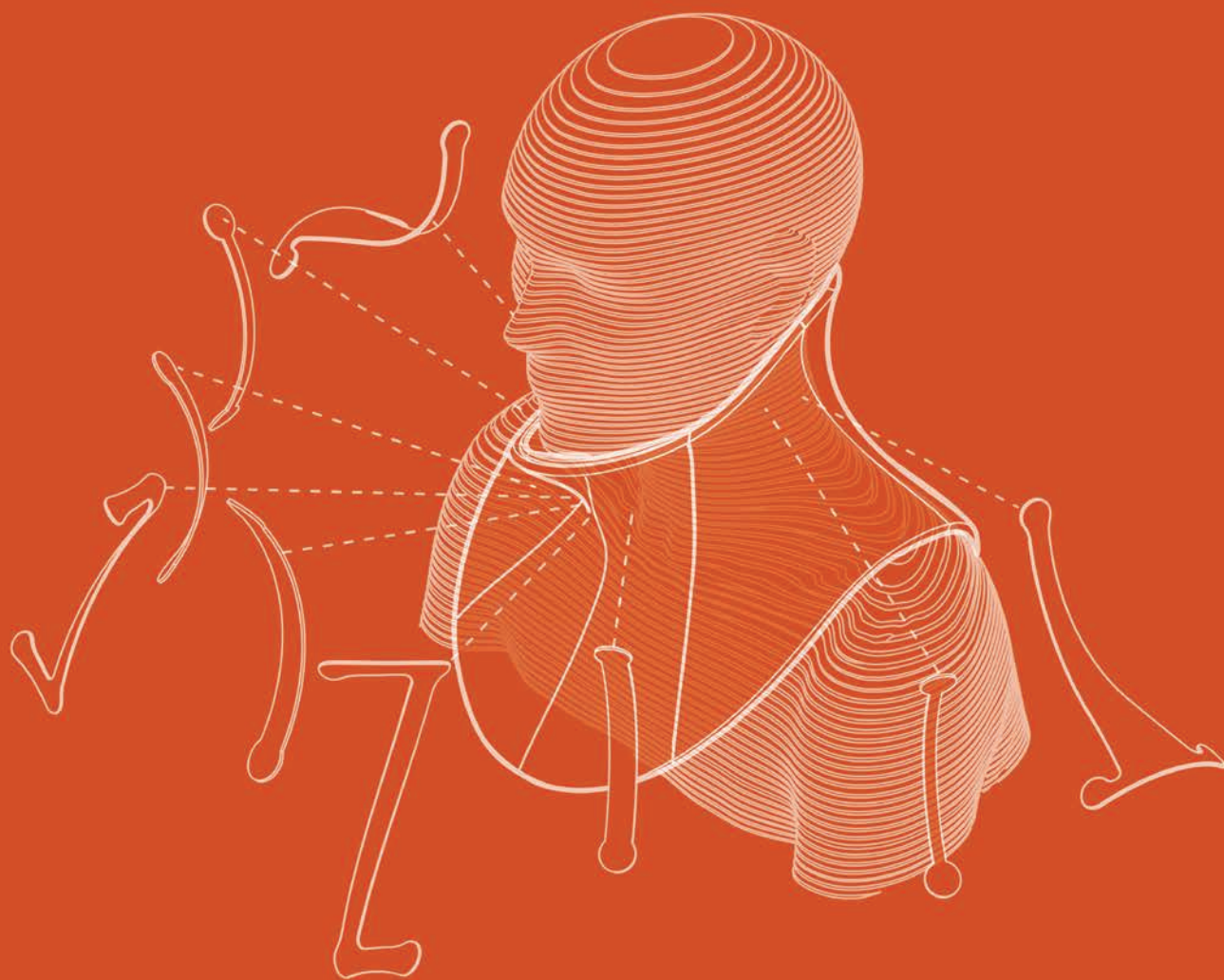


Devices for Dignity
Healthcare Technology
Co-operative

NHS
*National Institute for
Health Research*



Annual Report 2015/16

Improving outcomes and quality of life for people of all ages
with long-term health conditions

Our Partners

NHS Partners

Sheffield Teaching Hospitals NHS Foundation Trust
Barnsley Hospital NHS Foundation Trust
North Bristol NHS Trust
The Leeds Teaching Hospitals NHS Trust
Sheffield Children's NHS Foundation Trust
The Newcastle upon Tyne Hospitals NHS Foundation Trust
Central Manchester University Hospitals NHS Foundation Trust

Partners in the Technology Innovation Transforming Child Health (TITCH) Network

Sheffield Children's NHS Foundation Trust
Great Ormond Street Hospital for Children NHS Trust
Birmingham Children's Hospital NHS Foundation Trust
Guy's and St Thomas' NHS Foundation Trust
University Hospitals of Leicester NHS Trust
Central Manchester University Hospital NHS Foundation Trust
Alder Hey Children's NHS Foundation Trust
Yorkshire Ambulance Service NHS Trust
Sheffield Hallam University
Medilink
mHabitat
Trustech

Charity Partner

Bladder and Bowel Foundation



University Partners

The University of Sheffield
Sheffield Hallam University
University of Cambridge
Coventry University



D4D's extended national networks include 28 NHS Trusts, 21 Universities, 160 Businesses and 35 Charities. Our networks are constantly growing.

Front cover: The Sheffield Support Snood has been developed by a collaboration between D4D, the Sheffield Institute for Translational Neuroscience (SiTraN) at the University of Sheffield, Sheffield Hallam University, Sheffield Teaching Hospitals, Barnsley Hospital and the Motor Neurone Disease Association. Its purpose is to help people with neck muscle weakness. We have produced 150 collars for a clinical trial with people with MND or other forms of neck muscle weakness, and are currently recruiting participants from across the UK. Prior to the trial we had been contacted by more than 100 patients who are interested in obtaining our neck collar. Many thanks to all involved for all the support this project has received so far.

Contents

An overview of 2015/16	2
How are we performing?	3
Why is it so important to consider dignity during technology development?	4
Case study - Emego, a switch to bring greater independence to people with profound disability	5
D4D's process	6
Access to a wide range of expertise	7
Working with healthcare professionals and services	8
Case study - Working with Quanta Dialysis Technologies to develop next generation technologies in renal care	9
Working with patients and carers	10
Case study - Designing technologies to meet the individual needs of children with long-term conditions	11
Working with businesses	12
Case study - Providing strategic and practical guidance to small companies developing health products	13
Working with academics and researchers	14
The D4D team	16
Our publications 2015/16	17

An overview of 2015/16

Clinical Director's comments

When Devices for Dignity was founded eight years ago we could not have predicted that it would grow and deliver in the ways that it has. Although Devices for Dignity's (D4D's) overall remit - of developing medical technologies that promote dignity and independence - has remained constant, its capacity and capability to deliver has grown significantly.

One of D4D's long-term objectives is to demonstrate strategic alignment with national health initiatives. We are delivering on this, and in addition, our wider expertise in the development of new technologies for healthcare is influencing national initiatives, for example through consulting on future funding calls and advising and commenting on policy direction and strategic planning.

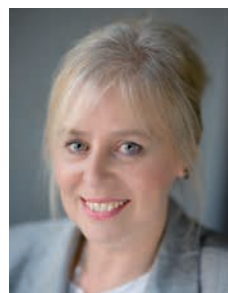
We have demonstrated the strength of our underpinning methodologies through our ability to successfully support new areas such as digital healthcare and paediatric technologies, as evidenced through our involvement in the Yorkshire and Humber Academic Health Science Network Proof of Concept initiative (see our Aldacorp case study on page 13), and the growth and popularity of our Paediatric Technologies theme. This maturity is an important part of future proofing D4D such that we stay in a position to respond to opportunities for science and technology to address key challenges in developing and delivering a better healthcare service.

We continue to ensure that Patient and Public Involvement (PPI) is central to our approach. June 2015 saw My Dignity Means: A Patient-led Event, a ground-breaking priority-setting opportunity for patients, carers and the public, and which continues to provide direction to our activities; you can read more about this on page 10. In response to patient and public feedback, and demonstrating our ongoing commitment to PPI, we have appointed a dedicated Patient Partnership Lead to ensure our whole programme, including all projects and applications, can benefit from more detailed PPI oversight and direction.

Working in partnership with industry remains key to our success. We are delighted that one of our long-standing partners, Quanta, is piloting a compact haemodialysis system, SC+, in dialysis centres across the UK (see page 9). We also continue to work with industry partners who bring independently developed devices to areas of patient need, as these have the potential to bring valuable innovation into the NHS and into the hands of patients and other users.

On a personal level, in March 2016 I was honoured to be named as Healthcare Scientist of the Year. I am both delighted and humbled to receive this award. I have been fortunate over the years to have worked with many great teams of healthcare scientists and other professionals; this award reflects everyone's hard work, and extends to D4D and those within D4D's networks.

Finally, on behalf of D4D I would like to thank our funders, partner organisations, and teams of collaborators for their ongoing involvement and support in enabling us to continue to develop new healthcare technologies that improve dignity and independence for their users.



Professor Wendy Tindale OBE
Clinical Director, NIHR Devices for Dignity HTC
Consultant Clinical Scientist
Scientific Director,
Sheffield Teaching Hospitals
NHS Foundation Trust
Healthcare Scientist of the Year 2016

How are we performing?

During 2015/16:

We worked on **51** projects

We received **69** enquiries
for new product development

We started **14** new projects

We had a **56%** grant success rate

We leveraged **£11,424,947**
of additional funding to support our
pipeline of technology projects



5 clinical trials underway



27 publications released



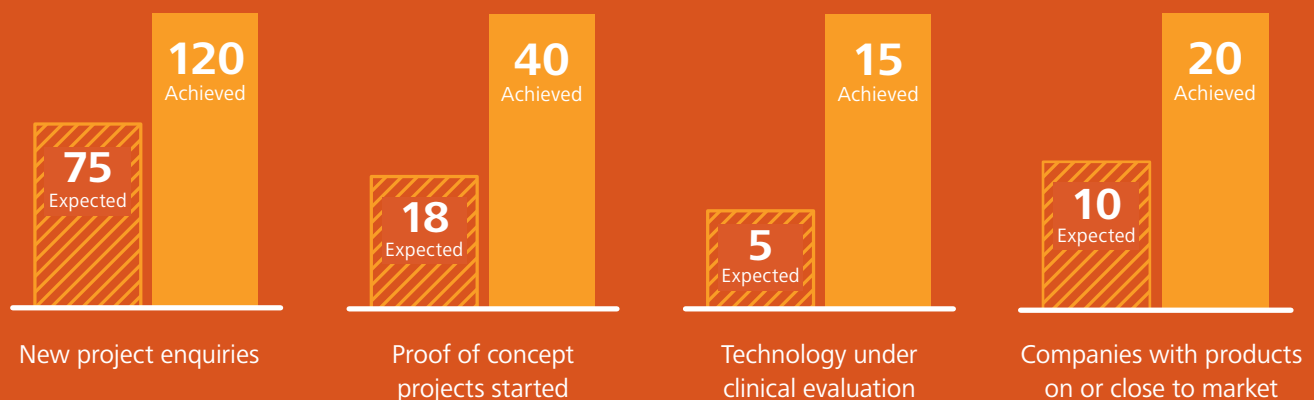
51 conference presentations
delivered



16 newsletters distributed

Are we meeting our targets?

D4D originally began in 2008, and our current NIHR
funding started in 2013. In the last three years:



Why is it so important to consider dignity during technology development?

The development of technology to assist or simplify medical diagnoses, treatment and management can provide the opportunity to greatly improve patient experiences and medical outcomes. However, addressing only the patient's clinical needs in isolation misses the opportunity to achieve genuinely effective solutions. For patients, their ability to live with dignity can have a big impact on their health and happiness. Truly effective and enduring technologies should therefore be developed with users, and should consider how, where and when they will use the technology; if a user dislikes using a technology, they are less likely to use it. An example of a technology that D4D is developing in partnership with patients is the Sheffield Support Snood (orthotic collar) for people with neck muscle weakness, as depicted on the front cover. The collar has been designed to be more wearable and adaptable than other support collars, and is currently undergoing a clinical evaluation.

By developing technologies around users' wider needs rather than just patients' clinical needs, and by taking

into account the needs of everyone involved in a project from early stages, projects can be designed well, and all partners can benefit.

For this reason D4D works closely with and values the involvement of patients and carers, clinicians, researchers, designers, charities and industry partners when developing technology solutions. By building such partnerships we can ensure that the solutions that we develop maintain or promote people's dignity - and by extension their wellbeing - at the same time as addressing their clinical needs.

"Other, more rigid collars were painful. I couldn't wear them for too long. I can wear this collar for 8 hours straight... I wear it at work." - Patient participant comment in clinical study of new collar design

"This collar gives support but also more freedom of movement... I can wear it to drive." - Patient participant comment in the clinical study of the new collar design

Patients can experience fewer disruptions and exert greater control over their lives, which is likely to lead to greater satisfaction and adherence to their treatment, and better wellbeing.



Healthcare professionals are also users of technologies with their patients, so clinical input into device design can help ensure that technology adoption challenges are anticipated early in the development process and can be addressed in the context of existing practices, training and systems.



Technology companies can develop solutions that are likely to be better received by the patients and clinicians using them.



The resulting well-designed technologies are more beneficial to patients and users, so may benefit from patient- and clinical 'pull', which helps ensure the solution is widely sought, can help drive faster widespread adoption, and helps the company to establish itself more effectively within the health marketplace.

Case study

Emego, a switch to bring greater independence to people with profound disability caused by significantly reduced muscle control

Through our Assistive and Rehabilitative Technologies theme, D4D appreciates the need to give people with very limited movement both improved communication and control of their environment. One way to address this was to sense the small electrical signals from muscles (EMG) over which the patients still had control. Our network became aware of a new kind of EMG sensor that would eliminate the main limitations of traditional EMG sensing, making the switch work more reliably. D4D then worked closely to support GSPK Design in making a successful proposal for development funding to a Small Business Research Initiative (SBRI) scheme.

This funding allowed GSPK Design to work closely with the D4D team, including colleagues at Barnsley Hospital, The University of Sheffield and Sheffield Teaching Hospitals. Each partner brought their own set of complementary skills - from clinical insight and understanding of patient needs to electronic design and manufacturing, medical device regulatory expertise and an understanding of international marketing. Together, this team worked to produce and test a successful demonstrator system in six months, and which produced results that were even better than anticipated.

Following the successful first phase, the team was awarded a second phase of development funding for the EMG switch, named Emego. This phase will allow the co-development with users of a final specification for the production version of the device, and its design and clinical testing. We are now confident that a new product can be used by people within the next 12 months, giving them an opportunity to regain control over their lives. This includes a plan for making the device commercially available to users internationally as well as in the UK.

The project is currently in development and verification stages, leading to clinical trials and production versions of a CE marked version of Emego planned for Quarter 3 in 2016/17. Supported by D4D's regulatory expertise, GSPK Design has successfully implemented the medical device regulatory systems (ISO 13485) as part of their existing Quality Management System, and are now actively looking for additional opportunities in the medical device space.



D4D's process:

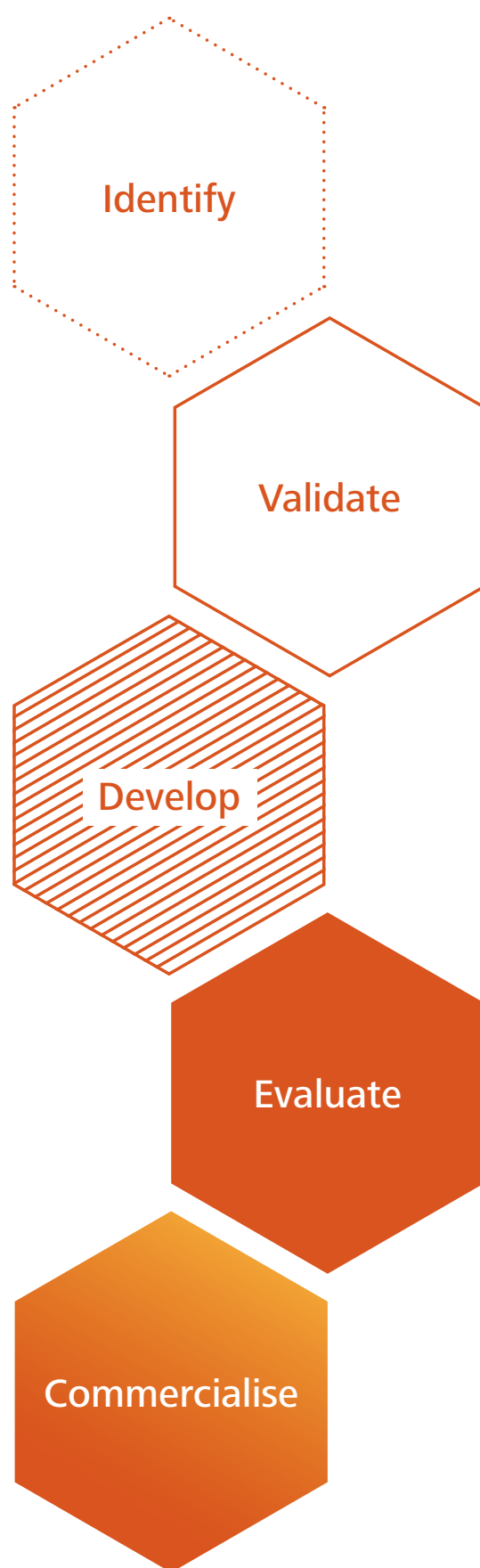
Identify, validate, develop, evaluate and commercialise

D4D has developed an adaptable approach to addressing unmet clinical needs. After a clinical need has been **identified**, we use our networks of patients and experts to independently refine and **validate** the need. Once we know exactly what the problem is, and that it has a high clinical priority, we can start exploring creative conceptual approaches to addressing the problem, before moving towards producing and refining prototypes. This approach ensures that valuable time and resource are not wasted in developing technologies that are ultimately unlikely to reach the clinic or marketplace.

Having **developed** prototypes, we then **evaluate** how they can work in clinical practice and as part of people's daily lives. This helps us to obtain the evidence that we need in order to achieve the vital CE mark, and to provide the information needed by clinical departments and NHS purchasers to enable the device to be used in clinical practice.

When we initiate a project, we work closely with people with experience in industry to ensure that the needs of manufacturers and distributors can be anticipated, such that once we have obtained a CE mark, the device can be **licensed, produced, and supplied**.

We also work directly with companies that approach us with their own project concepts and devices; you can read more about the ways in which we can do this on page 12.



Access to a wide range of expertise

D4D has a healthcare technology network that enables us to rapidly seek opinions from across the NHS nationally. In addition, we have established networks of patients, carers, academics, charities, designers and engineers, who all provide knowledge and skills to our projects.

Our Themes

We undertake a wide range of projects associated with technology, dignity and independence, predominantly though not exclusively linked to the following themes:

- Renal Technologies
- Paediatric Technologies (including the TITCH network - Technology Innovation Transforming Child Health)
- Urinary Continence Management
- Assistive and Rehabilitative Technologies

As well as the networks we have established, we are partners in three Partnership Awards jointly funded by the Engineering and Physical Sciences Research Council (EPSRC) and the NIHR. These networks were funded specifically to capitalise on the expertise of our clinical and academic communities, and establish closer links with industry, in order to better address healthcare issues.

EPSRC-NIHR HTC Partnerships

IMPRESS:

Incontinence Management and Prevention through Engineering and Sciences

MDVS:

Medical Devices and Vulnerable Skin; Optimising Safety in Design

PRIDE:

Promoting Real Independence through Design Expertise

IMPRESS and MDVS have been awarded additional Network Plus funding that started in July 2016 to continue their valuable work. We will also be partners in another Network Plus focussing on Devices for Surgery and Rehabilitation.

We have generated new patient-driven challenges and raised the profile of paediatric technology needs by running workshops within our Paediatric Technologies theme, including the TITCH network. These workshops have demonstrated significant demand and generated major success in securing external Small Business Research Initiative (SBRI) Healthcare funding, and a Central Manchester University Hospitals NHS FT and Greater Manchester Academic Health Science Network (GM AHSN) Proof of Concept competition, 'Pitch to Titch'.



Paediatric Non-Invasive Ventilation project

For children and adults with nocturnal hypoventilation, breathing support via non-invasive ventilation is essential to prevent chronic hypoxia and significantly shortened lifespan. The very young, and children and adults with facial asymmetry, can experience poorly fitting face masks, which compromises their therapy.

D4D are partners in an NIHR Invention for Innovation (i4i) project to improve non-invasive ventilation masks for paediatric use. The project began in October 2015.

We have identified
over 100 unmet needs
in child health.

Working with healthcare professionals and services

“

When asked what would make a difference for them and their patients, one of the things that GPs, care home carers and nurses often mention is that they'd like to be able to accurately diagnose urinary tract infections at the point of care, and give the right treatments right away, rather than treat with broad spectrum antibiotics, send away a sample and wait for the lab results, before potentially changing to a more appropriate treatment. We are responding to this need by working on a device that we hope will help with this situation.”

- Dr Nicola Morris, Bristol Urological Institute, collaborating with D4D

We don't just receive enquiries about unmet needs from patients; we are often contacted by healthcare professionals who are caring for patients, such as doctors, clinical scientists, nurses, physiotherapists, and professional carers. Healthcare staff sometimes contact us on behalf of patients, and sometimes contact us because they have identified a need for themselves, as they are also users of technologies as part of their clinical practice.

Our projects are based within or tightly linked to health services, whether in the community with GPs, in hospitals, or in people's homes. For a healthcare technology to be successful it is vital that its development takes place within the context of the complex existing clinical and administrative practices and services, data systems, management and purchasing routes. For this reason our projects routinely involve or are led by staff working across many health and care delivery specialities.

Swallowing after stroke - Ampcare Effective Swallowing Protocol (ESP)

D4D were involved in a successful pilot study with speech and language therapists at Sheffield Teaching Hospitals NHS FT demonstrating how electrical stimulation of the supra-laryngeal muscles can assist swallow function in patients with post-stroke dysphagia. As a result of this work the Ampcare ESP product will launch in the UK in 2016.



Case study

Working with Quanta Dialysis Technologies to develop next generation technologies in renal care

D4D has worked with Quanta to enable the company to develop SC+, a high performance, compact, easy-to-use haemodialysis system. SC+ will enable more patients to transition to self-care or home dialysis, both of which have the potential to improve wellbeing and reduce both direct and long-term treatment costs.

People diagnosed with end stage renal disease require dialysis to keep them alive. However, treatment can also have an adverse impact on quality of life. Visits to a dialysis centre typically take about four hours plus travel time, three times a week. People who require regular haemodialysis are heavily constrained and are forced to live their lives around their dialysis sessions, which has implications for their ability to work, go on holiday, or take part in normal day-to-day activities.

Dialysis also places a huge burden on the healthcare system, costing the NHS over £505 million each year. It is one of the largest global healthcare markets worth approximately \$73 billion per annum, with staffing/nursing costs making up around 60 per cent of the total direct cost of dialysis treatments in the UK, and patient numbers are still growing. The alternative is home haemodialysis, which has been shown to lead to improved quality of life and survival rates. However, uptake remains low, partly due to limitations with existing haemodialysis systems.

Through the D4D partnership, Quanta was able to work closely with clinicians and patients during the development of SC+. The technology behind SC+ is based on an innovative and unique design that incorporates the accurate fluid management required for dialysis into a single-use disposable cartridge. This cartridge-based design approach is intended to reduce downtime between treatments, simplify treatment complexity and reduce the risk of contamination. SC+ provides clinical efficacy comparable to conventional devices and is compatible with traditional treatment regimens used in-centre.

SC+ is CE marked and Quanta is currently piloting SC+ at a number of NHS dialysis centres across the UK.

In order to make an impact, innovation must provide tangible advantages to users while also being affordable for a healthcare system. SC+ is compact and easy to use. In the clinic, it will require less supervision, freeing up the time of nurses. When used by patients at home, it is expected to reduce the cost to the NHS. Dialysis patients often require more than just haemodialysis treatment; for example, they also need transport, care and medication. By allowing patients to dialyse more frequently in self-care units or at home, SC+ can improve outcomes and reduce hospital visits, which will ultimately reduce costs.



Investment: SC+ was designed and developed by Quanta with investment from the NIHR, NBGI Ventures, Wellington Partners, Seroba, b-to-v Partners, ALIAD, Seventure Partners, Kuwait Life Sciences Company and IMI plc. A total of £45 million has been raised to develop SC+ through regulatory approval and launch.

Working with patients and carers



Health conditions can have an extensive impact on how a person is able to live, and it can be difficult to imagine the extent of the effects without direct experience of them. Patient need is the driving force behind our projects, and as such, it is vital that we understand from patients what their experiences are, and how they would like them improved.

How do we ensure patients are partners in our projects?

We include individuals or groups of patients and carers, or patient-representing organisations such as charities, in the following:

- Discussions and focus groups
- Design workshops
- Iterative design and evaluation
- Project teams
- Contributing to- and being applicants in-grant submissions
- Reviewing grant submissions
- Membership of our Steering Committee and Project Advisory Panels
- Identification of outcome measures that are important to patients and their carers for inclusion in trials
- Concept and prototype reviews

During 2015/16 we appointed a Patient Partnership Lead to ensure that we constantly strive to maintain or further improve the Public and Patient Involvement (PPI) standards across our entire portfolio of projects. Additionally, we are always keen to hear from members of the public who might be interested in becoming part of our Expert Network, or becoming project partners.

"I then see that my experiences and thoughts seem to go on and provide fodder for the designs, which is extremely gratifying." - Patient participant commenting on experience of direct involvement in a product concept design event

My Dignity Means

In early 2015 we launched a social media campaign, #MyDignityMeans, and a survey. The survey invited responders to let us know what aspects of their lives were affected by their conditions, and how they would like their existing devices improved. By May 2015 we had received over 650 responses. We looked for themes that were common to people from across a wide spectrum of conditions, and took those themes forwards for further discussion in June 2015 at our patient-led event, also called My Dignity Means.

On the day of the event we had some fantastic lively discussions, and some tears, with around 100 attendees taking part across a range of sessions designed to identify what patients want, and to help prioritise the projects that we undertake. Attendees at the event were able to help us identify further areas for exploration, and added additional patient insight into existing projects. You can read about the event and outcomes in greater detail in the event report 'My Dignity Means: Patient Voices', available on our website.

"...devices [should] be designed with patients' broader needs in mind, not just their clinical needs. If a healthcare solution does not work within the full context of a patient's life, it is not a complete solution." - My Dignity Means: Patient Voices event report

Many thanks to all survey responders, event attendees, supporters and sponsors for their insights and help in bringing this event together.

365 Response - improving experiences for renal patients

D4D has supported the development of this phone-based booking app used for patient transport, which aims to put patients in control of their journeys. Demand for a solution in NHS patient transport for dialysis was a top listed unmet need by kidney patients. This technology, the first of its kind, transforms patient transport in dialysis care by improving patient experience of NHS transport, improving patient flow, and enabling the clinical benefits of optimal dialysis. The technology is being trialled in two regions during 2015/16, with further plans for 2016/17.

Case study

Designing technologies to meet the individual needs of children with long-term conditions

The TITCH network Schools Project, led by Sheffield Hallam University, introduced local children with long-term conditions to 'A' level design students for a partnership lasting a whole academic year. Students were tasked with working closely with individual children and their families to design a bespoke device that would aid their day-to-day living. Students were provided with ongoing guidance, workshops and facilities by designers at Sheffield Hallam University, and were supported in their projects by D4D and Sheffield Children's Hospital, with insight into the MedTech industry provided by businesses who are members of the Local Enterprise Partnership (LEP). The idea was that by teaming young people with long-term conditions with young technology designers, users would engage more effectively with the resulting technologies and devices as they will have been designed with contemporary empathy and a tacit understanding of the motivations, desires, and activities that are likely to be important to the user.

The children, families and students worked together to establish which aspects of everyday life the children and families like, or that frustrate or annoy them, or that they wished they could do more of or have less of. This enabled the groups to identify 'problem statements' that the students could work on with the families to develop ideas and solutions.

Feedback from the families involved in projects was good. Two of the students have been offered support by an industry innovation professional to develop their projects further or into businesses, and are taking gap years to do so. For one of the students, the family is keen to have the device that was designed, and are also keen to be involved in taking it forwards so that it can be developed as a product that is available to all children with type 1 diabetes, and potentially adults.



Local Enterprise Partnership (LEP)

The LEP involves the private and public sectors working together to ensure the growth of a balanced local economy. Member organisations of the LEP involved in the Schools project included medical technology companies JRI Orthotics, Kingkraft, Fripp Design and Research, and Sheffield Precision Medical.

Working with businesses



D4D's understanding of the NHS landscape and the regulatory requirements of medical devices has been extremely beneficial and invaluable in the early stages of the development process. Their vast network has opened up a number of opportunities and enabled us to improve our chances of product adoption and success, without which we probably would still be fumbling in the dark." - *GSPK Design*

Working with industry has always been at the core of the HTC's concept - businesses are a vital part of ensuring that patients can receive the full benefits of technologies.

When we initiate projects ourselves, we seek advice from industry experts from early stages to ensure that manufacturing, licensing and supply chain needs can be properly considered as the project develops. When external funding is obtained to further a project, industry partners' costs are covered where appropriate, just like any clinical, patient, charity, research or design partners.

D4D is also uniquely positioned to provide valuable knowledge and facilitation to Industry-led projects and proposals. We are able to apply our knowledge and access our expert network of clinicians and patients for projects that are under development or already underway, or to support further product development. Where Industry proposals are found by our expert network to be strongly aligned with areas of the highest clinical priority with strong and demonstrable patient pull, we may provide aspects of our expertise on a pro bono basis, though all services are also available at consultancy rates to industry organisations where our expert networks believe they effectively address a real patient need.

We aim to make our broad expertise and experience available to companies both through collaborative projects and direct service contracts. We can offer the following opportunities, each tailored to organisations' particular needs:

- Access to clinical expertise
- Access to patient opinions
- Concept validation
- Regulatory guidance
- Strategy development
- Support with grant applications
- Clinical evidence planning
- Signposting within the NHS
- Market analysis

We encourage businesses to contact us to discuss their project's needs.

D4D worked with 93 businesses during 2015/16, predominantly from the devices sector. Other sectors included non-life sciences, and companies entering the digital health business, where D4D sees a particular role in supporting new entrants to the healthcare sector.

Case study

Providing strategic and practical guidance to small companies developing health products

During 2015/16 D4D collaborated with the Yorkshire and Humber Academic Health Science Network (YH AHSN) in a competition for small and medium-sized enterprises (SMEs) hoping to have a significant positive impact on health and social care within the region. Companies submitted their product and service concepts, with successful entrants winning bespoke support from D4D, Medipex and Medilink in validating their designs, planning their concept's further development, and addressing the specific challenges.

Four companies were successful in winning our support for their innovative ideas during this competition. One of those, Aldacorp, is developing DocAbode, a new system to address the crisis

in emergency care by enabling emergency care providers to access the existing GP workforce through a system that can refer out-of-hours health calls to registered GPs at periods of high demand. This could reduce patient visit delays, and have knock-on benefits by reducing demand on mainstream emergency services. D4D has been working closely with Aldacorp to understand the response of the relevant GP community and model the potential impact of the new approach.

The initial findings of D4D's work with DocAbode indicates a high level of interest from GPs, which provides confidence to providers interested in implementing the new system.



Working with academics and researchers

D4D are based within the NHS with close links to academia, and are able to use our network of experts to access the clinical and academic expertise that translational health research projects need. We offer guidance through the NHS' complex systems, and provide a wealth of valuable innovation expertise directly from our Core Team. During 2015/16 we leveraged funding of £11.4M, and were partners in successfully funded applications for the following research led by academic institutions:

Professor Paul Brenchley
University of Manchester/Central
Manchester University Hospitals

Awarded £543,447 by the NIHR Invention for Innovation (i4i) Programme

Developing Phospho-Lipase Antigen Receptor ImmunoAdsorption (PLARIA) therapy for patients with anti-PLA2R positive membranous nephropathy
June 2016 - May 2018

Membranous nephropathy (MN) is a rare kidney disease mainly affecting adults in middle age. In the UK about 800 new cases are diagnosed each year. Treatment is only effective at inducing a complete remission in about 30% of cases. Up to a third of patients will lose their kidney function and require dialysis or transplantation. This project proposes an alternative breakthrough immunoabsorption therapy using a column that filters the blood. The column and therapy will be specific to MN in individuals who are positive for the anti-PLA2R antibody, which is linked to kidney damage. The aim of the treatment is to prevent loss of kidney function in acute MN, or preserve residual kidney function in relapsing MN patients.

During 2015/16:

We worked on **51** projects

We were authors on **27** peer-reviewed publications

You can find our publications listed on page 17.

Dr Janice Murray
Manchester Metropolitan University

Awarded £827,258 by the NIHR Health Services and Delivery Research (HSDR) Programme

Identifying appropriate symbol communication aids for children who are non-speaking: enhancing clinical decision making

September 2015 - August 2018

Children who need to use symbolic communication aids are the most challenging population accessing specialised communication aid services. Currently there is a lack of understanding of the most valuable aspects of clinical expertise and a poor understanding of child and family values within the clinical decision process. Without research evidence to reinforce clinical expertise there is no means of determining the actual quality of provision. The overall aim of this project is to improve the outcomes for children with little or no intelligible speech, who need symbol communication aids to communicate. The specific aim is to influence current practice to improve the consistency and quality of clinical decision making in the provision of symbol communication aids.

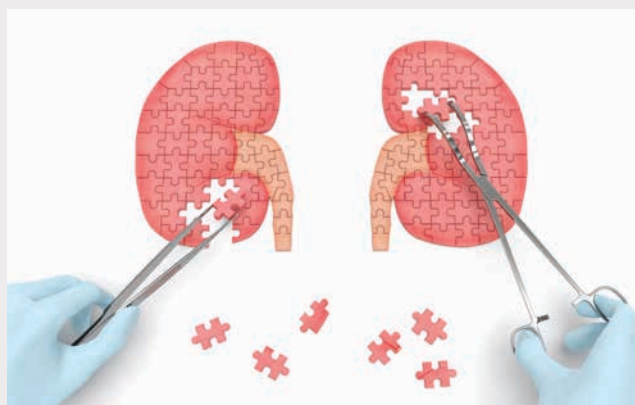
Professor Simon Davies, Keele University

Awarded £1,288,508 by the NIHR Health Technology Assessment (HTA) Programme

BioImpedance Spectroscopy To maintain Renal Output - the BISTRO trial

April 2016 - May 2019

This project will work with patients from 30 dialysis units to generate clinical evidence around the regular use of bioimpedance, which gives information about fluid status, in improving outcomes for people who have recently started haemodialysis for kidney failure. It is important to be able to accurately assess the fluid status of individuals; leaving patients chronically overloaded with fluid leaves them at a greater risk of cardiovascular complications while removing too much fluid can lead to hypotension, cramps, nausea and loss of residual renal function. The aim of this project is to see whether this intervention helps maintain residual kidney function, as this is associated with improved survival, fewer symptoms of kidney failure, fewer side effects of dialysis treatment, and a better quality of life. The research will also explore whether sharing the bioimpedance information with patients leads to greater involvement and participation in their treatment.



Dr Peter Culmer, University of Leeds

Awarded £504,951 by the EPSRC-NIHR HTC Partnership Award Plus

Incontinence Management and Prevention through Engineering and Sciences (IMPRESS) 2

July 2016 - June 2018

This network has been designed to maximise and extend the impact of the current IMPRESS network by applying engineering sciences to deliver novel solutions to the many challenges that exist in the management and treatment of incontinence.

Professor Guang-Zhong Yang Imperial College London

Awarded £507,552 by the EPSRC-NIHR HTC Partnership Award Plus

Technology Network-Plus on Devices for Surgery and Rehabilitation

September 2016 - September 2019

This network aims to establish a forum for surgical innovation that seamlessly integrates engineering research, clinical translation and industrial development. The purpose of the network is to accelerate the development and clinical adoption of new surgical and assistive devices that can improve the treatment, functional restoration, rehabilitation and quality of life for patients.

Professor Dan Bader University of Southampton

Awarded £502,895 by the EPSRC-NIHR HTC Partnership Award Plus

Medical Devices and Vulnerable Skin Network Plus (MDVSNplus): Intelligent sensing to promote self-management

July 2016 - June 2019

MDVSNplus will integrate research expertise and motivate clinicians and industrialists to provide intelligent strategies to maintain medical device longevity and patient comfort in a range of clinical settings. It brings together leaders in the fields of sensing, imaging and computer simulation to provide the necessary expertise to evaluate the impact of new and existing medical devices which attach to vulnerable skin. The Network aims to use these capabilities to develop a series of intelligent mechanisms, for example sensors, which can monitor the functionality and safety of devices over time. The network will also target methods of detecting when a device is causing harm to vulnerable skin and create an early warning system for patients and carers.

The D4D team

Core Team



Professor Wendy Tindale
Clinical Director



Dr Nicola Heron
Programme Director



David Coyle
Patient Partnership Lead
SBRI Project Manager



Dr Katherine Jeays-Ward
Communications Lead
Project Manager



Dr Angel Jimenez-Aranda
Technology Development
Manager



Kirsty Kassim
Programme Administrator



Dr Avril McCarthy
Medical Technologies Lead



Liz Pryde
Project Manager

Devices for Dignity Ltd



Oliver Wells
Commercial Director



Dr Hajar Razaghi
Resource Manager

Assistive and Rehabilitative Technologies



Professor Mark Hawley
Theme Lead



Professor Rory O'Connor
Theme Lead



Professor Sue Pownall
Clinical Advisor



Simon Judge
Theme Research Associate



Lise Sproson
Theme Research Associate

Paediatric Technologies



Professor Paul Dimitri
Theme Lead



Dr Joseph Langley
Engineering Design
Research Fellow



Nathaniel Mills
Project Manager

Renal Technologies



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Our publications 2015/16

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About Healthcare Technology Co-operatives

Devices for Dignity is one of eight national Healthcare Technology Co-operatives (HTCs). We are funded by the National Institute for Health Research (NIHR) to act as a catalyst within the NHS for the development of new medical devices, healthcare technologies and technology-dependent interventions. We focus on developing technology solutions to meet clinical needs and for chronic health conditions that are often overlooked and that are typically associated with loss of dignity and independence, and poor patient outcomes.

People with long-term conditions often experience a range of complex issues, for example incontinence, mental health conditions, reliance on regular hospital-based therapies, communication difficulties, or difficulties with independently performing activities of daily living. While many current treatments and technologies in these areas provide a vital clinical function, many don't take into account how the patient uses the technology in the full context of their day-to-day life. If a patient dislikes using a treatment or technology - whether because it is time consuming, heavy, noisy, unaffordable, invasive, unattractive, or fits poorly - they are less likely to do so. D4D therefore works closely with patients, carers and all other parties involved in product development to ensure the technologies we develop fit into the lives of the people that they're designed for.

"Since 2008 we have been working collaboratively with patients, carers, clinicians, industry, charities, designers and engineers to develop and introduce technologies that improve treatment and quality of life for patients. We're driven by patient and clinical need, and work within existing healthcare and manufacturing systems to ensure we have the greatest impact possible."

- Dr Nicola Heron, Programme Director

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