

# Finding the Gaps: The Development of the Brain Injury Unmet Need Directory

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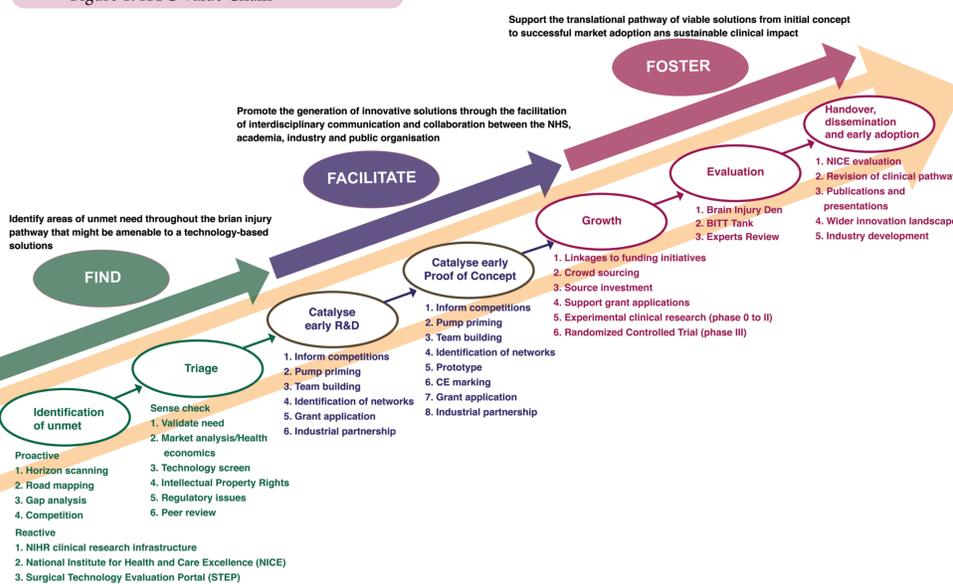
### BACKGROUND

Brain injury covers a wide variety of conditions for example; stroke, hypoxic brain injury and trauma, and is a leading cause of morbidity and mortality in the UK and worldwide (1). Traumatic Brain Injuries (TBI) alone result in approximately 1.4 million attendances to A+E in England and Wales each year and is the leading cause of death in the under 40s (2). Those that survive moderate or severe injuries often have long term disability which impacts upon their ability to participate within society, and leads to a considerable carer burden for families and society at large. Even so-called “mild” brain injuries are increasingly being seen as having negative outcomes (3).

### AIMS

To “Find” unmet needs that people and their families have after brain injury in order to aid development of technological solutions to them. To this end, HTC has iteratively developed the “Value Chain” (Figure 1.) to establish an enabling process infrastructure that will improve the readiness of technology solutions for NHS use.

Figure 1. HTC Value Chain



References

1. Rozenbeck et al. 2013
2. Lawrence et al. 2016
3. Carroll et al. 2014
4. Sutherland et al. 2015
5. Phaal et al. 2017
6. [http://www.brainiac.nihr.ac.uk/wp-content/uploads/2018/11/HTC\\_FIND-FACILITATE-FOSTER\\_V3.pdf](http://www.brainiac.nihr.ac.uk/wp-content/uploads/2018/11/HTC_FIND-FACILITATE-FOSTER_V3.pdf)
7. See handouts
8. Hamilton et al. 2017
9. Lane and Benoit 2011
10. Lebedev et al. 2011
11. Le and Gean 2009
12. Varkey et al. 2017
13. Brenner et al. 2007

### METHODOLOGY

5 Methodologies piloted:

#### 1. Horizon Scanning:

It is the systematic search for and the identification of significant or potentially significant long-term threats in a particular field (4), working with partners in and beyond the National Institute for Health Research.

#### 2. Roadmapping:

A technique developed for the car industry, it brings together people with a strategic level of knowledge around a specific area/problem (5). Each participant brings with them knowledge of a particularly problem which they present to the group in short “pitches”, using a pre-designed landscape to enable items to be placed in relation to pre-set criteria such as timescale. The participants then vote on these items resulting in the identification of priorities for further development.

#### 3. Gap Analysis:

By developing an understanding of the current state of brain injury care and looking to a desired state the gap between the two can be found.

#### 4. Competitions:

Specifically designed to elicit key priorities to improve outcomes for brain injury patients and their families and carers. The peer reviewed competitions took two form: “innovation led” through “seedcorn” project awards (6) funding was offered to innovators who could identify an evidence based unmet need.

Unmet needs were identified by patient, carers and their respective groups. These were further refined and with innovators, possible technical solutions were developed.

#### 5. Reactive Identification:

Creating the opportunity to raise public awareness of HTC supported-projects amongst relevant external bodies and key stakeholders with the view to include their organisations evidence-based unmet needs in the HTC directory (7).

### RESULTS: Needs

70

The number of unmet needs identified through the applied methodologies

15

The number of unmet needs removed through validation with patients and carers

55

The total remaining unmet needs 922 further reviewed by patients and carers; with 9 accepted and 12 reworked

### RESULTS: Themes

Patients and families after brain injury value consistent high quality information (8). The development and implementation of technologies focused on communication would optimise the experience of patients and their families.

The development of specific technologies is needed to solve specific problems in sphere of brain injury (9). Many will require development of sophisticated technologies (10). However, others may be patient specific and may not be financially viable on a large scale.

#### Communication

#### Technological Development

#### System Optimisation

#### Knowledge Building

Through optimising and standardising access to, and use existing technologies, patient can improve (11). Systems that continually drive quality and technological improvement also need development if progress is to continue (12).

There continues to be a lack of knowledge around brain injury (3). The development of a deeper understanding around all aspects of brain injury is needed (13).

### CONCLUSIONS

Of the 5 methods piloted, 2 went on to provide items for inclusion in the final HTC Directory. Technology shows considerable promise when it comes to improving the lives of people after brain injury. While some needs will be solved by the development of specific technologies, others will require the creation and implementation of systems and best practice guidelines.

### FUTURE STEPS: Matching MedTech with Unmet Needs

