

# ***“Opportunities in Medtech Innovation: Neurological Conditions”***

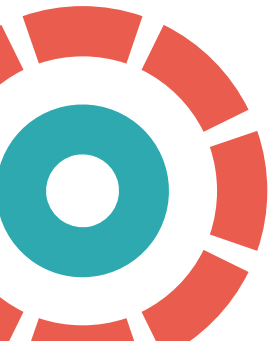
***Thursday 9<sup>th</sup> July***

***Hosted in collaboration between Medilink East Midlands & NIHR  
Devices for Dignity (D4D) MedTech Cooperative***

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## *Panel*

Professor Chris McDermott – “*The burden of neurological disease*”

Pamela Goff – “*Parkinson’s - where could technology make a difference?*”

Philip Morris – “*Design from the user perspective – the good, the bad, and how could it be better?*”

Philippa Hedley-Takhar – “*How can Devices for Dignity support product innovation?*”

Followed by **Q&A** – submit your questions & there will be opportunity for the panel to respond after the presentations



***“The burden of neurological disease”***

***Prof Chris McDermott***

***Professor of Translational Neurology – University of  
Sheffield***

***Consultant Neurologist – Sheffield Teaching Hospitals NHS  
Foundation Trust  
NIHR Devices for Dignity***

***@profcmcdermott***

***#Devices4Dignity***



**Total number of neurological cases in England has now reached 16.5 million (75k cases per CCG)**  
(Neurological Alliance, 2019)

**People with neurological conditions have the lowest health related quality of life of any long-term condition**  
(NHS England, 2019)

**£750m spent on urgent and emergency care including admission to hospital (increase by 3.6% in emergency admissions year on year )**  
(NIHR CLAHRC, 2018)

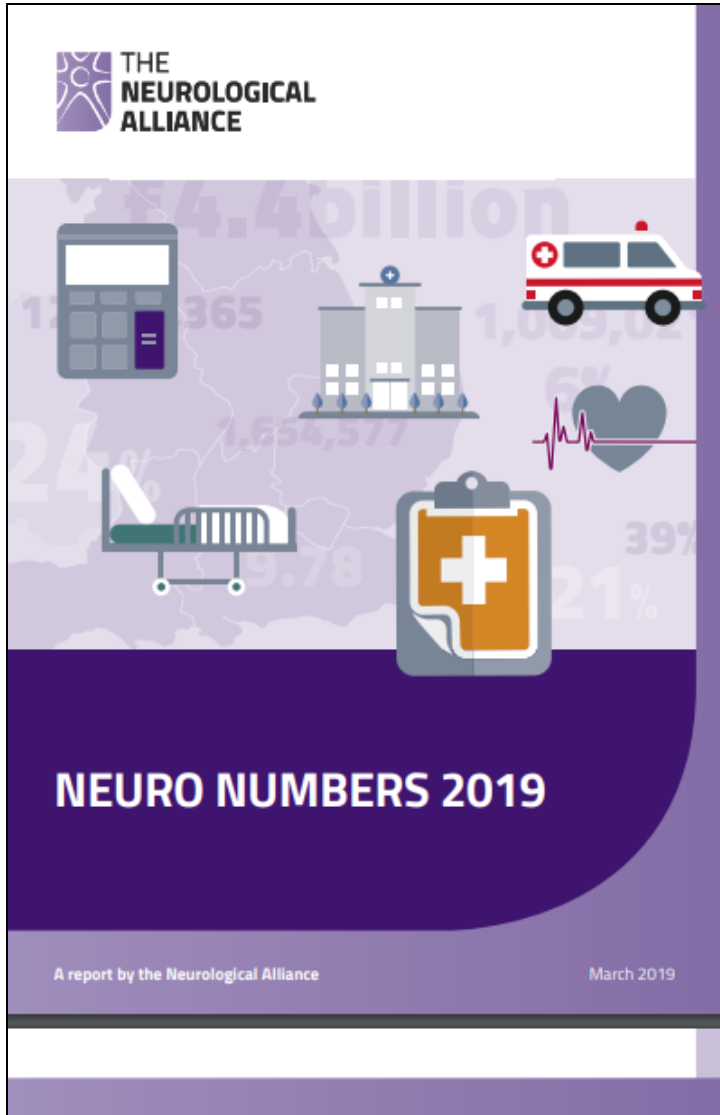
**NHS estimated spend >£4.4B & 14% social care budget**  
(DoH data, 2014 reported in Neurological Alliance, Neuro Numbers 2019)

**Impact of neurological condition on quality of life - 46% affected to a great extent, 35% to a moderate extent.**  
(Neurological Alliance, Patient Experience Survey 2019)

**Impact on daily living activities - 42% affected to a great extent, 36% affected to a moderate extent.**  
(Neurological Alliance, Patient Experience Survey 2019)

Neurological conditions can be grouped into four types:

- **Sudden onset** – includes stroke, traumatic brain or spinal injury, meningitis, Guillain-Barre Syndrome
- **Intermittent** – includes epilepsy, migraine, cavernoma
- **Stable with changing needs** – includes Tourette syndrome, narcolepsy, fibromyalgia, transverse myelitis
- **Progressive** – includes Parkinson's Disease, Huntington's Disease, Motor Neurone Disease (MND), Multiple Sclerosis (MS)



Condition	No. in UK 2020	New diagnoses per year	Age at diagnosis	Source
Parkinson's Disease	144,900	18,000	1.2% <50 yrs	Parkinson's UK
Multiple Sclerosis	130,000	6,700	Mostly between 20 – 50 years	MS Society UK
Huntington's Disease	6,700 in England and Wales	Estimated 2,000 per year	Mean age of diagnosis is 52.	Huntington's Disease Association
Stroke	1.2 M stroke survivors	57,000 (first stroke)		Gov.uk
Brain Injury	1M people living with the long term effects of brain injury	Approx. 200,000 admitted to hospital each year with brain injury (20% evidence of brain damage)		Headway

***“Over 80% of people with MND will have communication difficulties – for some, a complete loss of voice” (MND Association, 2020)***

***“A third of stroke survivors suffer depression after suffering a stroke” (Stroke Association, 2018)***

***“ 3 out of 5 people feel lonely as a result of their MS” (MS Society, MyNeeds survey 2019)***

***“limited availability of neuro-specialist rehab and reablement and a lack of psycho-social support” (Right Care 2019)***







**Sudden onset (e.g. stroke  
recovery variable 10%  
complete recovery; 25%  
some impairment; 40%  
moderate-severe  
impairment)**

**Gradual progression  
(e.g. Parkinson's (20  
years), Huntington's (15  
years)) / Intermittent /  
Stable**

**Rapid progression  
(e.g. MND (2-5  
years))**

**Interaction  
with health &  
care & self-  
management**

**Interaction  
with health &  
care & self-  
management**

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management**

**Activities of  
Daily Living**

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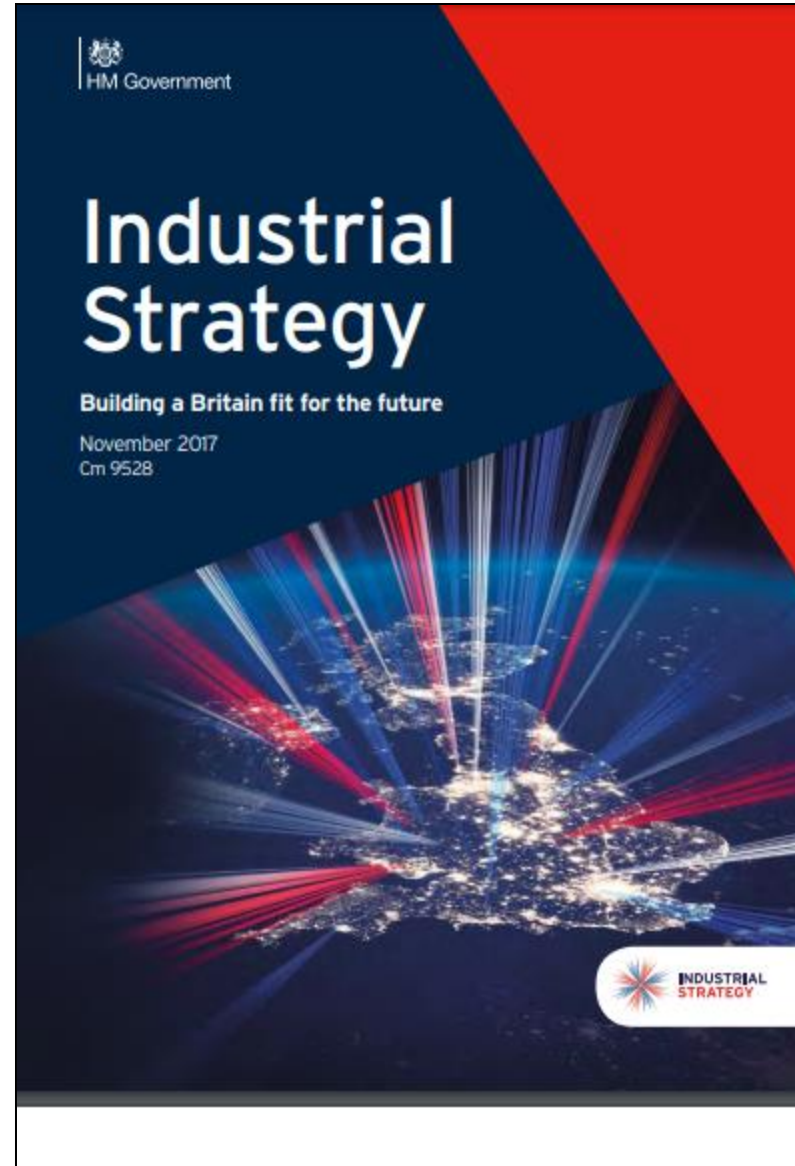
**Activities of  
Daily Living**

**Wellbeing /  
Thriving /  
Living Life**

**Wellbeing /  
Thriving /  
Living Life**

**Wellbeing /  
Thriving /  
Living Life**

***“innovation in products and services can make a significant difference to UK productivity and individuals’ wellbeing “***



## ***We asked... “Where could technology be part of the solution?”***

What if....

### **Health & Care**

- Information regarding diagnosis could be better recorded & shared to support commissioning?

### **Daily Living Activities**

- care coordination could be improved for individuals across organisational boundaries?
- self-management and self-care could be optimised for individual’s specific needs? E.g. more information about good and bad days?

### **Wellbeing / Travel / Hobbies**

- immediate feedback/support could be provided from specialists to support individuals and their paid / unpaid carers?
- access to specialists and community rehabilitation could be improved regardless of geography?
- telehealth solutions were accessible for all users, regardless of communication difficulties?

## ***We asked...“Where could technology be part of the solution?”***

What if....

### **Health & Care**

- technology could reduce the frustration of being unable to do those everyday ‘little things’?

### **Daily Living Activities**

- dignity and independence could be maintained for eating, drinking, dressing? (e.g. supported arm function)
- people were supported to stay in work longer whilst living with a neurological condition?

### **Wellbeing / Travel / Hobbies**

- users’ pride or confidence were not impacted by the use of balance or mobility aids and devices?
- assistive technologies did not adversely affect what people could wear or where they could go?
- technologies could be adapted / personalised to meet needs across a range of user aspirations, lifestyles, age groups, and contexts?

## *We asked... “Where could technology be part of the solution?”*

What if...

### Health & Care

- there were better ways of facilitating physical activity and exercise e.g. working with the fitness industry or voluntary sector?

### Daily Living Activities

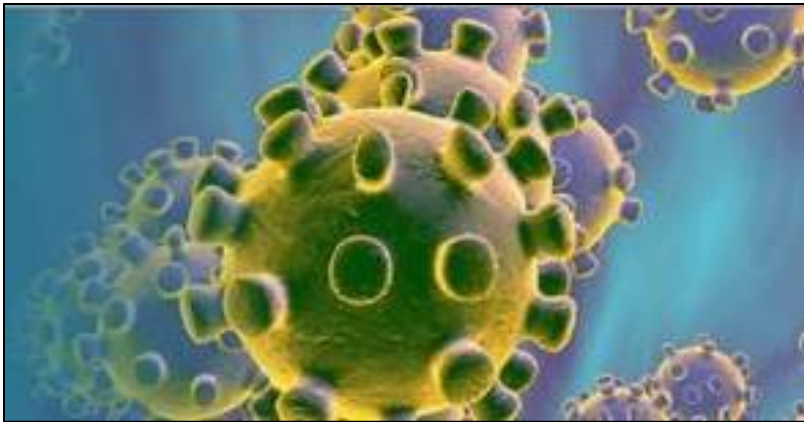
- individuals could better monitor the impact and benefits of their exercise activity to support their own self-knowledge and to share with their care teams ?

### Wellbeing / Travel / Hobbies

- community and social spaces were designed to facilitate participation in hobbies and social activities?
- communication aids were smarter, quicker and context-specific?
- it was easier for somebody with impaired mobility to travel for holidays or visit friends?



## ***Impact of COVID-19***



- Reduction in routine care, specialist rehabilitation & outpatients
- Concern about being 'deprioritised' for care over the long-term due to new cases
- Reluctance to seek urgent & emergency care due to risk
- Carer resilience
- Psychological impact
- Significant % severe C-19 cases have neurological symptoms incl. increased risk of stroke & functional neurological problems

The need to move at speed has opened up the door for some digital solutions but are we moving too fast? Do we need to pause and think about who we are designing services for?

Are we designing with accessibility in mind?





*“Parkinson’s – where could  
technology make a difference?”*

*Pamela Goff*

*@auntypj*  
*#Devices4Dignity*



## ***A personal perspective...***

- 40 years working within the NHS – as a radiographer, departmental manager, and Trust Risk Manager
- Diagnosed with Parkinson's 11 years ago soon after retirement
- Actively involved in using my knowledge, experience & education by volunteering - e.g. member of the Patient Advisory Group for the NHS England Test Bed in Sheffield
- Chair of the Sheffield Branch of Parkinson's UK – supporting people with Parkinson's and their families/friends e.g. exercise classes and social events.
- **What have I learned?** When discussing the use of technology, I find that end users should engage in the “Art of Stating the Obvious” - it's well worth listening to!
- Surprised at how little some technology companies have previously engaged with end users before investing in developing products and services.





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## Notable Dates

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- 1817 James Parkinson wrote a paper on the shaking palsy
- 1967 Use of levodopa revolutionised treatment
- 1980s deep brain stimulation introduced



## Motor Symptoms

- Rigidity (stiffness)
- Slowness
- Resting tremor
- Postural instability



# Non Motor Symptoms

Apathy  
Bladder dysfunction  
Change in taste and smell  
Choking and swallowing difficulties  
Constipation  
Delusions  
Depression and anxiety  
Double vision  
Drooling  
Excessive daytime sleepiness  
Eye problems  
Fatigue  
Foot care problems

Hallucinations  
Impulse control disorders  
Insomnia  
Leg swelling  
Nausea and vomiting  
Orthostatic hypotension  
REM sleep disorder  
Restless leg syndrome  
Sexual dysfunction  
Speech and communications difficulties  
Uncontrolled loss of stool  
Unexplained changes in weight  
Unexplained pains

# Not all people with Parkinson's are the same

- There is no known cure.
- Most Parkinson's is idiopathic, a very small number carry a faulty gene.
- There is no test or imaging that defines the diagnosis. It is diagnosed by taking a thorough clinical history, observing signs and interpreting symptoms by a specialist.
- Many patients are upset by the diagnosis and bewildered by the process.
- The way in which someone receives the diagnosis will have an effect on their attitude and self management for the rest of their life.
- Not all PwP have all symptoms all of the time. Although the general pathway into the future will show deterioration there are many ups and downs from hour to hour and from person to person.
- Medication merely eases the motor symptoms. As time goes by it becomes less effective. It's effects are transient. So, medication **MUST BE TAKEN ON TIME.**

## Slowing the rate of deterioration

- Research shows that there is one way to slow down the rate of deterioration.....EXERCISE!!!
- ... and not just a walk in the park.
- 2 ½ hours per week , with raised heart rate(for younger people in early diagnosis) to seated exercise (when symptoms are more complex). Enhances balance, posture, speed and strength.



*“Design from the user perspective – the good, the bad, and how could it be better?”*

*Philip Morris*

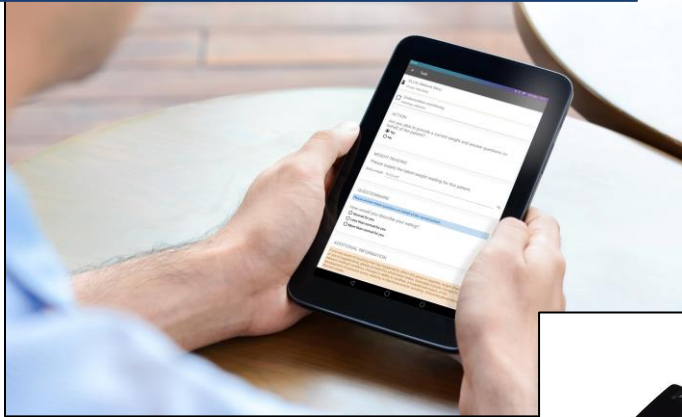
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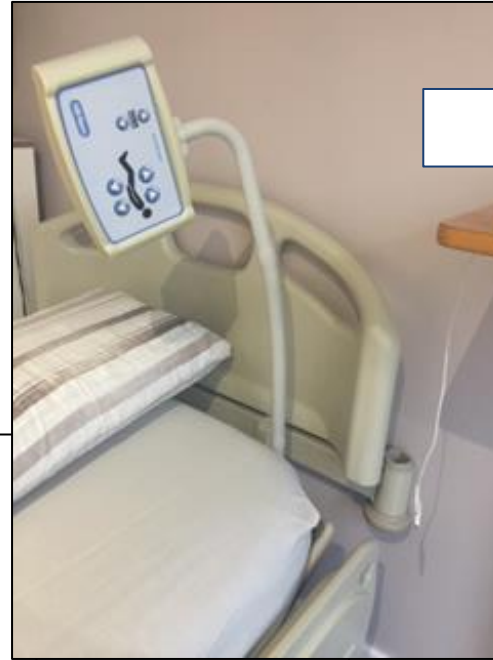


# *“What are your experiences of using technology in everyday life?”*

## Communication



## Bed Control



## Managing my health



## Devices in the home



## ***“What key things do you think technology designers and developers should think about?”***

- ☐ Technology development to involve users – we are the voice of **common sense!**
- ☐ For technology developers to think about **repurposing technology** to use it in a more diverse way for a range of different people that find themselves with different predicaments – for example could you use voice recognition technology in an app like Alexa as a better control for my bed?
- ☐ I’d like more technologies to fix **everyday problems** in my daily living
- ☐ I’d like technology developers to think about technology that large numbers of people will be able to use but also think about **personalisation**
- ☐ Think about devices and technologies that are unobtrusive that **look less like medical equipment** and more like a fashion or household item - for example like the devices being used to manage diabetes (like the wristband) or wearables for exercise



***“How can Devices for Dignity support product innovation?”***

***Philippa Hedley-Takhar***

***@piphedley  
@Devices4Dignity  
#Devices4Dignity***

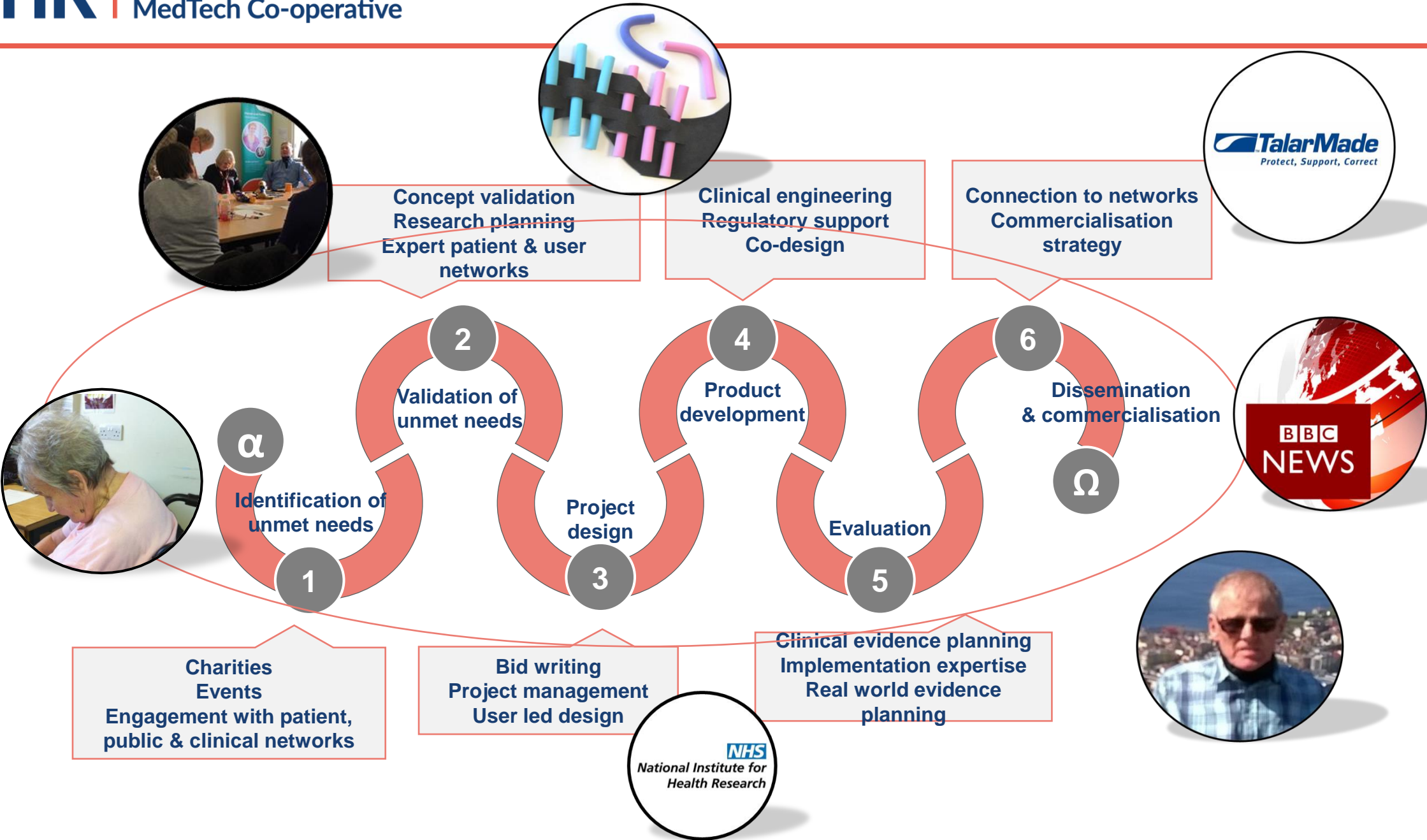












## *How we can help*



Consultancy  
(business,  
tech, clinical ...)



Concept  
validation



Regulatory  
expertise



Project  
management



Development  
strategy



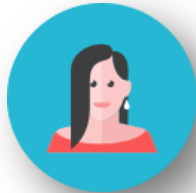
Route to  
market



Training



Access to  
clinical and  
expert networks



Patient  
and public  
involvement



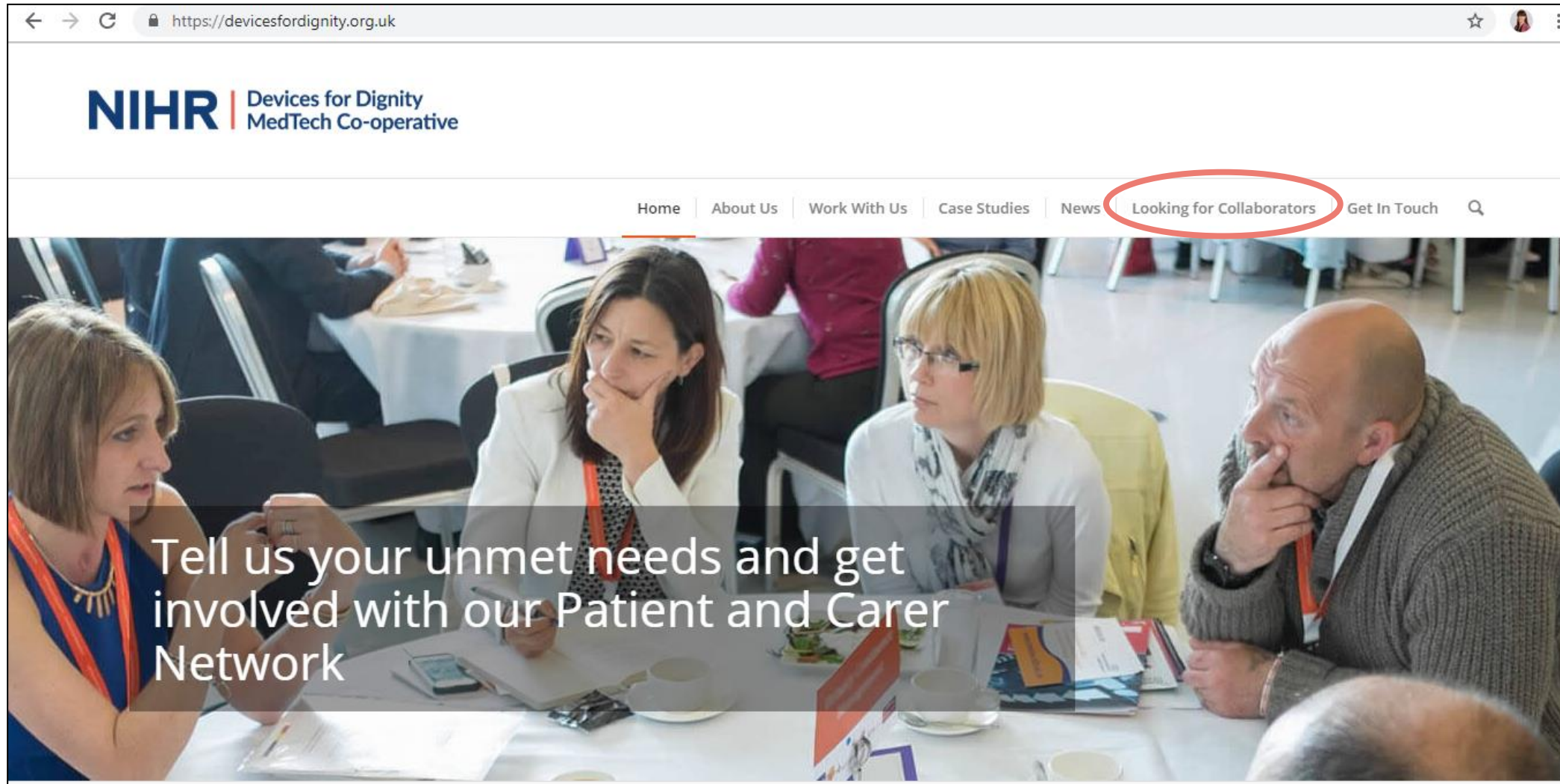
Technology  
evaluation



Writing  
funding  
proposals



Access to  
local, regional  
and national  
initiatives



## ***Funding Opportunities***

### **UKRI Open Call for R&I to address COVID-19**

<https://ktn-uk.co.uk/funding/ukri-open-call-for-research-and-innovation-ideas-to-address-covid-19>

### **INNOVATE SMART – opens August 2020**

<https://apply-for-innovation-funding.service.gov.uk/competition/515/overview>

### **NIHR Invention for Innovation (i4i)**

<https://www.nihr.ac.uk/explore-nihr/funding-programmes/invention-for-innovation.htm>

### **MedTech Navigator**

<https://www.medtechnavigator.co.uk/funding/>

### **Creative England**

<https://www.creativeengland.co.uk/creativegrowthfinance/>





## Q&A

**Contact NIHR Devices for Dignity at**

**[www.devicesfordignity.org.uk](http://www.devicesfordignity.org.uk)**

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