TITCH
Technology Interventions transforming child health

NIHR | National Institute for Health Research

# Accelerating the clinical evaluation of medical technology in the NHS

## From industry to patients

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# Supporting Organisations

## Technology Innovation Transforming Child Health (TITCH)

TITCH is a national healthcare technology network that supports the development, adoption and diffusion of technology to support the health of children and young people. TITCH has identified over 100 unmet needs in child health. These needs have been used to gain funding and to develop solutions for children's healthcare. The TITCH network works with clinical experts in child health specialities and allied specialities across England. This includes specialist children's hospitals and centres, universities, NIHR infrastructure and Academic Health Science Networks. TITCH has supported numerous SMEs in accessing clinical experts in child health, leading to collaborations, funding applications, support for clinical research applications and access to the NHS supply chain. TITCH has linked industry with child and parent groups leading to new and exciting designs, collaborations and partnerships.

www.titch.org.uk
@titchinnovate

## NIHR Clinical Research Network Children

The NIHR is the most integrated health research system in the world, and the largest national clinical research funder in Europe. The NIHR Clinical Research Network (CRN) supported 231 new studies in 2017/18, and recruited 81,780 patients to studies involving children. The NIHR supports research studies through our funding programmes, training and support for health researchers, and through providing world-class research facilities. NIHR also supports dialogue between the life sciences industry and charities to benefit all, and facilitate the involvement of patients and the public to make research more effective. The Children's Specialty is one of over 30 Specialties which bring together communities of clinical practitioners to provide national networks of research expertise. The membership is made up of research-interested clinicians and practitioners at both national and local levels. The network ensures that the studies related to children included in our national portfolio of research receive the right support to ensure they are delivered successfully in the NHS.

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# Foreward

Rapid advances in technology have opened up a wealth of opportunities to advance the delivery of health care in the United Kingdom. From an early age, children actively integrate technology into their daily living. Investing early in the development of child health technology has the potential to make a significant economic impact and provide potentially sustainable solutions to the delivery of care in the NHS.

We are a country of children; under the age of 18, children make up 20% of our population yet they are 100% of our future, with a population size comparable to the total population of Belgium or Greece. The children of today will be the adults that access healthcare in the future. Thus there are a number of areas that require focus and support to deal with the challenges of improving the lives and health of well children on a background of social inequality, and supporting those with long term conditions as they grow, develop and move into adulthood.

The UK ranks 15 out of 19 Western European countries on infant mortality and has one of the highest mortality rates for children and young people in Western Europe. Nearly 1 in 5 children is living in poverty and there is a strong association between deprivation and mortality; for example infant mortality is more than twice as high in the lowest compared with the highest socio-economic groups.

Whilst not all issues relating to child health and disease will be solved by technology, the UK is in a strong position to use technological interventions including those that provide education and support to improve the health and lives of children and young people, particularly as many of the deaths in children and young people after infancy are preventable. Importantly for children and young people with long-term conditions the aim is to support sustainable change in the delivery of care, by using technology to support healthcare in the community and home, offering better societal and educational opportunities, in-turn improving the future health and wealth of the nation.

Mental health in children and young people also requires focus. Fifty percent of mental health problems are established by age 14 and 75% by age 24. We are already seeing new technology solutions to support cognitive behavioural therapy at home to improve

the lives of young people who may otherwise be waiting for long periods for assessment and care.

On 7th November 2017, senior stakeholders were invited to a meeting at the University of Liverpool in London supported by the National Technology Innovation Transforming Child Health (TITCH) Network and the NIHR CRN:Children to discuss the challenges faced by the medtech industry and public sector in bringing technology into the NHS. The group were tasked with considering solutions that may accelerate the process to ensure that children and young people in the NHS receive the best and most advanced healthcare. Stakeholder representation came from the following organisations:

Academic Health Science Networks (AHSNs)

Association of British Healthcare Industries (ABHI)

Association of Medical Research Charities (AMRC)

Association of UK University Hospitals

Aparito

Department of Health & Social Care

Health Innovation Network

Innovate UK

Medicines and Healthcare products Regulatory Agency (MHRA)

Medilink

National Institute for Health & Care Excellence (NICE)

NIHR Business Development

NIHR Clinical Research Network

NIHR Invention for Innovation (NIHR i4i)

NIHR MedTech and In-vitro diagnostic Cooperatives (MICs)

NIHR Evaluation, Trials and Studies Coordinating Centre

NHS England

NOCRI - National Office for Clinical Research Infrastructure

Northern Health Science Alliance (NHSA)

SBRI Healthcare

This important paper reflects on the roundtable discussions that took place during that meeting and subsequent discussions with delegates defining the challenges, needs and aspirations that healthcare partners have in accelerating the development and adoption of technology for child health and allied specialties.

- There was a collective desire to work collaboratively to ensure that systems were established to drive the evaluation and adoption of technology in the NHS and to avoid duplication of work across organisations and institutions
- Centralisation of processes was required to provide SMEs access to information relating to organisations supporting medtech, easier knowledge about funding opportunities, access to PPI, and an understanding of where and when to access support
- There is a need to avoid duplication between organisations developing systems to support medtech acceleration
- We need to develop a centralised process that could provide SMEs access to unmet needs prioritised by clinical need and strategic priorities.
- We need to develop national specialty centred priority setting groups to prioritise unmet needs across the life course.
- Training healthcare professionals at an early stage and providing access to training in specific areas of medtech development is fundamental to the integration of technology into the NHS.
- Communication between organisations is key to ensuring the development of processes that are well aligned across the innovation pipeline, and are easily accessible by SMEs.
- Delegates acknowledged the challenges faced by SMEs in navigating the complex landscape of the NHS and supporting organisations, and the need to provide clarity on processes and opportunities. Concordantly there was a will to work collaboratively to drive the acceleration of medical technology across the life course into the NHS.

Professor Paul Dimitri

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Director, NIHR Children & Young People MedTech Cooperative

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# Identifying unmet needs and supporting technology development

The innovation pipeline for medical technology development is driven by 'market pull' and 'technology push'. Market pull describes the unmet needs that focus technology development in specific clinical areas and diseases. In contrast, as technology evolves, the ability to advance the boundaries of healthcare investigation, diagnosis and delivery becomes greater, the so-called 'technology push'. How unmet needs are identified, prioritised and communicated has become a challenging issue in the NHS. There is a plethora of unmet needs that are potentially amenable to technology solutions. However, unmet needs need to be consider in the context of what is commercially viable for the private sector, whether solutions will be cost effective, and the scale of impact that technology solutions will have.

One of the main concerns voiced by agencies looking at technology solutions that may benefit the NHS is that technologies are developing in an emergent manner based upon the industry perception of unmet need. Because of this, technology solutions are difficult to introduce into healthcare, patients reject them, or they do not fit well into the service. Moreover, there are concerns that SMEs are attempting to push established technologies into other disease areas or towards a younger age group in a hope of creating a new commercial opportunity with limited understanding of the impact of their technology outside the original scope. This in turn leads to complications in the patient or the system, or rejection of technology at a high cost to the NHS.

However, there is a clear desire from healthcare agencies to support the early identification of emerging technologies and align this with known unmet needs. This involves a process of horizon scanning to identify relevant emerging technologies, whilst having a repository of unmet needs across specialities that are amenable to technological solutions. By aligning the unmet needs with merging technologies, and involving the relevant professionals, technology development for healthcare can progress in a more co-ordinated way. The process of identifying unmet needs is currently fragmented and opaque to industry. A number of healthcare organisations and networks have already undertaken work to identify unmet needs in areas of high disease burden, but the means of communicating these to industry remains challenging. Moreover, to ensure that funding and support is apportioned appropriately, key opinion leaders are required to provide a balanced opinion as to whether addressing particular

needs is plausible, an approach to commercial viability is required, and a horizon scanning exercise is required to determine whether solutions already exist to address the need. Thus a co-ordinated process in required to support the identification of key priorities at a regional and national level with a centralised process by which this can be communicated to others in the health sector and industry. Much of this work is already carried out in specific health domains by groups such as the NIHR MedTech and In-vitro Diagnostic

Co-operatives (MICs), AHSNs and SBRI Healthcare. However, SMEs need a much clearer understanding about these organisations and networks, the areas of unmet need, the funding opportunities available for technology development and the support available to them from the NHS and allied organisations. Moreover, unmet needs voiced by patients may not necessarily align with clinically recognised needs but may be vital in the management of conditions in the community and home. Thus a means of communicating patient needs in a centralised manner is also required.

## Recommendations

- Initiate a centralised process of horizon scanning for new technologies that could be amenable to development to support healthcare spanning all age groups
- Establish a process by which key opinion leaders identify priorities that is responsive rather than reactive to industry need i.e. drives technology development as opposed to identifying established technology to fit needs
- Develop a centralised process to store and access unmet needs including those from patients and their families. This process needs to be easily accessed by industry and managed centrally
- Develop expert panels in the UK to assess technologies developed for the clinical setting including an assessment of commercial viability based on need and implementation

# Moving towards medtech training in the healthcare setting

Whilst medical technology is moving at a rapid pace, health care professionals are only just starting to grasp the technology landscape, particularly as there can be significant differences in technology development and the innovation pipeline compared to the well established processes designed to carry out and deliver clinical research. In the same way that courses are established to support the delivery of training for research methodology, health professionals are now calling for similar courses to support the training of healthcare professionals about the innovation landscape.

Whilst training and support does exist in some areas such as the NHS Clinical Entrepreneurs programme and the National School of Healthcare Sciences, further training at a local or regional level is required. As training emerges, organisations either singularly or collectively need to take ownership of this training to ensure it remains updated in a rapidly evolving regulatory landscape and to ensure it is delivered effectively in a way that aligns with the needs of the NHS. For those areas where there has been success in developing and evaluating healthcare technology, with subsequent adoption and acceptance into the NHS, case studies should be developed to inspire clinicians to identify unmet needs and to consider working with industry to develop solutions.

The integration of training in technology and technological developments into the syllabi of undergraduates in healthcare has the potential to develop healthcare professionals that think differently in the future. One of the challenges to the delivery of undergraduate education is to deliver the training required for professional development whilst introducing new concepts to improve healthcare delivery in the future. Broadening horizons at undergraduate level by exposing them to the opportunities available for collaboration, as well as an understanding of other aspects of science that drives technology development will ensure a new generation of healthcare professionals equipped with the potential to radically evolve healthcare in the UK – a process of ‘building young minds for future healthcare’.

# Recommendations

- Introduce healthcare undergraduates to developments in other aspects of science and technology into their curricula. This in turn drives them to think about how unmet needs and challenges in healthcare can be addressed with technology solutions
- Develop training courses in health technology and innovation accessible to health professionals at a local, regional and national level
- For a portfolio of case studies to be developed that demonstrates areas of successful development and implementation of technology in the NHS to support industry and the public sector with examples of how to achieve success

# Creating opportunities for health technology evaluation and integration

The aspiration for the NHS should be to create seamless innovation pipelines from the identification of unmet need, through to technology development, subsequent evaluation and adoption of technology. Ultimately acceptance of new technologies by staff and users, in conjunction with commercial viability broadly define success. Moreover, iterative evaluation of new technologies will drive further improvements or support the need to move to alternative solutions. Inherent in this process is the need to involve service users and staff in technology design, and the need to relinquish outdated practice and technologies.

To support appropriate medical technology development, test beds should be established to provide a means of assessment. Health technology test beds can be established in or away from healthcare settings but should involve patients and service providers. When considering health technology integration into the home, community and hospital settings, the service pathway and environment should also be considered to ensure that technology integrates well into already established healthcare provision, or alternatively the service is adapted to adopt the new technology. Moreover, the impact of technology on the wider healthcare system needs to be considered. For example, technologies developed for use in community healthcare settings must consider the impact on the family home, school, employment and also the staff delivering care.

A **3i approach** could be adopted by newly established test beds:

**Indication**
Has the technology been developed appropriately for its intended purpose?

**Implementation**
Is the healthcare setting in a position to receive new technology and are the right processes in place to launch new technologies?

**Integration**
Can new technologies integrate into specific healthcare settings whilst limiting disruption or service delay/failure?

As UK healthcare develops it is important to adapt systems within the NHS to accept or incorporate novel technologies. For established healthcare organisations, the implementation of digital technologies is a major issue. The plethora of IT systems across the NHS as well as significant challenges with integrating technology into established platforms has created a significant barrier to the introduction of effective healthcare

technologies. At present there is no single or pragmatic solution to overcome this problem, but future proofing of NHS digital systems may in part help to address this. At a large scale, when new units or hospitals are developed, this creates an ideal opportunity to identify and incorporate new technologies that may improve or facilitate the better delivery of healthcare. Whilst this may incur additional costs, long term savings by introducing new technologies need to be realised, particularly where technology may facilitate the movement of healthcare delivery from hospitals to the community. The potential cost savings of introducing new technology to deliver healthcare extends beyond the delivery of healthcare itself, whereby children and young people receive better educational exposure, and lost work days for carers are reduced if care is delivered in a community and home setting, but is monitored by healthcare professionals in clinical settings.

In order to enable technology development and evaluation significant additional investment is needed from the public and private sectors. The majority of health technology development is led by SMEs who do not possess the same independent funding capabilities as the pharmaceutical industry. Thus the majority of health technology development is dependent on public sector funding, angel investment and venture capital. The Life Sciences Industrial Strategy has been successful in leveraging private sector funding to focus on areas of technology development including biobanking, digital pathology and radiology and digital innovation.

## Recommendations

- To support the further development of health technology test beds to trial technology with a particular focus on child health technology
- To ensure that the cost savings calculated following the implementation of technology include the wider impact e.g. staff time released, work days saved and impact on educational attainment
- To increase funding opportunities for SMEs to develop technologies that are aligned with unmet clinical and patient needs

# Avoiding duplication across multiple agencies in the medtech arena

One of the greatest challenges ahead in the development of systems to support the acceleration of medical technology for the NHS is ensuring that agencies are aligned in their approach and that SMEs understand the role of all the agencies supporting medtech development and adoption. SMEs are challenged with understanding multiple acronyms and the role of organisations with often overlapping roles, making the current landscape confusing and in some circumstances appearing to lack cohesion.

At the meeting on 7th November, it was clear that there were a number of agencies developing similar processes and systems to support industry in the development of medical technology. One of the challenges in emerging areas of health is the duplication of activity and process to achieve results. In reality there are multiple ways in which industry/SMEs can access the NHS support depending on where they are on the innovation pipeline. However, if multiple similar processes exist across different agencies which introduces a level of confusion in an already challenging environment. This in turn introduces the risk that SMEs will look at alternative overseas markets to take their products as the NHS is too challenging to navigate. There was a call for a joined up approach between agencies to streamline the processes to support the medtech industry across the innovation pipeline - in simple terms the creation of a 'roadmap'.

In part, limited communication between healthcare organisations leading on technology development, evaluation and adoption results in overlap, duplication and occasionally confusion. To some extent this is being addressed by the development of the Accelerated Access Review Board. However, other organisations and networks are also working to facilitate technology development and adoption. One suggestion was to divide agencies into two groups - 'Enablers' and 'Translators', and then to recognise the role of each agency within these groupings. Underpinning this is the involvement of patients across the innovation pipeline.

The medtech industry is also calling for signposting to agencies to support collaboration with academics and healthcare professionals, and to understand when and where they can get support. One possible solution to this was to utilise the established NIHR Research Design Service (RDS), already established to support the development of research protocols and groups. Support for the development of technology from the NIHR RDS varies between regions, from being highly developed

and aligned with regional AHSNs, whilst in other places lacking in expertise in the area of medical technology. Thus, with the recent relicensing of NIHR RDS's, there may be an opportunity to provide parity across services in technology development support, by developing technology support sub-groups.

Another area of development that may benefit SMEs is a lit runway of funding opportunities that links in with regional support. Many SMEs have a limited understanding as to how to access research funding, and have limited experience in writing research grants. A means of linking with relevant and willing healthcare professionals may help in supporting access to funds. In additional SMEs should be offered training opportunities as to how to write successful applications to obtain funding in the public sector. The NIHR MedTech and In-Vitro diagnostic Co-operatives can provide SMEs with links to expert clinicians to support technology development. SMEs also need to see how funding fits in with the innovation pathway and understand how to access help and support at each stage of the innovation pathway. Early developmental support is particularly important to ensure that industry do not invest significant sums in prototype or product development that may fail at a later stage - the so-called 'go/no-go' decision.

This and previous consultations have called for a centralisation of processes, although by doing this there needs to be organisational responsibility, and regular checks and updates. SMEs are calling for a centralised system through which they can access and understand unmet needs to align with developing technologies to avoid technology development that is not fit for purpose or duplication of technology. Within this system there not only needs to be a repository of unmet needs, but links to organisations which may be able to provide support. This may include direct access to patient support groups, although this may be better facilitated by healthcare networks and organisations.

A repository of unmet needs may also provide funders with the opportunity to group and align needs to develop funding calls. Inherent within this system may be a process by which artificial intelligence systems learn the topics and needs accessed by SMEs such that funders may align calls with areas of interest to industry. Priority Setting Partnerships (PSPs) could be established to define the greatest area of needs to provide direction for industry.

An online system that could provide SMEs with:

- Information on unmet needs
- Funding opportunities
- Access to advice, professionals
- Links to patients and families
- Information on the current innovation landscape in the NHS

Whilst this may address a number of the current challenges faced by industry partners, significant investment would be required to establish and resource this process.

# Recommendations

- Improve communications between agencies supporting the development and adoption of health technologies in the NHS to avoid duplication and confusion, and to improve efficiency
- Consider rationalising the list of agencies supporting medtech into ‘Enablers’ and ‘Translators’ as part of a rationalised approach to informing industry about organisations and network that support medtech development in the NHS
- Review the medtech capabilities of the NIHR Research Design Service and to develop services to provide medtech advice where these are currently lacking. The aim is to achieve parity of service across each region
- Develop a lit runway of funding opportunities for the medtech sector to access public sector funds
- Develop a system by which relevant clinicians are linked with companies to support technology development and grant writing
- Move towards a more centralised approach to medtech services and support in a similar way to the NIHR Clinical Research Network - could we develop an NIHR Clinical Technology Network (NIHR CTN)?

# Supporting procurement

SMEs have stated that despite clinical support to help them develop their health technology, they struggle with access to procurement advice. Conversely, colleagues in procurement have stated that their involvement in technology development is so late in the process that they are not clear as to the technology need and where it aligns with current service delivery. Thus organisations supporting the development of technology will need to understand the local, regional and national clinical strategic priorities and will also need to consider involving those working in procurement at an earlier stage. At the later stages, AHSNs could be tasked with having a list of local/regional procurement contacts, and guidance as to the requirements for approaching a procurement exercise. AHSNs and other organisations may also be able to help SMEs in undertaking procurement applications based upon a standardised template to increase the chance of success.

Additionally, SMEs that have already gone through the procurement process may be able to offer advice and guidance to other SMEs at an earlier stage. Aligned with procurement is the process of subsequent diffusion of technologies. It remains questionable as to when this process should take place. Some would support diffusion of technology at an earlier stage by means of driving clinical evaluation, whilst other would suggest regional or local procurement followed by diffusion. Whatever the approach it is important that clinical networks are utilised to drive this process. This will ultimately provide widespread patient access to the best and most advanced healthcare whilst introducing the opportunity to SMEs of 'scaling up' the commercial offering. This process may be supported by communication between those working in procurement to advise on successful uptake and implementation of technologies to drive rapid adoption, and thus a move towards a whole systems approach towards specific technologies in the NHS.

Following procurement of technology, assessing acceptance, integration and effectiveness of technology in practice is required to provide evidence of successful implementation. Lessons can be learned where technology has been rejected or has worked well within a clinical system. Thus support is required to evaluate technology implementation and integration post-procurement and publicised widely to increase future success.

# Recommendations

- Provide SMEs with links to clinical networks and clinical research networks to support the diffusion of technologies
- Develop a system by which recently adopted technologies are assessed post-implementation to understand factors contributing to successful adoption and implementation, and to determine barriers to uptake or integration
- Organisations supporting medtech development partnership with SMEs to consider the early inclusion of procurement specialists
- AHSNs and other organisations to develop a standardised national template defining procurement requirements for use by SMEs

# Patient and public engagement in medtech development

The inclusion of patients and families in the development of child health technology is fundamental to ensure that the best and most appropriate technology is developed for children and young people. The TITCH Network and the NIHR Children and Young People MedTech Cooperative adopt the ethos of 'technology for children, designed with children'. In the past devices and equipment have been repurposed from those developed for adult healthcare with often suboptimal results and in some cases leading to complications which may be disfiguring or increasing the risk of ill health. This approach has failed to account for the different anatomy and physiology at different ages in children, and has not considered the versatility in device development to account for growth and pubertal development.

One of the challenges inherent in the involvement of children and young people in the development of devices is connecting those developing devices (usually SMEs) with the relevant patient and family groups.There was a collective view that efforts should be made to build collaborations between SMEs, relevant charities and patient focus groups to identify unmet needs and to ensure the appropriate development of digital and device based technology to ensure patient needs are met as well as addressing clinical need. One of the challenges for SMEs is knowing how to gain access to patients and when to seek this help. Whilst NIHR CYP MedTech and the National TITCH Network can demonstrate success in linking SMEs with patient focus groups including the NIHR Young Persons Advisory Group, there was a collective desire to identify areas where SME/PPI engagement can be supported in the development of technology in other areas. Those involved in facilitating and accelerating the development of technology across healthcare have a responsibility to ensure access to relevant patient groups and forging collaborations with SMEs. Additionally, the identification of unmet needs voiced by patients should be made available in an organised and accessible way to SMEs.

The NHS and the public sector have a number of patient and public groups that have been established to support the improvement and advance in healthcare. In some cases these are generic groups focussed on supporting and facilitating research, with others championing support in specific disease areas. Many of these organisations will understand the needs of the patients and their families, some of which may be amenable to technology solutions but at present do not have clear and centralised process to communicate these needs. At present there is considerable gap between those advocating for patients and the medtech industry.

Bridging this gap may not only improve healthcare but provide solutions for problems

in managing disease that are not immediately obvious to healthcare professionals. One of the proposed solutions to this problem is hosting workshops and hackathons. A hackathon is an innovation design event bringing together those working in technology and design based professions with those focussed on creating and developing technologies in specific ares such as health.

Hackathons can also include patients, their families and charity groups. One of the key challenges in securing the involvement of patients and their families or lay representatives advocating on behalf of patients is the financial support for travel and time. Public sector and commercial organisations wishing to work with PPI representatives need to ensure that appropriate funding is in place to fund their involvement.

## Recommendations

- Charities and established patient and family groups to provide a list or catalogue of unmet needs though an established and centralised channel
- NIHR Specialty Groups to provide access to PPI groups that may provide help and support for technology development
- Established Healthcare Networks and Organisations to identify unmet needs from established PPI groups and for a process to be established to to store and provide access to these unmet needs.
- Established Healthcare Networks and Organisations supporting technology development to ring fence funding for PPI activities and to ensure that funding applications embed PPI involvement.
- NHS and allied organisations supporting health technology development to create platforms designed to broker relationships between industry and patients/families

# Summary

The rapid growth of the medtech sector paralleled with the need to improve the healthcare of children and adults provides an invaluable opportunity to deliver sustainable change within the NHS. In particular, the growth of the National TITCH (Technology Innovation Transforming Child Health) Network, the introduction of the NIHR Children & Young People MedTech Cooperative and the experience of the NIHR Children's Specialty has the potential to position the UK as a world leader in the field of child health technology; advancing healthcare in childhood could mean advancing health and healthcare for life. Improved communication between the medtech community and healthcare professionals and organisations will provide a much needed platform to facilitate this.

Fundamentally, SME's and larger private sector organisations require a joined up approach between organisations working within and supporting the NHS to provide a lit runway for access to patients, families and clinicians and importantly to funding. Collaborative working between organisations supporting the development and adoption of medical technology for the NHS will provide a much needed approach to ensure the identification and prioritisation of unmet needs, will prevent duplication across healthcare organisations and will support a more seamless approach to accelerating the implementation of technology. However, this needs to be matched with the involvement of patients, families and service providers to ensure that technology can be appropriately integrated into health services, and that technology is accepted by those using it. Furthermore, the early inclusion of NHS procurement leads and health economic expertise will ensure that the rapid development of technology is matched by rapid uptake and commercial viability. The NIHR Clinical Research Network has successfully integrated and aligned infrastructure to delver high quality clinical research at a regional and national level. However, there is a current tension that technology development and evaluation with the current research infrastructure does not fit well. In the same way that the NIHR Clinical Research Network exists, an allied network or subnetwork could be created from current infrastructure tasked with supporting technology development at a national level - an NIHR 'Clinical Technology Network'.

Whilst many private sector organisations have harnessed and developed significant technology capabilities, the lack of access to and understanding of unmet needs makes it difficult for SMEs to apply these technologies to improve health. A move to a more centralised approach to identifying and prioritising unmet needs and linking industry with organisations in a position to support technology development is crucial to ensuring the greatest benefit, uptake and impact of health technology. Moreover, a clearer understanding of new technology capabilities may drive clinicians to consider new applications for cutting edge technologies.

Ideally a networked approach to technology development in a co-ordinated system akin to the NHR Clinical Research Network could ensure a more streamlined operational approach to the development of technology in the NHS whilst providing centralised access to industry. Moreover, as technology becomes increasingly integrated into the NHS to support the management and delivery of healthcare, it is vital that we have a technology ready workforce that has the ability to identify unmet needs amenable to technology solutions, who are capable of working with industry and other academic professionals to work collaboratively to develop new technologies. Ultimately industry, the NHS, patents and families have reached an exciting interface by which technology can revolutionise healthcare. By working in partnership, preparing the workforce, introducing health care technology early in life and centralising processes, we have the opportunity to make the NHS the most advanced healthcare system in the world.

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## From industry to patients

**Summary of the meeting and workshops held on 7th November 2017 hosted by the NIHR CRN:Children and TITCH**