DISSERTATION PROPOSAL

Counting the costs of computer problems

A study of computer-related problems in clinical practice and the barriers to fixing them

Candidate identifier: TMPC1

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1 Research Governance Statement

This study will be conducted according to the Research Governance Framework (Second Edition April 2005) and according to the Principals of Good Clinical Practice (GCP) and in accordance with the declaration of Helsinki.

This study protocol does not require ethical approval from the NHS research ethics committee because it represents a service evaluation and development exercise.

2 Key Project staff & Signatures

Name	**Role & Affiliation**
NAME	Project lead, Health Informatics MSc student at University College London
NAME	Supervisor, Reader in Health Informatics, University College London

3 Background

Computer problems, for example the computer or printer freezing and needing to be turned off and back on, are common in the clinical workplace and interrupt workflows. Such interruptions waste clinical time and cause considerable frustration(Magrabi et al., 2010). Worse, it is recognized that interruptions may threaten the delivery of safe high quality clinical care(Caldwell, 2011; Westbrook et al., 2010; Hickam et al., 2003).

Caldwell (2011) describes how the modern ward round is dependent on timely access to computer information and how a change of computer lock out policy, which caused more frequent rebooting to be required, led to a marked increase in the average duration of routine ward rounds at his hospital. He also explores the tension between written and non-written IT operational policies and the delivery of timely, safe, health care from a clinical perspective. However, no attempt is made to explore perceived barriers to change from professional health IT and managerial perspectives.

Increases in the time of task due to computer problems may be problematic directly by being a form of interruption in themselves or indirectly by increasing the likelihood that an

external interruption will occur.

Westbrook et al. (2010) report on a prospective observational time and motion study of emergency doctors to measure the association between emergency doctors rates of interruption and task completion times and rates. In their study they observed that doctors were interrupted 6.6 times per hour and failed to return to 18.5% (95% CI 15.9% to 21.1%) of interrupted tasks. Hickam et al. (2003) carried out a literature review of existing evidence on the aspects of the working environment that impact on patient safety and found strong evidence for work flow design, including frequency of interruptions and distractions, affecting patient safety.

Grol & Grimshaw (2003) identify three broad groups of barriers to implementing change in clinical practice as organizational, social, and professional, and recommend that change interventions consider these barriers. However, Baker et al. (2010) recently carried out a review of the evidence for tailored interventions to overcome identified barriers to change in healthcare and concluded that whilst interventions tailored to prospectively identified barriers may improve care and patient outcomes there is not yet statistically significant evidence that is the case.

4 Rationale

The uptime, that is the amount of time in a ready-to-use state, of computers and printers is not currently routinely measured. The barriers to making changes that would result in greater uptime are unknown. Establishing the frequency and nature of computer problems in a sample clinical workplace will allow estimation of the magnitude of the problem and may help to build a case for change. Investigating the barriers to change will identify important considerations for those wishing to make change.

4.1 Study Aims and Objectives

The main research question is: What is the time burden of computer problems experienced by clinicians during routine clinical practice on an acute admissions unit?

4.2 Aims

The aims of this study are:

1. To establish the frequency and nature of computer problems encountered in routine clinical practice

2. To investigate the barriers to implementing changes that would address computer problems

4.3 Objectives

1. To establish the frequency and nature of computer problems encountered during ward rounds on an acute admissions unit

2. To establish the frequency and nature of computer problems encountered by junior (i.e non-consultant) doctors carrying out their work during on the acute admissions unit

3. To explore the views of doctors, hospital IT professionals, and managers, with respect to the barriers to implementing changes that would address computer problems

5 Methods

5.1 Setting

This study will take place on the acute admissions unit of an acute foundation trust hospital. Acute admissions units are short stay wards (usually 24-76 hours) that receive medical and surgical patients referrals from A&E, GPs, and hospital doctor outpatient clinics.

This hospital will very likely be Chelsea and Westminster. Participants will be recruited from the acute admissions unit medical team which comprises one consultant, 2 registrars, 4 SHOs (F2, CT1, CT2), and 4 F1s (see appendix A for further details). The qualitative aspect of the study will also include participants from the hospital IT and management teams.

Quantitative, semi-quantitative, and qualitative approaches will be used.

5.2 Quantitative

It will be attempted to develop semi-automated quantitative measures of computer problems. Proposed measures include:

- Number of computer reboots per day

- Number of printer reboots per day
- Number of times printer has an out of paper error per day

Firstly, it will be attempted to obtain, collate, and analyse, individual log files from devices used on the Acute Admissions Unit. Secondly, since all of the computers and printers on the AAU are networked, the possibility of using a network device to interrogate computers and printers to establish their functional state and derive their uptime, will be explored.

5.3 Semi-quantitative

Using a clipboard, tally chart, and stopwatch, computer problems encountered during a ward round will be counted, timed, and described. The same process will be repeated over the course of a day spent following a junior (i.e non-consultant) doctor. The type of work being carried out will be recorded using work task definitions described by (Westbrook et al., 2010).

5.4 Qualitative

Sample script:

- Hello I'm NAME, I'm a ROLE carrying out a research project
- I'm interested in how the technology doctors use in the hospital, such as computers and printers, works for them.
- I'd like to record us discussing this. Would it be ok to have 5-10 minutes of your time to do this? Are you happy for me to record it?
- What do you think about the technology doctors use in hospital?
- How do you think anything could be better? What?
- What do you think is stopping things being made better?
- Thank-you for your time. Are you happy for me keep the recording to use for my research?

6 Method for analysis

Quantitative and semi-quantitative data will be presented using descriptive statistics. Semi-quantitative data will be used to estimate time costs of different types of computer problem. These estimates will then be combined with quantitative data to estimate the clinical time burden of computer problems for the AAU. Qualitative audio data will be transcribed and subjected to framework analysis using Atlas.ti software(Pope et al., 2000). Framework analysis will be independently repeated by another researcher, who is blind to the initial researchers coding, to permit inter-rater reliability.

7 Project Plan

7.1 Proposed Timeline

The project lead will carry out all work with the exception of the transcription of recorded audio and the framework analysis carried out by the second rater.

- December-January, literature review, identification of a suitable site
- February-March, field work
- April-August, framework analysis and write up

Appendix A - Details of medical team

At present the terminology used to refer to members of the medical team relates to the number of years since the year of qualification and is as follows:

- Year 1 - Foundation Programme Year 1 doctor (F1)
- Year 2 - Foundation Programme Year 2 doctor (F2/SHO)
- Year 3-4 - Speciality Trainee Year (1-2) doctor (ST1-2/SHO)
- Year 5-9 - Specialist Trainee Year (3-7) doctor (ST3-7/Registrar)
- Year 10+ - Consultant

References

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