Devices for Dignity

Healthcare Technology Co-operative

Providing dignity and independence - linking, listening and learning through the pilot years

2008 to 2013

D4D

Thank you...

We would like to thank our partners and collaborators, because without them, the success of Devices for Dignity would not have been possible.

Devices for Dignity Pilot HTC partners

NHS
National Institute for Health Research

The University Of Sheffield.

Sheffield Teaching Hospitals
NHS Foundation Trust

UNIVERSITY OF CAMBRIDGE

Barnsley Hospital
NHS Foundation Trust

Coventry University

The Leeds Teaching Hospitals
NHS Trust

ASSISTUK

North Bristol
NHS Trust

b&bf

Sheffield Children's
NHS Foundation Trust

Sheffield Primary Care Trust

D4D would like to thank the following funding institutions for their commitment to our organisation and for their continuous support for innovation in the health sector.

Department of Health

EPSRC
Engineering and Physical Sciences Research Council

MRC Medical Research Council

Technology Strategy Board
Driving Innovation

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Foreword

The National Institute for Health Research Devices for Dignity Healthcare Technology Co-operative (D4D) has achieved much in its first five years and I am proud of the difference we have made to the dignity and independence of people and the technologies we have been able to realise.

This booklet is a celebration of our work and successes, focussing on real examples of how we have collaboratively developed new technologies and treatments, and helped pave the way for the HTCs of today and tomorrow.

D4D's scope spans clinical conditions and the age spectrum with the clear goal of helping people regain the control over their lives which is often lost when dealing with chronic conditions - with a special focus on maintaining dignity and independence.

D4D's vision was created in 2007, and is as relevant today as ever:

"To deliver innovative healthcare technologies that preserve dignity and promote independence for people living with long-term conditions."

D4D has benefitted in the pilot phase from financial support from the National Institute for Health Research (NIHR), the Technology Strategy Board (TSB), the Engineering and Physical Sciences Research Council (EPSRC), the Medical Research Council (MRC) and the Department of Health (DH).

We are immensely grateful for this support which has enabled the development of this programme, and importantly is providing hope to people suffering from long term conditions.

Together with my dedicated team, I look forward to the future...

Professor Wendy Tindale OBE
Clinical Director, NIHR Devices for Dignity HTC
Consultant Clinical Scientist and Scientific Director,
Sheffield Teaching Hospitals

"The D4D pilot HTC has allowed the rapid creation of technologies that can enable patients to remain in their homes, providing independence and dignity, and reducing the need for hospital admission. The NIHR D4D HTC can continue to support and develop innovations for unmet needs as one of the newly funded NIHR HTCs over the next three years."

**Professor Dame Sally C. Davies,
Chief Medical Officer and
Chief Scientific Advisor
Department of Health**

Introduction

When the Devices for Dignity (D4D) Healthcare Technology Co-operative (HTC) was established as one of the first two Pilot HTCs in January 2008, it had a simple but extensive remit, "To deliver innovative healthcare technologies that preserve dignity and promote independence for people living with long-term conditions."

From very small beginnings the organisation evolved rapidly and its influence grew through the **linking of its partners** and **communicating with its stakeholders.**

Across its five year pilot programme D4D has created a **robust Innovation Model (see page 13)** that can rapidly identify and validate unmet needs and accelerate the design, development and evaluation of technical innovations to address those unmet needs.

This has led to the assessment of almost **200 innovative technologies.**

D4D has engaged a **widespread national network** on a variety of technology developments across its three focus areas: Renal Technologies, Assistive Technologies, and Urinary Continence Management.

In addition to its core partners, D4D has engaged:

120 companies
20 NHS Trusts
20 Universities
19 Patient interest groups/charities

At the core of D4D is a partnership which includes seven NHS trusts and three universities.

Hosted by:
Sheffield Teaching Hospitals NHS Foundation Trust

Charity Organisations:
Assist UK
Bladder & Bowel Foundation

NHS Trusts:
Barnsley Hospital NHS Foundation Trust
Central Manchester University Hospitals NHS Foundation Trust
Leeds Teaching Hospitals NHS Trust
North Bristol NHS Trust
Sheffield Children's NHS Foundation Trust
Newcastle Upon Tyne Hospitals NHS Foundation Trust

Universities:
University of Cambridge
Coventry University
University of Sheffield

> "Being the host Trust for D4D has provided us with a valuable insight into how the pilot project has focused on Patient Centred Care, leading to real improvements in patients' dignity.
>
> The learning that D4D has gathered throughout this project has provided a framework to support new HTCs and made a considerable impact in areas of healthcare that directly affect millions of lives."
>
> **Sir Andrew Cash,**
> **Chief Executive**
> **Sheffield Teaching Hospitals NHS Foundation Trust**

D4D has been recognised with multiple awards including: 2012 Advancing Healthcare Awards' Allied Health Professionals and Healthcare Scientists: Leading Together On Health Award. Clinical Director of D4D, Professor Wendy Tindale was honoured with the Lifetime Achievement award at the 2012 Medilink Healthcare Business Awards and **she was also named one of the top 50 most inspirational female leaders in healthcare** by the Health Services Journal in 2013

Dignity & Independence

The UK Department of Health's 'Dignity in Care' agenda was one of a number of driving forces in the creation of D4D.

It underpins D4D's belief that for people living with long-term conditions, preserving dignity and independence often becomes a major challenge; the very medical technologies that should be supportive, can actually add to user burden because important aspects of device design and development (such as user acceptability and impact) are often not adequately considered. D4D recognised the importance of taking a **more holistic view of medical technology innovation** which integrates the requirements of technology users to support them in regaining aspects of control in their lives.

In collaboration with the University of Sheffield's School of Health and Related Research (ScHARR), D4D looked at how to assess the 'value of dignity'.

This project has the potential to create a standard for measuring an individual's dignity as a health outcome.

D4D's mission

"To deliver innovative healthcare technologies that preserve dignity and promote independence for people living with long-term conditions."

Urinary Continence Management

Urinary incontinence affects 13% of women and 5% of men at some stage of their lives and can have a devastating effect on quality of life. It can result in loss of employment and social isolation, and is the second most common reason for older people moving into care.

D4D created a **network of clinical, commercial, academic and patient expertise** to ensure that in the pilot phase a range of high-impact new product ideas could be reviewed **leading to new technology developments**,focused on improving either, diagnosis, treatment or management, and quality of life for those experiencing urine storage or voiding difficulties.

Professor Christopher Chapple
UCM Theme Lead

D4D has a portfolio of complementary projects aimed at reducing incidences of catheter acquired urinary tract infections (CAUTIs). CAUTI cost the NHS around £125M per annum. A resulting reduction of CAUTI by a modest 5% would save the NHS in excess of £6M annually.

Baby Bear Leg Bags

This project developed novel urinary collection bags specifically for children and infants aged between 0-5 who have their own, individual needs.

The Baby Bear bags make living with a continence problem more tolerable for the young patients, their parents and carers.

The range of bags, developed by Great Bear Healthcare Ltd with the support of D4D, have a number of unique design features that reduce the 'medical' look, improve ease of use and are more comfortable and appealing for young leg bag users.

Assistive Technologies

There are over **11 million** people living with a limiting long-term illness, impairment or disability in the UK.

D4D's own specialist Innovation Model (see page 13) made possible the effective identification of new product technologies in this diverse theme.

This led to the assessment of **new unmet needs covering all aspects of Assistive Technologies** including mobility, eating and drinking, aids for daily living and communication.

Professor Mark Hawley
ART Theme Lead

A wide range of unmet needs were identified and investigated which led to several key technology development projects including, including a novel Shower Chair for disabled people, developed in collaboration with Spinal Injuries units at Sheffield Teaching Hospitals, Stoke Mandeville Hospital and Kingkraft Ltd.

Another novel technology, the Paediatric Wheelchair, has a modular design which enables it to evolve to accommodate a child's growth. The project saw collaboration with the mobility charity, Whizz-Kidz, a renowned engineering consultancy, Frazer-Nash and a leading product design company, Renfrew Group International, together with Sheffield Children's Hospital and Great Ormond Street Hospital **to ensure a user-centred approach that examined the full and complex user requirements associated with the unmet need.**

"… so please make a height-adjustable wheelchair in which I can touch the floor and feel the sand at the beach with my bare feet!! "

A child's feedback, given after a D4D-backed research session

Renal Technologies

Over 50,000 people in the UK suffer from kidney failure. **D4D's Renal Technologies theme was established to develop systems, devices and services** which assist the independence of people with renal conditions.

Dr Elizabeth Lindley
RT Theme Lead

Although the Renal Technologies (RT) field is relatively small, its technologies have the potential for high impact. Focused assessment of renal unmet needs yielded two new **high-quality product and service innovation technologies.**

Patients can take up to 7 hours end-to-end to receive dialysis in hospital - effectively they are "living to dialyse." **A Portable Haemodialysis Machine,** developed by a UK company, Quanta Fluid Solutions, which is nearing clinical evaluation stage - aims to provide more frequent, more flexible, shorter dialysis sessions in the home, improving dignity and patient well-being.

Another key impact from the D4D pilot is the widespread use of the Fresenius Body Composition Monitor (BCM) for adults on haemodialysis. This followed validation by D4D - facilitated by a comprehensive understanding of its benefits, **resulting from input provided by D4D's expert networks of clinicians, patients and industrial collaborators.**

Innovation Model

In the pilot phase of the D4D programme, it was important to create a **unique innovation model** which established the technology innovation process starting with the **identification of unmet clinical needs**.

This robust and effective innovation model facilitates rapid product and service review - ensuring technologies are developed that can **support people's dignity and independence.**

This has been developed through **D4D's clinician-led working relationships between technology users, healthcare professionals, academia and industry** - that discovers, designs, develops, evaluates and disseminates new technology.

Engaging the right stakeholder at the right time of the project is vital to optimise the results of this model, and D4D have created an acctive portfolio of technologies based on patient need.

"D4D have pump-primed innovations and developed these further with commercial and public funding, leveraging over £5.5m of funding - which is equivalent to an extra £3 invested for every £1 put in by D4D."

Expert networks

Co-operation is a fundamental building block of the HTC Programme, and working effectively across a range of organisations and sectors has been a vital part of D4D's success.

An important element of this has been the creation of National Expert Networks - which has enabled access to the knowledge needed to:

- **Identify unmet needs**
- **View these needs from the perspective of technology users, carers and clinicians**
- **Understand the problem from a hospital or community setting**
- **Work with the recognised experts in the field**
- **Identify the potential barriers to the uptake of the product within the NHS**

National Expert Networks are a vital part of D4D's approach and this has led to the creation of networks in all its focus areas. Seeking knowledge from these networks takes place at every stage of D4D's Innovation Model.

Access to such multidisciplinary expertise enhances D4D's research projects and provides opportunities for collaborating researchers to engage with a wide range of highly-creative and challenging projects.

In a project to develop a wheelchair for children with complex needs, D4D formed an inter-disciplinary group engaging with occupational therapists, clinical scientists, clinical engineers, paediatricians, designers, children and their carers to develop a design specification. It enabled the designers to understand what was needed, exploring all aspects of a child's life (not just clinical!). The result is a prototype that has enormous appeal for both highly-dependent children and the more independent wheelchair user.

D4D is committed to patient and public involvement, and strategic partnerships with key charities has allowed the exploration of unmet clinical needs directly with the people who are best placed to identify them - patients and carers.

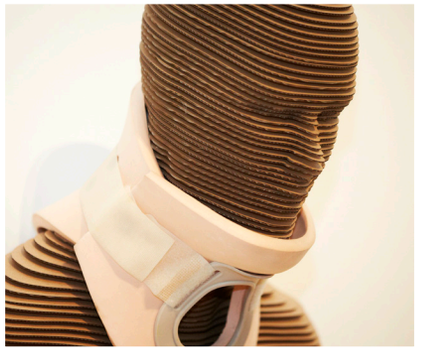
Paving the way...

As a result of the pilot programme, D4D has;

- Demonstrated the **high demand** and appetite for working across organisational and cultural boundaries
- Enabled industry to **access NHS** intelligence, know-how and support in a way not previously accessible
- Demonstrated to the NHS the value of **working strategically** with industry partners
- Enabled **patients to be a genuine and meaningful part** of the development journey
- Delivered **new products to patients**
- Demonstrated the value of charity partnerships.

"D4D has developed innovative ways to really understand the healthcare needs of our patients through creating partnerships."

Nicola Heron
D4D Programme Manager



D4D now and in the future

D4D is proud of its pilot phase - and its commitment to working in partnership has helped translate research and innovation to bedsides - at home or in hospital.

D4D is especially pleased to have been successful in its bid to be part of the new expanded national framework of NIHR HTCs. D4D has already expanded to include two new NHS Trusts as partners, namely Central Manchester University Hospitals NHS Foundation Trust and Newcastle Upon Tyne Hospitals NHS Foundation Trust and has also extended its involvement of existing NHS partners.

Through this expansion it has deepened and extended its expert clinical networks in chronic kidney disease, continence and rehabilitation and developed an expert technical network in healthcare technology development. Its Assistive Technology Theme has evolved to include Rehabilitative Technologies in response to demand.

The future...

D4D is looking forward to extending its impact and influence further through new collaboration partnerships with the new infrastructures and networks being established including: HTCs, the Engineering and Physical Sciences Networks and NHS England's Academic Health Science Networks.

D4D will use new and existing networks to bring to commercialisation its growing portfolio of technology developments, so that they deliver direct improvements in dignity and independence to patients.

Notes

The NIHR Devices for Dignity HTC team

From back, left to right:
Kirsty Kassim - Programme Administrator, Dr Avril McCarthy - Med Tech Lead, Prof Wendy Tindale - OBE Clinical Director, Dr Nicola Heron - Programme Manager, Martin Slovak - Research Associate, Lise Sproson - Research Associate,

From front, left to right:
Dr Angel Jimenez-Aranda - Project Manager, Oliver Wells - D4D Ltd Commercial Director

There have been so many contributors over the years and we want to say a special thanks to all our industry partners, charity collaborators and funders. We want to say a particular thanks to...

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NHS
National Institute for
Health Research

The National Institute for Health Research Healthcare Technology Co-operative for Devices for Dignity at Sheffield Teaching Hospitals NHS Foundation Trust.

www.d4d.htc.nihr.ac.uk