



Department
of Health

Research and development work relating to assistive technology

2015-16

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Presented to Parliament pursuant to Section 22 of
the Chronically Sick and Disabled Persons Act 1970



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Introduction

About this report

Section 22 of the Chronically Sick and Disabled Persons Act 1970 requires a report to be laid before Parliament each year on progress made in Government-funded research relating to equipment that might increase the range of activities and independence or well-being of disabled people, known as assistive technology.

Working with stakeholders, in 2001 the Foundation for Assistive Technology developed the following definition for assistive technology:

Assistive technology is any product or service designed to enable independence for disabled and older people.

This broad definition means that a wide range of products and services are eligible for inclusion in the report. As technology advances, the breadth of work covered is constantly expanding. The research covers not only specific products, but also systems, combinations of technologies, and interfaces to mainstream technology such as the internet.

For the purpose of this report, products and systems are further classified as assistive technology if their adoption and use is under some measure of control by the disabled and older end user and there is a level of meaningful interaction by the end user with the product or system. This therefore excludes telemedicine services such as videoconferencing between a general practitioner and a hospital consultant, using equipment in the hospital and GP surgery, as these technologies are primarily used by, and operated under the control of, the healthcare professionals. Neither does the report feature research on implanted technologies over which the user has no control or interaction, such as hip replacements. The report aims to reflect research relating to a wide range of impairments and conditions, and to cover research on service provision and patterns of use as well as development and evaluation of technologies.

The 2015/16 report highlights developments in priority setting and funding for assistive technology research and innovation, some particular areas of research activity, and the role of Academic Health Science Networks in supporting uptake and spread of assistive technology. The Annex provides a listing of Government-funded assistive technology research and development projects current in 2015/16.

Developments in priority setting and funding

James Lind Alliance Priority Setting Partnerships

The James Lind Alliance (JLA) is a non-profit making initiative established in 2004^a. It brings patients, carers and clinicians together in Priority Setting Partnerships (PSPs) to identify and prioritise the Top 10 uncertainties, or unanswered questions, about the effects of treatments and other interventions such as assistive technologies. The aim of this is to make sure that health research funders are aware of the issues that matter most to patients and clinicians. The National Institute for Health Research (NIHR) funds the infrastructure of the JLA.

In 2014, the Mild to Moderate Hearing Loss PSP was established to gather and prioritise uncertainties in the prevention, diagnosis, and treatment of mild to moderate hearing loss in adults. The PSP was coordinated by the NIHR Nottingham Hearing Biomedical Research Unit in collaboration with Hearing Link, a UK charity for people with hearing loss and their friends & families, patients, clinicians, and their representative bodies.

The PSP published its Top 10 in September 2015^b. Six of the priorities relate directly to hearing aids:

- Does the early fitting of hearing aid(s) result in increased patient benefit and/or improved cost-effectiveness of the service?
- Does the early fitting of hearing aids slow the rate of cognitive decline?
- What are the reasons for low hearing aid uptake, use and adherence?
- Can new technologies replace hearing aids?
- Could new developments to digital hearing aids offer improved speech perception in noisy environments?
- Could the use of real-world sounds to help program hearing aids in clinic (rather than tones or beeps) improve hearing aid effectiveness?

In July 2014, the Childhood Disability PSP completed its mission to identify priorities for research into neurodisability in children. The NIHR is providing funding for primary research or evidence synthesis relating to several of the priorities. In October 2015, a project started that is preparing for a trial or trials of the effectiveness of standing frames to help children with cerebral palsy. Another project began in January 2016 that is identifying appropriate symbol communication aids for children who are non-speaking.

NIHR Biomedical Research Centres

The NIHR has launched a new, open competition for Biomedical Research Centre (BRC) designation and funding from April 2017 to March 2022^c. Following the initial set up in 2007/8, the NIHR held a second open competition in 2011 which designated and funded eleven BRCs and twenty Biomedical Research Units (BRUs) to help translate advances in biomedical research into benefit for patients. BRU funding has resulted in the delivery of a substantial

^a <http://www.jla.nihr.ac.uk/about-the-james-lind-alliance/>

^b <http://www.jla.nihr.ac.uk/priority-setting-partnerships/mild-to-moderate-hearing-loss/top-10-priorities/>

^c <http://www.nihr.ac.uk/about/biomedical-research-centres.htm>

portfolio of world-class research, building capacity and critical mass in identified priority areas over the period of BRU designation and funding. As such, the distinction between BRCs and BRUs has become less valid and the current BRU designation will be discontinued from April 2017.

The BRCs and BRUs have supported a range of translational research relevant to the development and use of assistive technologies. For example, the NIHR Oxford Biomedical Research Centre has supported work on devices enabling improvements in independent mobility for people with low vision.

Child prosthetics

In March 2016, the Chancellor's Budget announced that the Government will invest £1.5 million in child prosthetics, giving hundreds of children with limb deficiency access to sports prosthetics, and creating a fund to incentivise the development of new breakthrough innovative prosthetic products for the NHS. The Department of Health is currently working on plans for how best to distribute the £1.5 million of funding for child prosthetics and will set out comprehensive details once the plans are finalised.

Inclusive Technology Prize

The Inclusive Technology Prize is run by Nesta's Challenge Prize Centre in partnership with Leonard Cheshire Disability and with support from the Department for Work and Pensions, Innovate UK, the Department for Business Innovation and Skills and national law firm Irwin Mitchell. The Inclusive Technology Prize aims to support innovation in assistive tools and products that will benefit people with a disability or a long term illness in the UK. More than 200 ideas, created with or by disabled people, were entered from across the country, and the finalists included a 3D printed, functioning bionic hand for amputees, and a wheelchair lap belt that can be attached and released using one hand.

The inaugural Inclusive Technology Prize has been awarded to AzuleJoe, a tool that will help give people with communication difficulties a voice. AzuleJoe has been awarded £50,000 to help bring their free software to market. The software creates a screen-based tool that allows users to select the word they want - but cannot articulate - from icons representing words. The device will then speak the word out loud.

Intelligent Mobility Fund

In February 2016, the Government announced that eight projects have been awarded £20 million in funding to develop the next generation of autonomous vehicles. The projects are the first to be funded from the Government's £100 million Intelligent Mobility Fund. All the projects have received financial backing from industry in addition to Government funding, and are backed by leading automotive businesses, engineering firms, IT specialists, universities and local authorities.

One project is receiving £1.5 million from the Department for Business, Innovation and Skills to develop driverless shuttles with advanced sensors and control systems and trial them in city pedestrian areas, with a particular focus on improving urban accessibility for disabled and visually-impaired people. Members of the project consortium are Westfield Sportscars Ltd, Heathrow Enterprises Ltd, Fusion Processing Ltd, Creative Example Ltd, Conigital Ltd, and Birmingham City University.

Research current in 2015/16

Some particular areas of research activity are highlighted below.

Delivering Assisted Living Lifestyles at Scale

The Delivering assisted living lifestyles at scale (dallas) programme has been supported by £19 million investment by Innovate UK (Technology Strategy Board), £1 million investment by the NIHR and a further £5 million contribution from the Scottish Government, Highlands and Islands Enterprise and Scottish Enterprise. dallas has been offering products and services designed with users in mind, with health and care professionals asking people about the sort of care they want to receive and giving them the tools and opportunity to take greater control of their own health and care and the choices they make. dallas tasked four consortia: i-Focus, Year Zero, More Independent (Mi) and Living it Up (LiU) to think beyond traditional health and social care, to consider how new ideas and technology can be used to improve the way people live and transform their choices as they age.

Dallas has led to new products being used in the health and care system such as a House of memories smartphone app which was co-designed by people with dementia and their families with industry for Mi Liverpool. In the largest engagement campaign of this type, LiU worked with communities across Scotland to co-design a range of digital tools to support health, care and wellbeing.

The dallas programme's learning, knowhow and insights is now hosted by the Digital Health and Care Alliance (DHACA). DHACA is a sector wide organisation set up by the i-focus consortia with objectives to help catalyse the market in digital health and care by addressing key obstacles and points of market failure on a consensus-based approach.

Sensor Platform for Healthcare in a Residential Environment

Sensor Platform for Healthcare in a Residential Environment (SPHERE) has been awarded a grant of £12 million by the Engineering and Physical Sciences Research Council (EPSRC). SPHERE is a EPSRC Interdisciplinary Research Collaboration developing a number of different sensors that will combine to build a picture of how we live in our homes. This information can then be used to spot issues that might indicate a medical or well-being problem.

The technology could help in the following ways:

- Characterise the sedentary behaviour that is linked to so many conditions.
- Detect correlations between factors such as diet and sleep.
- Measure changes in movement, posture and patterns of movement over months.
- Analyse eating behaviour - including whether people are taking prescribed medication.
- Detect periods of depression or anxiety and intervene using a computer based therapy.
- Predict falls and detect strokes so that help may be summoned.

Self-report underpins our understanding of falls among people with Parkinson's as they largely happen unwitnessed at home. In a qualitative study performed under SPHERE, researchers used an ethnographic approach to investigate which in-home sensors, in which locations, could gather useful data about fall risk. Over six weeks, five independently mobile people with Parkinson's at high risk of falling were observed at home. The unobtrusive sensors were

acceptable to participants: the sensors could detect instability during everyday activity at home and potentially guide intervention.

Technologies to assist hearing and communication

The EPSRC is investing £5.3 million in eight projects focussed on optimising hearing aid devices for individuals, speech-in-noise performance in hearing aid devices, and new methods of signal transduction. These projects all started between July and December 2015.

An estimated quarter of a million people in the UK are unable to speak and are at risk of isolation. They depend on Voice Output Communication Aids (VOCAs) to compensate for their disability. However, the current state of the art VOCAs are only able to produce computerised speech at an insufficient rate of 8 to 10 words per minute. The EPSRC is investing £1 million in a project that started in February 2016 led by the University of Dundee. The researchers will develop technology which will leverage contextual data (e.g. information about location, conversational partners and past conversations) to support language prediction within an onscreen user interface which will adapt depending on the conversational topic, the conversational partner, the conversational setting and the physical ability of the nonspeaking person. The aim is to improve the communication experience of nonspeaking people by enabling them to tell their stories easily, at more acceptable speeds.

The NIHR is funding a £0.7 million project led by Manchester Metropolitan University to examine how vital symbol-based communication aids may be better prescribed to improve the quality of life for children with limited natural speech. The study began in January 2016. Children with little or no natural speech often communicate through symbolic communication aids to hold conversations and show their thoughts and feelings. Symbol aids are typically handheld devices or computer-based software that speak pre-stored words or phrases with images, thereby providing independent communication.

Hand prostheses

In April 2015, a project with £1.5 million funding from the EPSRC began that is aiming to develop a prosthetic hand that will give users a sense of feedback. The SenseBack project is led by Newcastle University and also involves experts from the universities of Leeds, Essex, Keele, Southampton and Imperial College London. The team will build fingertip sensors to give the prosthesis a realistic sense of touch, including pressure, shear and temperature. In addition, a 'virtual hand' will provide information on the sense of the hand's position and movement, known as proprioception. Finally, the system will translate the signals to a form the brain understands and stimulate the nervous system to help the user control the hand.

NIHR Invention for Innovation programme

The NIHR Invention for Innovation (i4i) programme is a translational funding scheme to advance healthcare technologies and interventions for increased patient benefit in areas of existing or emerging clinical need^d. i4i supports collaborative research and development projects that have demonstrated proof-of-principle and have a clear pathway towards adoption and commercialisation. The expected output is an advanced or clinically validated prototype medical

^d <http://www.nihr.ac.uk/funding/invention-for-innovation.htm>

device, technology or intervention. The aim is to de-risk projects and make them attractive to follow-on funders and investors.

One i4i project that started in September 2015 is addressing the need of young people with long-term mental health difficulties for support to ensure their voice is heard during therapy. The research will develop a smartphone and tablet app called 'Power Up' to support young people to have their say when accessing Child and Adolescent Mental Health Services. The ultimate aim is to produce a rigorously evaluated tool to help young people managing long-term mental health issues to understand, structure, and express their preferences and views.

Another i4i project began in November 2015 and is aiming to develop a low-cost wearable wireless device that patients can use independently at home while practicing standardised everyday activities to regain upper limb function following stroke. The device will incorporate feedback, presented on a computer/tablet, as motivating visualisations of movement showing the patients if they have moved in the correct way – such as reaching by extending their arm rather than leaning forward, and using their arm muscles efficiently. The same device, but with different software and interfaces, will satisfy the needs of therapists for a simple system to diagnose specific movement problems (for example, reduced range of movement or uncoordinated activity between muscles), to inform clinical decision-making, monitor progress and thus increase efficiency and effectiveness of therapy.

NIHR Healthcare Technology Co-operatives

NIHR Healthcare Technology Co-operatives (HTCs) are centres of expertise that work collaboratively with industry to develop concepts of new medical devices, healthcare technologies and technology-dependent interventions that improve treatment and quality of life for patients^e. The aims of the NIHR HTCs are to:

- Act as a catalyst for NHS 'pull' for the development of new medical devices, healthcare technologies and technology-dependent interventions.
- Focus on clinical areas and/or themes of high morbidity, which have high potential for improving quality of life of NHS patients and improving the effectiveness of healthcare services that support them.
- Work collaboratively with patients and patient groups, charities, industry and academics.

The NIHR is currently funding eight HTCs. The Devices for Dignity (D4D) HTC has a growing Assistive and Rehabilitative Technologies research theme. One project has developed an app to improve communication in the Intensive Care Unit (ICU) for the 30,000 patients who are mechanically-ventilated per year and have difficulty communicating their needs and concerns while acutely ill. One patient fed back *"I would lie awake waiting for the ward round, the one opportunity to talk to a doctor and when it came to it I couldn't talk and had to give up...I only got five minutes and if the nurse wasn't there (to help communicate) it was impossible."* Following work with ex-ICU patients to develop content, a prototype app has been created and will be piloted in St Mary's Hospital, London and Sheffield Teaching Hospitals in the first instance. The team won a Medipex NHS Innovation Award in November 2015 (Digital Health Category).

The Head Up project on combating neck weakness in motor neurone disease patients, conducted at Sheffield Hallam University, engaged a local patient group alongside a multidisciplinary team of experts, through the D4D HTC. This active involvement of local

^e <http://www.nihr.ac.uk/about/healthcare-technology-co-operatives.htm>

stakeholders enabled the development of a neck support collar that responds to patients' needs by helping them to communicate and eat. In June 2016, the D4D HTC reported that over 60 patients have now been recruited to a clinical evaluation of the device.

The HTC for Mental Health (MindTech) is currently investigating how digital tools such as mobile apps could be used to help deliver evidence-based treatments for Tourette Syndrome to young people and their families. Previous research by the MindTech team has shown that behavioural treatments such as Habit Reversal Therapy are effective in reducing tics in children and young people with TS. As part of this work the MindTech HTC ran a project in partnership with the University of Bath to investigate how existing mobile apps for relaxation may support the treatment of Tourette Syndrome and to discover what young people and their families think of these products.

Supporting uptake and spread of assistive technology

Academic Health Science Networks

Academic Health Science Networks (AHSNs) have been set up to support local health economies to improve health outcomes of their communities. AHSNs also maximise the contribution of the NHS to economic growth by enabling and catalysing change through collaboration, and the spread of innovation and best practice. To do this they work with local NHS partners, academia and industry.

AHSNs are supporting the uptake and spread of assistive technology through a range of projects in related fields, such as supporting telehealth/care pilots, supporting the development and adoption of innovative apps and devices, and helping develop the digital and informatics infrastructure. In addition, AHSNs have programmes of work targeted at specific patient groups such as older populations or those managing long term conditions.

Small Business Research Initiative for Healthcare

The Small Business Research Initiative for Healthcare (SBRI Healthcare) is an NHS England initiative, championed by the AHSNs. In December 2015, SBRI Healthcare announced phase 1 awards of up to £100,000 each to 11 companies in a competition to address challenges in older people with multiple-morbidities. Those businesses demonstrating best value and greatest technical feasibility in phase 1 will progress through to phase 2 to be further supported and funded to take their technologies through to commercialisation.

The awards include:

- Ally – Smart Home Care. This project aims to demonstrate the technical feasibility and benefits of an in-home early warning system for detecting increased frailty in elderly individuals.
- Inclusiviti Chair - an innovative wheelchair with features including increased manoeuvrability, a motorised mechanism to raise and lower so users can reach a kitchen worktop or sit at a table, and an automatic tilting mechanism to increase stability on ramps.
- 11Health & Technologies Ltd - Restoring control and quality of life within stoma care. This device allows patients to set personalised warning alarms for their ostomy bag, and also captures information on volume of output which can be emailed to patient and clinicians.

SBRI Healthcare is currently looking to award a total of £1.1 million for healthcare innovations that address challenges in the high need areas of 'Managing patient flow in acute care' and 'Self-care and independence for children with long-term conditions'. Winners will be announced in October 2016.

Through the work with the Yorkshire & Humber AHSN and The Technology Innovation Transforming Child Health (TITCH) Network, and consultation involving a broad range of health care professionals and families, a number of priority unmet health needs have been identified

for children and young people, which require innovative solutions. Applications to support self-care and independence in children with long term conditions have been invited in two key categories: Assisting or restoring function (limb rehabilitation), and Self-care & remote monitoring. One of the key challenges in developing technology for children and young people in this area, is that solutions must either be age specific and appropriate, or instead be versatile and adaptable to meet the physiological and anatomical changes aligned with growth and development.

Test Beds

The NHS Five Year Forward View^f, published in October 2014, set out the intention to develop a small number of 'test beds'. These sites will evaluate the real world impact of new technologies offering both better care and better value for taxpayers, testing them together with innovations in how NHS services are delivered.

The first wave of seven Test Beds were announced by NHS Chief Executive Simon Stevens at the World Economic Forum in Davos, Switzerland, on 22 January 2016. Frontline health and care workers in seven areas will pioneer and evaluate the use of novel combinations of interconnected devices such as wearable monitors, data analysis and ways of working which will help patients stay well and monitor their conditions themselves at home. Successful innovations will then be available for other parts of the country to adopt and adapt to the particular needs of their local populations. All of the test beds involve AHSNs.

One of the test beds - Technology Integrated Health Management - is led by Surrey & Borders NHS Foundation Trust working with the University of Surrey, Royal Holloway University of London, Kent, Surrey and Sussex AHSN, the Alzheimer's Society, local Clinical Commissioning Groups, charities and ten technology companies. The project will use technology to enable people with dementia to live in their own homes for longer. Individuals and their carers will be provided with sensors, wearables, monitors and other devices, which will combine into an 'Internet of Things' to monitor their health at home. The information from these devices will help people take more control over their own health and wellbeing, with the insights and alerts enabling health and social care staff to deliver more responsive and effective services.

NHS Innovation Accelerator

The aim of the NHS Innovation Accelerator (NIA) is to deliver on the commitment detailed within the Five Year Forward View – creating the conditions and cultural change necessary for proven innovations to be adopted faster and more systematically through the NHS, and to deliver examples into practice for demonstrable patient and population benefit. NIA 2016 will close to applications on 1 August. This round will focus on three challenges based on population health needs: Prevention, Early intervention, and Long term condition management. For the third challenge, innovations are sought that have been proven to support people with long-term conditions through, for example, improved self-management, mobilisation of support for people from within their local community, medicines optimisation and management across multiple conditions. The innovation can be a device, digital app or platform, a service, process or pathway, or workforce model. The successful applicants will be announced in October 2016.

^f <https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf>

Annex: Listing of assistive technology research and development projects 2015-16

Glossary of acronyms for funders:

AHRC	Arts and Humanities Research Council
BIS	Department for Business, Innovation and Skills
DH	Department of Health
EPSRC	Engineering and Physical Sciences Research Council
ESRC	Economic and Social Research Council
HEE	Health Education England
MRC	Medical Research Council
NIHR	National Institute for Health Research
PHA	Public Health Agency (Northern Ireland)

Project title, organisation, contact	Summary	Funding
<p>3rings smart plug 3Rings Care www.3rings.co.uk/contact</p>	<p>Proof of concept award for the '3rings Smart Plug'. This can be used to monitor use of a domestic appliance such as a kettle or TV. By monitoring 'activity' or 'lack of it', events can be communicated to families to make them aware of their elderly relatives' status, regardless of distance.</p>	<p>Innovate UK Mar 15 – Sep 15 £93,127</p>
<p>AAL-WELL: ambient assistive living technologies for wellness, engagement, and long life University of Sheffield www.catch.org.uk/contact-us</p>	<p>The project is harnessing the potential of ambient assistive technology to promote active and healthy aging for older people with mild cognitive impairment.</p> <p>In April 2016, a workshop was held to find out how people with memory problems incorporated technology into their lives, and how existing technologies might be able to help people manage memory difficulties in the future.</p>	<p>ESRC Apr 13 – Jan 17 £144,592</p>
<p>accessibility-enabled Health (aHealth) Dolphin Computer Access www.yourdolphin.com/contact</p>	<p>The focus of the aHealth project is to develop an innovative technology that will act as an accessibility layer or service for existing health and wellbeing-related technologies such that they are made accessible to blind/visually impaired people.</p>	<p>Innovate UK Dec 15 – Nov 16 £100,000</p>
<p>Accessibility Pad (aPad) Dolphin Computer Access www.yourdolphin.com/contact</p>	<p>The project aimed to develop a prototype device for the provision of accessibility software addressing the needs of people with visual impairment.</p>	<p>Innovate UK Apr 14 – Sep 15 £235,772</p>
<p>Accessible routes from crowdsourced cloud services University College London www.arccs.org/#!contact/c24vq</p>	<p>The project is using a crowdsourced approach to design an intelligent route planning system for wheelchair users in an urban environment.</p>	<p>EPSRC Oct 14 – Nov 16 £344,853</p>

Annex: Listing of assistive technology research and development projects 2015-16

Project title, organisation, contact	Summary	Funding
<p>Adaptive assistive rehabilitative technology: beyond the clinic University of Warwick www.aartbc.org/index.php/contact</p>	<p>Researchers will design and develop cheap, disposable, unobtrusive bio-sensors such as temporary tattoos and smart watches to use with patients who use wheelchairs or prosthetics, patients requiring rehabilitation, as well as older people.</p>	<p>EPSRC Apr 15 – Mar 18 £1,862,860</p>
<p>Aero hoist Kingkraft www.kingkraft.co.uk/pages/contact</p>	<p>Award for prototype development of a lightweight mobile hoist for the moving and handling of disabled, elderly and infirm people.</p>	<p>Innovate UK Jun 15 – Nov 15 £20,759</p>
<p>AeroPlus pressure ulcer care recliner device for plus sized users Medstrom www.medstrom.com/contact.html</p>	<p>The project aims to develop a prototype recliner device providing pressure reduction and maintaining optimal skin condition for users who are obese or morbidly obese.</p>	<p>Innovate UK Oct 15 – Mar 17 £87,192</p>
<p>AFOOT: ankle foot orthoses for people with stroke Salford Royal NHS Foundation Trust www.manchester.ac.uk/research/Sarah.tyson/personaldetails</p>	<p>The study compared two commonly used types of ankle foot orthosis: a bespoke and an off-the-shelf.</p>	<p>NIHR Jan 12 – Jun 15 £249,313</p>
<p>Airospring AS300 Baltex www.baltex.co.uk/contact</p>	<p>The company has developed a material with potential as a cushion material that uniformly distributes pressure and offers advantages for the relief of pressure ulcers particularly for wheelchair users and those who remain seated for long periods of time. The project aimed to develop prototype products for evaluation and testing.</p>	<p>Innovate UK Sep 13 – Aug 15 £229,961</p>

Project title, organisation, contact	Summary	Funding
<p>ADAM: anthropomorphic design for advanced manufacture</p> <p>University of Nottingham</p> <p>www.nottingham.ac.uk/engineering/people/ian.ashcroft</p>	<p>The researchers aim to develop an upper limb prosthesis integrated design system in which the needs of the patient, together with constraints, such as the manufacturing technologies available and requirements for device accreditation for healthcare, inform the whole design to manufacture process.</p>	<p>EPSRC</p> <p>Jan 16 – Jul 17</p> <p>£269,486</p>
<p>APTMAP: advanced pattern recognition technology for multi articulating prosthesis</p> <p>Touch Bionics</p> <p>www.touchbionics.com/contact/international</p>	<p>The research aimed to produce a brain-machine interface software and hardware solution providing upper limb amputees with a fully independent multi-articulating five digit prosthesis with advanced muscle signals to provide intuitive control.</p>	<p>Innovate UK</p> <p>Jan 13 – Jun 15</p> <p>£386,003</p>
<p>Assessment and treatment of patients with amblyopia using interactive binocular computer games</p> <p>Nottingham University Hospitals NHS Trust</p> <p>www.lazy-i-bit.com/</p>	<p>The researchers have previously developed a treatment for amblyopia which has shown improvements in vision with only three hours of treatment and which is fun to undertake (the I-BiT™ system). The current system is hospital based and the researchers aim to modify it for home use while including further improvements.</p>	<p>NIHR</p> <p>Sep 14 – Aug 17</p> <p>£902,919</p>
<p>Assistive smart watch applications</p> <p>Alcove</p> <p>www.youralcove.com</p>	<p>Proof of concept funding for assistive smart watch applications for trialling with older and disabled adults living in a social housing extra care setting in partnership with East Thames Housing Group</p>	<p>Innovate UK</p> <p>Apr 15 – Oct 15</p> <p>£76,308</p>
<p>Assistive technologies for Further Education and skills</p> <p>Jisc</p> <p>www.jisc.ac.uk/rd/projects/assistive-technologies-for-fe-and-skills</p>	<p>Projects funded in the area of assistive technologies are: Planning tool for autistic learners; User testing to support disabled learners; Raising mental health awareness through augmented reality; Kinetic applications.</p>	<p>Jisc (Jisc receives core funding from UK higher education and further education funding bodies)</p> <p>Apr 14 – Jul 15</p>

Annex: Listing of assistive technology research and development projects 2015-16

Project title, organisation, contact	Summary	Funding
<p>ATTILA trial: assistive technology and telecare to maintain independent living at home for people with dementia</p> <p>South London & Maudsley NHS Foundation Trust</p> <p>robert.j.howard@kcl.ac.uk</p>	<p>The study aims to find out if telecare can safely extend the time people with dementia can continue to live independently in their own homes, and whether this is cost effective. It also aims to find out if it can reduce the volume of acute, unplanned admissions to hospital, if it reduces stress in families and unpaid caregivers, and whether it can increase the quality of life of people living with dementia.</p>	<p>NIHR</p> <p>Jan 13 – Apr 19</p> <p>£1,801,834</p>
<p>Augmenting communication using environmental data to drive language prediction</p> <p>University of Dundee</p> <p>http://aac.dundee.ac.uk/ace-lp</p>	<p>The project aims to improve the communication experience of nonspeaking people by enabling them to tell their stories easily, at more acceptable speeds.</p>	<p>EPSRC</p> <p>Feb 16 – Jan 19</p> <p>£1,007,560</p>
<p>Autoseat project</p> <p>Autochair</p> <p>www.autochair.co.uk</p>	<p>The project is engineering and testing an electrically actuated mobility seat for vehicles.</p>	<p>Innovate UK</p> <p>May 15 – Oct 16</p> <p>£177,563</p>
<p>Big CACTUS: clinical and cost effectiveness of aphasia computer therapy compared with usual stimulation or attention control long term post stroke</p> <p>University of Sheffield</p> <p>www.sheffield.ac.uk/scharr/sections/dts/ctru/bigcactus</p>	<p>The study aims to compare outcomes for people with persistent aphasia using computerised speech and language therapy at home with those having usual care (standard speech and language therapy provision or general daily communication activity), or attention control (daily completion of puzzle book activities).</p>	<p>NIHR</p> <p>Jan 14 – Jan 19</p> <p>£1,480,713</p>
<p>Biomimetic, self tuning, fully adaptable smart lower limb prosthetics with energy recovery</p> <p>University of Leeds</p> <p>a.a.dehghani-sanij@leeds.ac.uk</p>	<p>Virtual prototyping of a semi-active lower limb prosthesis has been carried out and findings published:</p> <p>http://pih.sagepub.com/content/229/5/350</p>	<p>EPSRC</p> <p>Apr 13 – Mar 16</p> <p>£618,676</p>

Project title, organisation, contact	Summary	Funding
<p>Brain-computer interface for monitoring and inducing affective states</p> <p>University of Reading; Plymouth University</p> <p>s.j.nasuto@reading.ac.uk; eduardo.miranda@plymouth.ac.uk</p>	<p>The researchers are studying a brain-computer interface system that can monitor emotional states and, in combination with a database of music, generate sounds that can alter emotions. Such a system could be used potentially in treating mood disorders such as depression. Initial findings have been published, and the research was featured in March 2015 on Channel 5's The Gadget Show.</p>	<p>EPSRC</p> <p>Aug 12 – Mar 17</p> <p>£876,103</p>
<p>Care dryer</p> <p>Haystack Dryers</p> <p>www.haystack-dryers.com/contact.php</p>	<p>The project is developing a concept design of a care dryer to be used by people of all abilities either by themselves or aided by a carer, providing a warm relaxed hygienic experience which not only reduces the costs to the care home/facility but has a positive impact on the clients' well-being and to the environment.</p>	<p>Innovate UK</p> <p>Jan 16 – Dec 16</p> <p>£95,137</p>
<p>CHIRON-care at Home using Intelligent Robotic Omni-Functional Nodes</p> <p>Designability</p> <p>www.designability.org.uk/researchproject/chiron-care-at-home-using-intelligent-robotic-omni-functional-nodes/</p>	<p>The project is developing a set of intelligent modular robotic systems, located in multiple positions around the home. CHIRON would enable people to stay independent for longer, supporting them to undertake their own personal care tasks.</p>	<p>Innovate UK</p> <p>Mar 16 – Mar 18</p> <p>£2,155,780</p>
<p>Clasp: Digital Tactile Anxiety Management for the Health Internet of Things</p> <p>Lancaster University</p> <p>http://myclasp.org/about-clasp/contact-us/</p>	<p>The aim of this project is to co-design and co-produce, with a cohort of autism sufferers, their friends and family, a tactile digital anxiety management and peer-support tool to assist people with autism in understanding and managing their anxiety in social engagement.</p>	<p>EPSRC</p> <p>Jan 15 – Jul 16</p> <p>£293,031</p>

Annex: Listing of assistive technology research and development projects 2015-16

Project title, organisation, contact	Summary	Funding
<p>Co-producing socio-technical solutions for people living with complex multi-morbidity</p> <p>East London NHS Foundation Trust</p> <p>www.phc.ox.ac.uk/team/trish-greenhalgh</p>	<p>The research is exploring how to provide personalised and adaptive assisted living technologies for people with complex multi-morbidity.</p>	<p>NIHR</p> <p>Jun 15 – Nov 16</p> <p>£89,821</p>
<p>Cross-modal interactive tools for inclusive learning</p> <p>University of Bristol</p> <p>o.metatla@bristol.ac.uk</p>	<p>The aim of this fellowship is to research and develop interactive learning tools to make mixed classrooms more inclusive of visually impaired students.</p>	<p>EPSRC</p> <p>Mar 16 – Feb 21</p> <p>£716,108</p>
<p>D2ART: transforming disability arts through digital technologies</p> <p>University of Birmingham</p> <p>www.d2art.org/contact/</p>	<p>This collaborative project explored the potential of new innovative digital tools to support and extend the practice of physically disabled visual artists.</p>	<p>AHRC</p> <p>Apr 15 – Jan 16</p> <p>£39,688</p>
<p>Deep architectures for statistical speech synthesis</p> <p>University of Edinburgh</p> <p>www.research.ed.ac.uk/portal/en/persons/junichi-yamagishi</p>	<p>The project is creating technology to allow people to communicate in their own voice when their natural speech has become hard to understand or when they can no longer speak. The team has constructed personalised communication apps for ten people with motor neurone disease, with positive feedback.</p>	<p>EPSRC</p> <p>Nov 11 – Oct 16</p> <p>£741,163</p>
<p>Designing better hearing aids using physiologically inspired speech enhancement</p> <p>University of Southampton</p> <p>www.southampton.ac.uk/engineering/about/staff/bleeck.page#background</p>	<p>A conventional hearing aid amplifies both speech and background noise indiscriminately, so even though the neural pathways of the brain may be unimpaired, the task of distinguishing speech from noise becomes much harder. The project is developing engineering solutions to this speech-in-noise problem.</p>	<p>EPSRC</p> <p>Feb 13 – Sep 16</p> <p>£613,105</p>
<p>Detecting critical events in support of independent living at home</p> <p>Buddi</p> <p>www.buddi.co.uk/contact.php</p>	<p>In this project, Buddi aimed to develop a critical event sensing detector building on its existing personal alarm technology.</p>	<p>Innovate UK</p> <p>Apr 15 – May 16</p> <p>£100,000</p>

Project title, organisation, contact	Summary	Funding
<p>Developing Loc8torHC platform: Healthcare, Home Safety and Wellbeing monitoring for senior citizens</p> <p>Loc8tor</p> <p>www.loc8tor.com/uk/healthcare/contacts</p>	<p>The project aimed to develop Loc8tor HealthCare platform targeted at the retail market. The core product will include six core services; location, wander, fall, panic, activity and temperature in one device.</p>	<p>Innovate UK</p> <p>Apr 15 – Apr 16</p> <p>£197,837</p>
<p>Development, evaluation and implementation of a computer-based self-management programme for people with type 2 diabetes</p> <p>The Whittington Hospital NHS Trust</p> <p>www.ucl.ac.uk/pcph/research-groups/themes/e-health/projects/projects/dmsmp</p>	<p>The effectiveness and cost-effectiveness of a computer-based self-management programme (HeLP-Diabetes) is being evaluated as part of a trial. An implementation study is determining the impact it has on health and health outcomes in routine practice, and the resources needed for successful implementation.</p>	<p>NIHR</p> <p>Mar 11 – Aug 16</p> <p>£2,015,521</p>
<p>Development of a device for the motorised rehabilitation of walking</p> <p>University of Manchester</p> <p>www.manchester.ac.uk/research/Sarah.tyson/personaldetails</p>	<p>The project aims to develop a robot to retrain sit-to-stand and walking for people with severe disabilities.</p>	<p>NIHR</p> <p>Aug 14 – Oct 16</p> <p>£895,215</p>
<p>Early electrical stimulation to the wrist extensors and wrist flexors to prevent the post-stroke complications of pain and contractures in the paretic arm – a feasibility study</p> <p>Nottingham University Hospitals NHS Trust</p> <p>www.nottingham.ac.uk/research/groups/strokerehabilitation/projects/escaps.aspx</p>	<p>The study will evaluate the feasibility of running a definitive trial to ascertain the efficacy of using early, intensive electrical stimulation to prevent post stroke complications in the affected arm.</p>	<p>NIHR</p> <p>Apr 15 – Mar 18</p> <p>£234,871</p>
<p>EDLAH</p> <p>KG&S Ltd</p> <p>www.edlah.eu/partners.html</p>	<p>The EDLAH project aims to offer to older people a One Stop Shop of information and services on a tablet device, phone or web applications to support independent living.</p>	<p>Innovate UK</p> <p>May 13 – Apr 16</p> <p>£229,651</p>

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Project title, organisation, contact	Summary	Funding
<p>Empirical investigation and user-centred development of touch-screen text entry methods for older adults</p> <p>University of Strathclyde</p> <p>https://personal.cis.strath.ac.uk/mark.dunlop/contact/</p>	<p>The project has included investigation of a new touch-screen keyboard design for older adults that combines the familiar QWERTY keyboard layout with physical gesture. User studies with older adults showed the keyboard reduced miss-taps but was slower to use.</p>	<p>EPSRC</p> <p>Sep 13 – Aug 15</p> <p>£286,294</p>
<p>Empowering next generation implantable neural interfaces</p> <p>Imperial College London</p> <p>www.imperial.ac.uk/people/t.constantinou</p>	<p>This fellowship is focussing on next generation neural interfaces that can be used with assistive technologies.</p>	<p>EPSRC</p> <p>May 15 – Apr 20</p> <p>£1,016,560</p>
<p>Enabling technologies for sensory feedback in next generation assistive devices</p> <p>Newcastle University</p> <p>www.senseback.com/contact</p>	<p>The researchers will develop a prosthetic hand which will give users a sense of feedback.</p>	<p>EPSRC</p> <p>Apr 15 – Apr 18</p> <p>£1,444,280</p>
<p>Energy efficient lower limb prostheses</p> <p>University of Salford</p> <p>http://energy-efficient-lower-limb-prostheses.org.uk/contact/</p>	<p>The team are studying the potential for hydraulic technology to enable the controlled storage of energy, transfer of energy between joints, and return of energy in prosthetic legs.</p>	<p>EPSRC</p> <p>Sep 13 – Dec 16</p> <p>£671,817</p>
<p>Environment-aware listener-optimized binaural enhancement of speech</p> <p>Imperial College London</p> <p>http://www.imperial.ac.uk/people/mike.brookes</p>	<p>In this project the researchers will extend existing monaural binary masking techniques to provide binaural speech enhancement while preserving the inter-aural time and level differences that are critical for the spatial separation of sound sources. The researchers will also develop a metric able to predict the intelligibility of a speech signal for a binaural listener with normal or impaired hearing in the presence of competing noise sources. This metric is the key to finding automatically the optimum settings for individual listeners' hearing aids in a particular environment.</p>	<p>EPSRC</p> <p>Sep 15 – Aug 18</p> <p>£983,624</p>

Project title, organisation, contact	Summary	Funding
<p>A feasibility trial of Power Up: a smartphone and tablet app to support young people to make shared decisions in therapy</p> <p>University College London</p> <p>www.ucl.ac.uk/ebpu/about/EBPU_Staff_Profiles/Miranda_Wolpert</p>	<p>This research will develop a smartphone and tablet app called “Power Up” to support young people to have their say when accessing Child and Adolescent Mental Health Services.</p>	<p>NIHR</p> <p>Sep 15 – Mar 18</p> <p>£463,600</p>
<p>A feasibility study of using an immersive virtual reality environment to reduce anxiety in children with autism spectrum disorder</p> <p>Northumberland, Tyne and Wear NHS Trust</p> <p>www.ncl.ac.uk/ion/staff/profile/jeremy.parr.html#background</p>	<p>This research builds on an earlier study where eight of nine participants with autism spectrum disorder showed real life functional improvements and reduction in scores on anxiety scales after four 20-minute virtual reality environment sessions.</p>	<p>NIHR</p> <p>Feb 15 – Mar 17</p> <p>£244,542</p>
<p>A feasibility study of virtual reality as a therapeutic intervention in children with ambulatory cerebral palsy</p> <p>Sussex Community NHS Trust</p> <p>www.sussexcommunity.nhs.uk/get-involved/research/nintendo-wiifit-research.htm</p>	<p>This research will explore the potential of using a widely available computer console (the Nintendo Wii Fit) within the home to deliver regular, tailored physiotherapy schedules of Virtual Reality Therapy (VRT) for children with cerebral palsy.</p>	<p>NIHR</p> <p>Jan 15 – Dec 16</p> <p>£227,431</p>
<p>Frame fit: randomised controlled trial to determine the acceptability, safety and efficacy of a falls prevention exercise programme for walking frame users</p> <p>King’s College Hospital NHS Foundation Trust</p> <p>www.kch.nhs.uk/news/public/news/view/16541</p>	<p>This study aims to find out if an exercise programme specifically designed for walking frame users improves balance and reduces falls.</p>	<p>HEE / NIHR</p> <p>Apr 14 – Mar 18</p> <p>£157,871</p>

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<p>Freedom through design: putting people at the heart of wheelchair design</p> <p>Motivation Direct</p> <p>www.motivation.org.uk/contact</p>	<p>Following earlier proof of concept, this project aims to develop a range of six wheelchairs that can be assembled from one set of components.</p>	<p>Innovate UK</p> <p>Oct 15 – Mar 17</p> <p>£84,383</p>
<p>Generating and using “big data” to identify hearing aid patterns of usage in order to optimise and personalise fitting</p> <p>University of Manchester</p> <p>www.manchester.ac.uk/research/John.keane/personaldetails</p>	<p>A network of academics, clinicians and manufacturers of hearing aids and clinical diagnostic equipment is being used to characterise a hearing aid user by recording suitable measures of the pattern and site of hearing loss, the cognitive function of the aid wearer, and the experience of the wearer with using the hearing aid.</p>	<p>MRC</p> <p>Jul 15 – Dec 16</p> <p>£104,571</p>
<p>Graphene micro-sensors for adaptive acoustic transduction</p> <p>University of Edinburgh</p> <p>http://www.research.ed.ac.uk/portals/en/projects/graphene-microsensors-for-adaptive-acoustic-transduction-gmaat(2185fe11-a587-48ff-b4cf-d9736c2a0f9b).html</p>	<p>This project aims to develop novel acoustic transduction technology for use in hearing aids. The key proposition is to use an ultra thin-film membrane (graphene) as the vibrating mechanical component in a resonant gate transistor.</p>	<p>EPSRC</p> <p>Sep 15 – Aug 17</p> <p>£477,577</p>
<p>Hearing aids for music: exploring the music listening behaviour of people with hearing impairments</p> <p>University of Leeds</p> <p>http://musicandhearingaids.org/about-the-project/</p>	<p>This project represents the first large-scale systematic investigation of how music listening experiences are affected by deafness and the use of hearing aids.</p>	<p>AHRC</p> <p>Feb 15 – Jan 18</p> <p>£197,836</p>
<p>The Heels Trial: evaluation of lightweight fibreglass heel casts in the management of ulcers of the heel in diabetes</p> <p>Nottingham University Hospitals NHS Trust</p> <p>www.heels-trial.co.uk</p>	<p>The project is studying the effectiveness of lightweight fibreglass heel casts, or ‘heel cups’, in improving the rate of healing of ulcers in diabetes.</p>	<p>NIHR</p> <p>Feb 11 – Feb 17</p> <p>£1,358,852</p>

Project title, organisation, contact	Summary	Funding
<p>Home Service University of Sheffield www.catch.org.uk/contact-us/</p>	<p>This is a longitudinal study of ten elderly and physically disabled people using voice enabled assistive technology around the home. A demonstrator system consisting of a microphone and software running on a tablet device has been deployed in these homes and links back to speech recognition systems running on central servers.</p>	<p>EPSRC Sep 11 – May 16 £600,000</p>
<p>I-DRESS University of the West of England www.brl.ac.uk/researchthemes/medralrobotics.aspx</p>	<p>The project aims to develop a robotic system providing proactive assistance with dressing to disabled users. The research is being undertaken with partner organisations in Spain and Switzerland.</p>	<p>EPSRC Oct 15 – Sep 18 £305,523</p>
<p>i-Focus Advanced Digital Institute www.adi-uk.com/adi-contact.html</p>	<p>i-focus has aimed to improve how assisted living technology is used and deployed at pace and scale across all <i>dallas (delivering assisted living lifestyles at scale)</i> communities. DHACA (Digital Health and Care Alliance) has been formed to continue the promotion of interoperability across the health and care sector.</p>	<p>Innovate UK Jun 12 – May 15 £2,008,520</p>
<p>Identifying appropriate symbol communication aids for children who are non-speaking Manchester Metropolitan University www.rihsc.mmu.ac.uk/staff/profile.php?name=janice&surname=murray</p>	<p>The research aims to determine how to optimise clinicians' decisions about the provision of symbol communication aids.</p>	<p>NIHR Jan 16 – Jul 19 £686,112</p>

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Project title, organisation, contact	Summary	Funding
<p>Improve the health and wellbeing of older people and the quality of community care they receive, especially for people living with dementia</p> <p>Newcastle University www.ncl.ac.uk/ihs/people/profile/a.l.robinson</p>	<p>This NIHR Professorship has supported studies relating to awareness and use of assistive technology by people with dementia and their families:</p> <p>www.biomedcentral.com/content/pdf/s12877-015-0091-3.pdf http://bmjopen.bmj.com/content/6/5/e011132.full.pdf+html</p>	<p>NIHR May 12 – Apr 17 £1,137,389</p>
<p>'In the making': a co-constructed mapping and feasibility study of digital fabrication labs and their potential to catalyse cultural change</p> <p>University of Salford www.seek.salford.ac.uk/profiles/UHURLEY.jsp</p>	<p>There are already examples of disabled people using digital fabrication to design and produce objects, such as ramps, that make day-to-day life easier. The researchers are studying the potential for this technology to help to improve the lives of disabled people, their families and the communities in which they live.</p> <p>A series of workshops has been run with disabled people:</p> <p>https://hci.sbg.ac.at/wp-content/uploads/2015/11/Breadth_Depth_Height.pdf</p>	<p>AHRC Jan 15 – Jun 16 £81,002</p>
<p>Limb Glider intelligent rehabilitation device</p> <p>Vivo Smart Medical Devices www.vivosmartmedical.com/contact/contact-details</p>	<p>The project aims to develop an intelligent device for home rehabilitation for lower and upper limbs.</p>	<p>Innovate UK Jan 15 – Dec 16 £239,711</p>
<p>Living it up</p> <p>NHS 24 Scotland https://portal.livingitup.org.uk/page/contact-us</p>	<p>Living It Up is one of four communities funded to deliver assisted living services at scale. The Living it Up web portal has been created to allow people to obtain advice and form social contacts in their area or online.</p>	<p>Innovate UK Jun 12 – May 15</p>

Project title, organisation, contact	Summary	Funding
<p>Ludic artefacts: using gesture and haptics to support subjective wellbeing of people with dementia</p> <p>Cardiff Metropolitan University</p> <p>www.cathytreadaway.com/research/designing-for-dementia/laugh/</p>	<p>The project is investigating ways of supporting the wellbeing of people with late stage dementia through the development of new kinds of playful artefacts.</p>	<p>AHRC</p> <p>Apr 15 – Apr 18</p> <p>£424,183</p>
<p>Machine learning for hearing aids: intelligent processing and fitting</p> <p>University of Cambridge</p> <p>http://learning.eng.cam.ac.uk/Public/Turner/Turner</p>	<p>Current hearing aids suffer from two major limitations: hearing aid audio processing strategies are inflexible and do not adapt sufficiently to the listening environment, and; hearing tests and hearing aid fitting procedures do not allow reliable diagnosis of the underlying nature of the hearing loss and frequently lead to poor fitting of devices. This research will use new machine learning methods to revolutionise both of these aspects of hearing aid technology, leading to intelligent hearing devices and testing procedures which actively learn about a patient's hearing loss enabling more personalised fitting.</p>	<p>EPSRC</p> <p>Dec 15 – Nov 18</p> <p>£565,347</p>
<p>Mechanical Muscle Activity with Real-time Kinematics (M-MARK): A novel combination of existing technologies to improve arm recovery following stroke</p> <p>University of Southampton</p> <p>www.southampton.ac.uk/healthsciences/about/staff/jane_burridge.page#contact</p>	<p>M-MARK will help stroke patients regain arm function by supporting independent home-exercise. M-MARK will provide feedback on an iPad, using either an avatar (a human-like figure that mimics patients' movements) or through success playing games.</p>	<p>NIHR</p> <p>Nov 15 – Oct 17</p> <p>£935,455</p>
<p>MICA: integrated interfacial sensors for assessments of lower limb prosthetics</p> <p>University of Southampton</p> <p>www.southampton.ac.uk/engineering/about/staff/ldjiang.page#contact</p>	<p>The researchers aimed to develop a prototype intelligent prosthetic liner that will allow clinicians to quickly and accurately assess and optimise socket fit.</p>	<p>MRC</p> <p>Apr 14 – Apr 16</p> <p>£428,803</p>

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Project title, organisation, contact	Summary	Funding
<p>A multi-centre randomised controlled trial to assess the effectiveness and cost effectiveness of a home-based self-management standing frame programme in people with progressive MS</p> <p>Plymouth Hospitals NHS trust</p> <p>www.plymouth.ac.uk/research/su ms</p>	<p>Recruitment is ongoing. One trial participant has commented:</p> <p><i>“This programme has improved my posture considerably as well as my confidence.”</i></p>	<p>NIHR</p> <p>May 15 – Apr 18</p> <p>£343,761</p>
<p>New pathways to hearing: a multisensory noise reducing and palate based sensory substitution device for speech perception</p> <p>University College London</p> <p>https://iris.ucl.ac.uk/iris/browse/profile?upi=JISKI83</p>	<p>Commercially available correction for hearing loss is mostly limited to hearing aids and cochlear implants. These devices suffer from signal processing and sensory transduction limitations. This research aims to address these limitations through multisensory remapping.</p>	<p>EPSRC</p> <p>Dec 15 – Dec 18</p> <p>£700,744</p>
<p>Novel directional microphone design for speech enhancement in complex environments</p> <p>University of Strathclyde</p> <p>https://pure.strath.ac.uk/portal/en/projects/novel-directional-microphone-design-for-speech-enhancement-in-complex-environments(f8589bdd-df47-473d-b9e1-cae6b690ef42).html</p>	<p>The primary objective of the project is to create a hearing aid system that can reduce or control unwanted noises, focusing the hearing aid on only the sound arriving from in front of the user.</p>	<p>EPSRC</p> <p>Jul 15 – Jun 18</p> <p>£432,134</p>
<p>Occupational therapy intervention for residents with stroke living in UK care homes</p> <p>University of East Anglia</p> <p>www.uea.ac.uk/health-sciences/people/profile/g-peryer</p>	<p>A targeted three month programme of occupational therapy that included environmental adaptations was evaluated. The trial provided no evidence of benefit for the provision of a routine occupational therapy service for care home residents living with stroke related disabilities.</p>	<p>NIHR</p> <p>Sep 09 – Aug 15</p> <p>£1,930,486</p>

Project title, organisation, contact	Summary	Funding
<p>Performance-based selective training for robot-mediated upper limb motor learning and stroke rehabilitation</p> <p>University of Birmingham</p> <p>www.birmingham.ac.uk/staff/profiles/psychology/miall-chris.aspx</p>	<p>Over half of stroke survivors experience difficulty with reaching and grasping. Recent research suggests that therapy-assisted rehabilitation works because it is personalised to the individual and focuses on those areas which the individual finds most difficult. The project aimed to replicate this approach for this robot-mediated rehabilitation programme, changing task difficulty across training sessions.</p>	<p>MRC</p> <p>Nov 12 – Oct 15</p> <p>£404,452</p>
<p>Personalised fitting and evaluation of hearing aids with EEG responses</p> <p>University of Southampton</p> <p>www.southampton.ac.uk/engineering/about/staff/stevebel.page#contact</p>	<p>The project aims to improve personalised fitting of hearing aids to individual patients. The research seeks to achieve a robust assessment of hearing function and speech processing in the brain (from the cochlea to the brain stem and cerebral cortex) by the computer analysis of electroencephalographic responses to complex real-world signals.</p>	<p>EPSRC</p> <p>Jul 15 – Jun 18</p> <p>£908,086</p>
<p>Personalised monitoring and enhanced self-management in mental health (CareLoop)</p> <p>University of Manchester</p> <p>www.population-health.manchester.ac.uk/healthinformatics/research/Careloop/</p>	<p>The project aimed to build a system for long-term symptom monitoring in mental health that can be linked to hospital and community based IT and care management systems.</p>	<p>MRC</p> <p>Feb 13 – Oct 15</p> <p>£897,681</p>
<p>Piezoelectric nano-fibre based acoustic sensors for artificial cochlea</p> <p>University College London</p> <p>https://iris.ucl.ac.uk/iris/browse/profile?upi=WSONG66</p>	<p>This research seeks to enable a potential new generation of cochlear implants based on piezo-nanofibre with high performance and prolonged implantation. This could improve listening abilities offered by cochlear implants.</p>	<p>EPSRC</p> <p>Sep 15 – Aug 18</p> <p>£870,392</p>

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Project title, organisation, contact	Summary	Funding
<p>Portable electronic vision enhancement systems for near vision in visual impairment</p> <p>University of Manchester</p> <p>www.manchester.ac.uk/research/Chris.dickinson/personaldetails</p>	<p>This study investigated whether electronic magnifiers offer real benefit to patients or whether optical magnifiers are in fact just as good or better.</p>	<p>NIHR</p> <p>Jan 13 – Jul 15</p> <p>£262,643</p>
<p>PREDICT: randomised controlled trial of continuous positive airway pressure treatment in older people with obstructive sleep apnoea syndrome</p> <p>Imperial College London</p> <p>www.imperial.ac.uk/people/m.morrel</p>	<p>The trial found that in older people with obstructive sleep apnoea syndrome, continuous positive airway pressure reduces sleepiness and is marginally more cost-effective than best supportive care over 12 months.</p>	<p>NIHR</p> <p>Aug 09 – Jun 15</p> <p>£1,464,822</p>
<p>Pressure care support surface and suspension device technology for the treatment and prevention of pressure ulcers</p> <p>Talar-Made</p> <p>www.talarmade.com/contactus.aspx</p>	<p>The project aims to demonstrate proof of concept for a novel technological support solution to managing and treating pressure ulcers.</p>	<p>Innovate UK</p> <p>Feb 15 – Apr 16</p> <p>£100,000</p>
<p>Pressure relieving support surfaces (PRESSURE 2)</p> <p>University of Leeds</p> <p>http://medhealth.leeds.ac.uk/info/400/leeds_institute_of_clinical_trials_research/1022/contact_us</p>	<p>The project is investigating the difference between high specification foam mattresses and alternating pressure mattresses.</p>	<p>NIHR</p> <p>Mar 13 – Oct 17</p> <p>£1,856,758</p>
<p>RATULS: robot assisted training for the upper limb after stroke</p> <p>Newcastle University</p> <p>https://research.ncl.ac.uk/ratuls/contact%20us/</p>	<p>The research is evaluating the impact of robot assisted training on arm function after stroke.</p>	<p>NIHR</p> <p>Jan 14 – Apr 19</p> <p>£3,094,000</p>

Project title, organisation, contact	Summary	Funding
<p>SafeReads: a productivity tool for learners with dyslexia</p> <p>Dolphin Computer Access</p> <p>https://safereadsproject.wordpress.com/</p>	<p>The project aimed to design and develop a productivity tool for children with dyslexia transitioning from Key Stage 2 to 3 (ages 8-14). The tool will support children in recognising problems with reading, teaching them to use strategies so that they cope with these problems and helping them to learn how to monitor their own progress.</p>	<p>Innovate UK</p> <p>Nov 14 – Apr 15</p> <p>£79,937</p>
<p>SAMS: software architecture for mental health self management</p> <p>University of Manchester; Lancaster University; King's College London</p> <p>http://ucrel.lancs.ac.uk/sams/contact.php</p>	<p>Promoting self-awareness of change in cognitive function is a key step in encouraging people to self-refer for assessment for dementia related conditions. The project aims to develop a tool to help individuals develop this self-awareness. The researchers are currently designing the data and text mining software and carrying out preliminary analysis on the logging data from the longitudinal study which will run until August 2016.</p>	<p>EPSRC</p> <p>Apr 13 – Sep 16</p> <p>£692,196</p>
<p>Sensor Platform for Healthcare in a Residential Environment (SPHERE)</p> <p>University of Bristol</p> <p>http://www.irc-sphere.ac.uk/contact</p>	<p>SPHERE is a EPSRC Interdisciplinary Research Collaboration developing a number of different sensors that will combine to build a picture of how we live in our homes. This information can then be used to spot issues that might indicate a medical or well-being problem.</p>	<p>EPSRC</p> <p>Oct 13 – Sep 18</p> <p>£11,683,500</p>
<p>Simultaneous control of multiple degrees of freedom in myoelectric hand prostheses (SimCon)</p> <p>Newcastle University</p> <p>www.ncl.ac.uk/eee/staff/profile/ki-anoushnazarpour.html#background</p>	<p>The project aims to develop a radically novel and biologically-informed control approach that enables simultaneous control of multiple joints in an upper-limb prosthesis.</p>	<p>EPSRC</p> <p>Sep 15 – Dec 16</p> <p>£100,277</p>

Annex: Listing of assistive technology research and development projects 2015-16

Project title, organisation, contact	Summary	Funding
<p>Smart composite puncture-proof and flat-free tyres</p> <p>Flat Free Tyres (t/a Greentyre)</p> <p>http://www.greentyre.co.uk/contact.php</p>	<p>The research aimed to develop an advanced flat-free tyre to meet demand in the wheelchair and other markets.</p>	<p>Innovate UK</p> <p>Oct 14 – Mar 16</p> <p>£161,235</p>
<p>SONOPA: social networks for older adults to promote an active life</p> <p>Docobo</p> <p>www.docobo.co.uk/contact-docobo.html</p>	<p>Innovate UK has co-funded this European project which combined a social network with activity recognition in a smart home environment to stimulate and support activities and daily life tasks.</p>	<p>Innovate UK</p> <p>May 13 – Apr 16</p> <p>£150,641</p>
<p>Speech therapy apps for rehabilitation</p> <p>Barnsley Hospital NHS Foundation Trust</p> <p>www.catch.org.uk/current-project/star/</p>	<p>Articulation therapy can help people with speech impairment improve their speech. It is however time-consuming, and patients rarely receive sufficient therapy to maximise their communication potential. This project will deliver novel computer-based articulation therapy, using apps for tablet computers which the patients can use to administer their own therapy.</p>	<p>NIHR</p> <p>Feb 15 – Jan 17</p> <p>£613,356</p>
<p>Standing frames as part of postural management for children with spasticity. What is the acceptability of a trial to determine the efficacy of standing frames?</p> <p>Newcastle University</p> <p>www.newcastle-hospitals.org.uk/staff-profiles/16966.aspx</p>	<p>The researchers will carry out two surveys and have discussions with children, parents and healthcare providers to prepare for a trial or trials of the effectiveness of standing frames to help children with cerebral palsy.</p>	<p>NIHR</p> <p>Oct 15 – Feb 18</p> <p>£253,395</p>
<p>STEMReader</p> <p>ECS Partners</p> <p>www.stemreader.org.uk/contact/</p>	<p>The project is developing STEMReader, a tool that will assist with reading aloud and comprehending mathematical symbols and notations.</p>	<p>BIS</p> <p>Nov 14 – May 16</p>

Project title, organisation, contact	Summary	Funding
<p>Technology enriched supported housing: a study into the lived experience of older people with dementia and their carers</p> <p>Ulster University</p> <p>www.ulster.ac.uk/staff/s.martin.html</p>	<p>This research is exploring the lived experience of people with dementia, and their carers when a technology enriched supported housing model is the living option of choice.</p>	<p>PHA</p> <p>14 – 17</p> <p>£385,490</p>
<p>Telehealth for COPD</p> <p>University of Oxford</p> <p>www.ibmex.ox.ac.uk/contact</p>	<p>The project, jointly funded with the Wellcome Trust, found that home based, unassisted, daily use of the mobile telehealth based application is feasible and acceptable to people with COPD for reporting daily symptoms and medicine use, and to measure physiological variables such as pulse rate and oxygen saturation.</p>	<p>DH</p> <p>Jun 12 – May 15</p>
<p>Telehealth in motor neurone disease</p> <p>University of Sheffield</p> <p>http://sitran.org/clinical-studies/telemedicine</p>	<p>A handheld telehealth device has been developed which enables patients with motor neurone disease to be monitored from their homes in order to provide specialist care when it is required. A pilot study is being undertaken to learn how a larger trial could evaluate the clinical and cost-effectiveness of this telehealth system.</p>	<p>NIHR</p> <p>Mar 14 – Feb 17</p> <p>£303,390</p>
<p>Towards bespoke bio-hybrid prosthesis: manufacturing bio-inductive interfaces in 3D</p> <p>Loughborough University</p> <p>www.lboro.ac.uk/departments/mechman/staff/russell-harris.html</p>	<p>The researchers envisage a prosthesis that will respond to biological feedback via a tissue engineered abiotic/biotic conduit between the artificial prosthetic and remaining biological muscle and nerves.</p>	<p>EPSRC</p> <p>Dec 14 – Jun 18</p> <p>£785,827</p>
<p>Towards visually-driven speech enhancement for cognitively-inspired multi-modal hearing-aid devices</p> <p>University of Stirling</p> <p>www.cs.stir.ac.uk/~ahu/</p>	<p>This project aims to develop a new generation of hearing aid technology that extracts speech from noise by using a camera to see what the talker is saying. The wearer of the device will be able to focus their hearing on a target talker and the device will filter out competing sound.</p>	<p>EPSRC</p> <p>Oct 15 – Sep 18</p> <p>£418,262</p>

Annex: Listing of assistive technology research and development projects 2015-16

Project title, organisation, contact	Summary	Funding
<p>TRUMP: A Trusted Mobile Platform for the Self-Management of Chronic Illness in Rural Areas University of Aberdeen www.abdn.ac.uk/staffnet/profiles/p.edwards</p>	<p>The project has explored the potential of mobile technologies in the development of a platform to support chronic disease management by simultaneously considering the needs of rural areas of India and the UK.</p>	<p>EPSRC Jan 12 – Jan 16 £1,684,860</p>
<p>Trustworthy robotic assistants Universities of Bristol, Hertfordshire, Liverpool, and the West of England http://robosafe.org/</p>	<p>The researchers are investigating how robotic assistants can be proven to be safe within the home environment.</p>	<p>EPSRC Mar 13 – Oct 16 £1,200,701</p>
<p>Upright, stylish mobility scooter Q2C</p>	<p>Proof of market award for an upright mobility scooter at a target price of £1,000-2,000, capable of storage and transport in a car boot.</p>	<p>Innovate UK Aug 15 – Nov 15 £25,000</p>
<p>WE ARE ABLE: displays and play University of Central Lancashire http://weareable.org.uk/contact/</p>	<p>The project aims to investigate whether wearable displays can assist children with autism and children with visual impairment when playing with other children. Findings of a participatory design activity have been published: http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7332699</p>	<p>EPSRC Sep 14 – Sep 16 £90,586</p>
<p>Wearable assistive materials University College London www.cege.ucl.ac.uk/arg/WAM/Pages/WAM.aspx</p>	<p>The research developed concepts for an exoskeleton to support people to walk unaided, and looking at materials and techniques that might improve the design.</p>	<p>EPSRC Mar 13 – Feb 16 £994,066</p>
<p>Wearable soft robotics for independent living University of Bristol www.bris.ac.uk/engineering/people/jonathan-m-rossiter/overview.html</p>	<p>The research team will develop soft robotic clothing to enable those with mobility impairments, disabilities and age-related weakness to move easily and unaided and to live independently and with dignity.</p>	<p>EPSRC Jul 15 – Jun 18 £2,026,740</p>

Research and development work relating to assistive technology

Project title, organisation, contact	Summary	Funding
<p>Year Zero Illumina Digital www.digitallifesciences.co.uk/year-zero/</p>	<p>Year Zero has been supported as part of the dallas programme to deliver telehealth, telecare and assisted living at scale. The project has created a suite of innovative digital services and apps supported by, or interacting with, an individual's personal health record.</p>	<p>Innovate UK Jun 12 – May 15 £2,916,190</p>