment criteria used to establish mutual synergies and potential future plans

Selection Criteria:

1. Strongly disagree
2. Disagree
3. Agree
4. Strongly agree

Table 1: Criteria completed with example partner

Industrial Partner Selection Criteria	Org 1	Org 2
Quick Check 1	ALIGNED	NOT ALIGNED
ALIGNMENT		
Alignment of core business with a CLAHRC Theme	4	1
Key Opinion Leaders in theme sector within Business	1	1
Innovative product/service portfolio in the sector	4	2
Clear purpose for collaboration identified	4	4
Must be ≥ 12	13	8
RESOURCE		
Willingness to dedicate resource (people) to joint aims	4	3
Willingness to dedicate resource (finance) to joint aims	4	1
Capacity to support intended joint ventures	4	3
Must be ≥ 9	12	7
COMMITMENT		
Willingness to sign partnership agreement	4	4
Willingness to promote joint activities with CLAHRC	4	1
Willingness to submit requirement management information to CLAHRC	4	1
Must be ≥ 9	12	6
	PARTNER	REJECT