Clinicians’ views of remote measurement technology in practice: Towards a value proposition for RADAR-CNS

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Introduction
Central nervous system (CNS) disorders cause significant disability across Europe. The central nervous system controls movement, behaviour and neural processes, and there is thus great potential to monitor symptoms of conditions affecting the central nervous system through the use of sensor technologies worn on the body or contained within mobile phones.

RADAR-CNS (Remote Assessment of Disease and Relapse) is a system which takes input data from wearable technologies including Fitbits, heart rate monitors, gait monitors and bespoke mobile phone applications to remotely collect data from patients. The RADAR-CNS project focuses on exploring the potential of this system in three CNS conditions: depression, multiple sclerosis (MS) and epilepsy.

At the University of Nottingham, we are seeking to understand where, when and how data from these technologies could be of greatest benefit for patients’ overall care. To do so, we are undertaking a programme of work involving pathway analysis, surveys and interviews.

Analysis of clinical pathways
Clinical pathways are a useful way to understand healthcare provision processes and clinical decision points.

In the initial stages of our work, we conducted a literature review on clinical pathways and analysed the guidelines produced by the UK’s National Institute for Health and Care Excellence (NICE) for the care of epilepsy, MS and depression.

Through this analysis, we identified candidate points in care pathways where RADAR-CNS may provide benefit, for further exploration. An example is provided below.

Survey of clinicians within the RADAR-CNS consortium
We used a use-case scenario methodology to elicit 21 healthcare professionals’ views on the potential value of the RADAR-CNS system in epilepsy, MS and depression. Participants were part of the RADAR-CNS consortium and were familiar with the project.

The survey asked respondents to write a short description of how patients’ care would be managed:
1. before the introduction of RADAR-CNS
2. after the introduction of RADAR-CNS

Survey of clinicians external to RADAR-CNS
We are also recruiting to a survey of healthcare professionals external to the RADAR-CNS project, to understand how remote measurement technologies might impact pathways and decision points from their perspective. Findings are not yet available, as recruitment is still underway. Areas of enquiry include:

- Tracking adherence to medicines and outcomes, with potential to improve efficacy.
- Understanding health at the population level.
- Developing innovative reimbursement schemes.
- Capturing behavioural needs of patients to inform improvements to label text, instructions for use and management of side effects.

Survey of pharmaceutical company representatives
We are working with pharmaceutical partners associated with the European Federation of Pharmaceutical Industries and Associations (EFPIA), with the aim of incorporating a pharmaceutical industry perspective in the development of a value proposition for RADAR-CNS.

We conducted a survey of our pharmaceutical industry partners to understand their perspectives on the potential benefits of remote monitoring technologies in CNS disorders. Respondents suggested RADAR-CNS could have a role in:

- Facilitating the collection of data which would enable recognition of early warning signs of relapse
- Gathering data on seizure precipitants
- Enabling more objective measures of depression
- Measuring changes in mobility and job roles of those most likely to manage them

Survey of healthcare professionals
We have also conducted interviews with 26 healthcare professionals involved in the care of people with one or more of the three conditions, to explore in depth if and how clinicians envisage remote measurement systems changing future care.

Themes emerging from the thematic analysis were:

- Potential value of RMT data
- Clinician roles making use of data
- Obstacles to successful uptake
- Empowering patients

Survey results, comparing clinician and pharmaceutical company perspectives on the potential of RADAR-CNS as a system of remote measurement in clinical pathways for epilepsy, MS and depression.

Our next steps involve analysing external survey results, comparing clinician and patient points of view, and developing a value proposition for the RADAR-CNS system.

Further work is required to understand the potential use of stratified RMT data across patients to assess risk/identify trends, and how RMTs might facilitate patient autonomy.

Conclusions
We are using surveys and interviews to explore clinician and pharmaceutical company perspectives on the potential of RADAR-CNS as a system of remote measurement in clinical pathways for epilepsy, MS and depression.

RADAR-CNS holds potential for detecting relapse and enabling more objective measurements which are not currently possible to collect, e.g.:

- Epilepsy: detecting and recording types of seizure and times of occurrence
- MS: measuring changes in mobility and cognition
- Depression: using fitbits to measure sleep and activity to predict new episodes of illness

Benefits are also perceived within pharmaceutical R&D.

Our interviews showed health professionals were confident they could use data from RADAR-CNS at multiple points in care pathways, especially if the platform was compatible with patient records and featured visualisations of data. However, all confirmed that face to face appointments would still be necessary. Nurses were highlighted as having close relationships with patients and are therefore well placed to manage RMT data.

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