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Clinical Handovers within the Emergency Care Pathway and the Potential for
Harm of Clinical Handover Failures

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Funder

SDO

Clinical Handovers within the Emergency Care Pathway and the Potential for Harm of Clinical Handover Failures

1. Aims/Objectives:

The project addresses the following Research Questions:

- R1: What is the potential for harm of clinical handover failures along the Emergency Care pathway?
- R2: What are common organisational deficiencies that affect clinical handover in the Emergency Care pathway and what impact does the organisational model of care delivery have?

The detailed objectives of the project are:

- O1-1: To identify and to systematically describe clinical handovers within the EC pathway
- O1-2: To assess the reliability of handovers within the EC pathway
- O1-3: To describe failure trajectories through the pathway and to systematically assess the potential for harm of handover failures
- O2-1: To identify common organisational deficiencies that affect clinical handover in the EC pathway
- O2-2: To describe the impact on handover of different organisational models of care delivery within the EC pathway
- O3-1: To provide recommendations for improving the reliability and quality of clinical handover in the EC pathway

Data will be gathered along Emergency Care pathways in three participating NHS health economies with different organisational models.

2. Background:

The project aims to contribute to the research on clinical handovers and patient safety in Emergency Care through the following specific contributions:

- Study of the Emergency Care pathway considering inter-organisational and inter-disciplinary handover rather than a single type of handover
- Systematic risk analysis and description of significant failure trajectories
- Qualitative analysis of the system and organisational factors contributing to failure.
- Consideration of the impact of different organisational models of the Emergency Care pathway by studying three health economies with different characteristics.
- Recommendations for sustainable improvement by consideration of pathway and underlying factors
- Contribution towards an organisational culture of proactive end-to-end patient safety risk management through the choice of methods which include traditional research methods as well as improvement science and safety science methods (Process mapping, Failure

Mode & Effects Analysis).

Literature review:

- Handover is a high-priority area: A recent Australian literature review concludes that clinical handover is a high-risk scenario for patient safety (Wong et al, 2008). In the US, the Joint Commission suggests that communication failures among clinicians are a major contributor to sentinel events and near-misses (WHO, 2007) and it requires from accredited organisations the adoption of standardised handover approaches (JCAHO, 2007). The World Health Organization Patient Safety Alliance High 5s initiative includes reduction in handover errors as one of its priorities (WHO)
- Handover around emergency care poses particular threats to patient safety: Handovers between ambulance services and emergency care, and handovers within emergency care, are characterised as being particularly problematic (Wong et al, 2008). This is due to the fact that emergency care has unique characteristics such as multiple and overlapping patient encounters, unscheduled care, incomplete historical data, and handover often takes place in settings of high patient acuity and overcrowding (Bomba & Prakash, 2005; Wilson, 2007)
- Few studies considering inter-organisational handover and emergency physician handover: A literature review on ambulance services to emergency department handover found only 8 studies relating to the topic (Bost et al, 2010). A paper on behalf of the American College of Emergency Physicians states that there is a lack of empirical evidence and that the study of handover in emergency care was still in its infancy (Cheung et al, 2009)
- Reliability of handover in emergency care: There is little systematic evidence as to the actual reliability and potential of harm of clinical handovers. A survey in three large metropolitan emergency care departments in Australia (Ye et al., 2007) employed post-handover questionnaires and found that information was perceived to be lacking in 15.4% of handovers. A study looking at handover between ambulance services and emergency department at two sites found that ED staff retained only 56.6% of the information correctly (Talbot & Bleetman, 2007).
- Our recently concluded WISER study looking at shift handover in three sites found that certain elements, such as tests awaiting results (18.1%), tests not done yet (16.7%) and ongoing treatment (16.7%) were communicated infrequently (Burnett et al, 2010).
- Contributory factors: The absence of a standard approach is frequently identified as a contributory factor along with factors such as lack of training in communication skills, missing or inaccurate information, time constraints and frequent interruptions (Ye et al, 2007; Bomba & Prakash, 2005; Philibert, 2009; Wong et al, 2008).
- Over-simplification of recommendations: Recommendations for improving handover frequently focus on standardisation. A recent literature review

concludes that at present there is no evidence that demonstrates that standardisation leads to a measureable improvement in patient outcomes (Cohen & Hilligoss, 2010). A recent editorial in the Annals of Emergency Medicine emphasises that this may be due to extreme over-simplification of the problem and a poor understanding of underlying contributory factors (Patterson & Wears, 2008). The editorial also points out that the scope was too narrow with looking at only one particular handover instead of the pathway.

3. Need:

This will be the first study that systematically studies handover failure in the emergency care pathway from a systems perspective. There is broad agreement in the literature as well as among relevant organisations (e.g. BMA, JCAHO, WHO etc) that clinical handovers represent a crucial element in patient care and that failures constitute considerable risks to patients. This is particularly true for the dynamic and time-critical Emergency Care pathway. NPSA data (per comm., 2010) shows that the commonest causes of adverse events in A&E departments relate to misdiagnosis and mistreatment. Both of these are known to be influenced by information handover. Organisations such as the American College of Emergency Physicians or the Health Foundation and the NHS Institute for Innovation & Improvement in the UK acknowledge that research on clinical handovers is required in order to ensure the continuity of care and reduce patient harm. The recent review of the patient safety research programme highlighted the needs for a systems focus, with its view of latent and upstream factors rather than the individual focus and that the admission process was an important area of research.

Clinical handovers are currently of even more interest due to changes in the working hours of doctors, which lead to an increased number in shift handovers. Various changes such as those in rotas becoming EWTD compliant have resulted in a large increase in handovers, often from one per day to 3 per day for medical handovers alone.

As outlined above, there is little systematic evidence about the reliability and potential harm of clinical handovers, in particular in the UK. In addition, the studies often consider a single handover and proposed improvements usually do not consider the wider systems aspects. Checklists are often suggested as the means of reducing error, occasionally changes of environment to stop interruptions have been suggested, but rarely has any study been made of the broader organisational issues that create the atmosphere and approach that supports better handover. Undertaking the research will also promote a research based discussion after results are released which will assist in modifying underlying root causes at individual locations as well as inducing change by more formal routes.

The proposed project looks at the Emergency Care pathway and provides descriptions of the risks of failures in clinical handovers along the pathway. The Health Foundation's Safer Clinical Systems programme, led by this team, has demonstrated wide variation on handover practice and has developed methodologies that will be utilised in this study to diagnose and analyse

handover problems. It considers the influence of the organisational setup of care delivery. It also provides a demonstration of how organisations can assess risks proactively.

4. Methods:

The project will employ a multi-disciplinary mixed-methods approach consisting of both quantitative and qualitative research methods as well as methods drawn from safety and improvement science. The team includes individuals with clinical, human factors and safety engineering, improvement science and organisational behaviour backgrounds.

a. Setting

The project investigates handovers along the Emergency Care pathway, including the interfaces into and out of the Emergency Department (e.g. Ambulance Services, ward-based care). The three sites selected have been chosen because of their diversity. They differ in size of organisation, and include foundation and ordinary NHS trusts with a geographical spread. The communities they serve are very different including metropolitan, urban and rural with both multi-cultural and near uni-cultural populations. The styles of emergency care practised also differ with departments having many emergency medicine consultants and undertaking many investigations and treatments in the emergency department to small departments with few consultants where most investigation is undertaken by the admitting teams. The study also involves three different ambulance services with whom we have worked previously. The choice of study sites reflects common NHS Emergency Care pathways that a patient may encounter. By choosing diverse sites, the study will provide descriptions of the impact on handover of different models of Emergency Care, while at the same time providing a basis for drawing out common organisational deficiencies across sites. Focusing on three sites, represents a reasonable compromise with respect to cost and effort required and strength of the findings.

b. Design

The research is organised into three work streams as outlined below in detail.

WP1 looks at the entire Emergency Care pathway including the interfaces into and out of the Emergency Care department to identify the main vulnerabilities and opportunities for harm associated with handover failures. This includes handover from Ambulance Services to A&E and from A&E to MAU (where the majority of patients requiring medical admission go). The handovers studied are related to progression along the pathway rather than shift handover. Handovers include a range of variables such as format, existence of guidance and checklists, urgency, environment and professional groups to ensure that systems issues are detected. We use improvement science methods, such as process walks and process mapping, to describe the pathway and the handovers along the pathway. There will be an element of quantitative data collection through observations and audio recording of handover in order to determine the reliability of handover. Data will be analysed using Communication Analysis and a tool developed for the assessment of handover

(Apker et al, 2010). From safety science, we adopt a technique called Failure Mode & Effects Analysis (FMEA) to elicit proactively from staff their perceptions about vulnerabilities in the system and possible trajectories of handover failures through the system and its safety defences. WP1 will, therefore, provide a rich description of the Emergency Care pathway and the handovers, as well as a systematic and contextualised description of the major risks associated with handover failures, their possible causes and promising safety improvements.

WP2 looks at organisational factors that affect the quality of handover. This work stream utilises qualitative research methods based on the Grounded Theory approach (Strauss & Corbin, 1998). The interviews with staff will be coded and common organisational deficiencies identified through constant comparison with the data and theoretical comparison with the literature (e.g. Reason, 1997; Vincent et al, 1998). This work stream will also look at the differences between the sites in terms of their geography, patient population, Emergency Care pathway structure etc and elicit from staff their perceptions about how these differences affect handover and the impact of handover failures on patient safety. WP2 will provide a qualitative description of common organisational deficiencies and a qualitative assessment of the impact of different ways of structurally organising the Emergency Care pathway. Our overall aim remains to examine how far day to day organisational factors may contribute to any deficiencies observed in the handover process. These are of course not designed to be inadequate but can occur as a consequence of embedded, well established work practices often acquired by role incumbents as part of the role socialisation process. Some authors (Bate 2000, Ham et al 2003, Waring et al 2007, Skipton et al 2008) would refer to such behaviour as reflecting the cultural practices of an organisation, indeed the safety culture of the organisation. It is not our intention to examine and assess factors by formal survey - relevant assessment tools exist - but through interviews and discussion with staff directly involved identify whether such cultural factors may be operating.

Our focus is initially the potential for organisational issues to shed light on deficiencies in handover. On a more positive note we would want the study to contribute to how change or improvement in practice might be achieved. In this sense we would wish to explore, albeit at a limited level given the scope of the study, how far the knowledge of behavioural implications can be captured and disseminated more widely within the whole organisation (Swan, Newell and Scarbrough, 2008). It may be difficult to generalise to the entire NHS from findings in three key hospitals, however we would hope to identify aspects of organisational practice (which may of course be site specific) which may influence handover practice and may be operating similarly in other contexts.

WP3 synthesises, summarises and prioritises the findings of the previous work streams to provide recommendations from a systems perspective to policy makers and managers for sustainable improvements of clinical handover within the Emergency Care pathway. The recommendations will be commented upon independently by an individual with expertise in NHS finances to provide an indication of the feasibility within the current NHS

climate of the different recommendations. The recommendations will be documented in the final project report.

c. Methods

WP 1: Potential for harm of clinical handover failures along the Emergency Care pathway (Lead: Prof Matthew Cooke; 8 months)

This work package will:

- describe the Emergency Care pathway and handovers at each site (WP 1.1; 3 months)
- quantitatively assess the reliability of handovers (WP 1.2; 3 months)
- systematically assess the potential for harm of handover failures and describe significant failure trajectories (WP 1.3; 2 months).

Methods:

The main methods used are:

- WP 1.1: Process Walks, Process Mapping
- WP 1.2: Observation and audio-recording of handover; post-handover questionnaire
- WP 1.3: Failure Modes & Effects Analysis, Focus Group

Outputs:

- WP 1.1: Process map detailing handovers along the EC pathway; structured description of each handover
- WP 1.2: Reliability measure for each type of handover
- WP 1.3: Systematic risk analysis (FMEA template)

WP 2: Common organisational deficiencies and the impact of organisational models of care delivery (Lead: Prof. Peter Spurgeon; 6 months)

This work package will:

- identify and classify the main organisational deficiencies that impact the quality of handover (WP 2.1; 3 months)
- describe the impact of organisational models of care delivery on handover (WP 2.2; 3 months)

Methods:

The main methods used are:

- WP 2.1: Semi-structured interviews
- WP 2.2: Comparative qualitative analysis

Outputs:

- Qualitative description of common organisational deficiencies as perceived by staff
- Qualitative description of structural differences between sites and their impact on handover

WP 3: Recommendation for improving the reliability and quality of handover (Lead: Dr Mark-Alexander Sujan; 1 month)

This work package will bring together in a final report the findings of the previous work and provide recommendations for enhancing the reliability and quality of handover from a system's perspective. The recommendations will be commented upon by an individual with expertise in NHS finances with a view to their feasibility within the current NHS climate.

5. Contribution to existing research:

This proposal is highly relevant to the present SDO agenda in that it addresses an important topic in an area not previously explored. Patient safety is considered a national priority and various initiatives are in place to reduce risk and harm, but currently this work has not included non shift related handovers or the special circumstances of the emergency care pathway.

It will build on previous research on patient safety and reliability. Most existing research has looked at handover between shifts and primarily with ward based teams. This research will extend that work to the emergency care setting and to inter-organisational, inter-departmental and inter-professional handover. It will have high impact on the 13 million emergency department attendances per year.

This project will ensure that the profile and importance of handovers is heightened in Ambulance Services, Emergency Departments and Assessment Units. Existing links with the NHS Institute, Health Foundation and Patient Safety First campaign will ensure that the findings are widely applied and consideration is given to the generalisable findings for other pathways. MWC will have the opportunity to link the findings with policy development and to have access to a wide emergency care audience. The findings will also be placed on NHS Evidence emergency and urgent care collection (managed by us) and included in their briefing series.

A copy of the final project report will be sent to the INVOLVE registry and key findings communicated to the public via The University of Warwick's very successful media office.

One of the stated objectives of the NIHR is that “research is needed to identify the most effective, value-for-money interventions and to ensure these are implemented quickly”. The intended output of this project would provide information required to reduce handover errors and improve safety in a sustainable manner because of the systems focus. The previous work of the group allows this project to use established and tested methods increasing the cost effectiveness. The systems focus of this work is highly relevant to managers as well as clinicians and it is expected that many of the latent conditions detected in the study will be implicated in many safety errors not just those of handovers.

6. Plan of Investigation:

| Work Package | Start | Complete by (latest) | Deliverables | Staff |
|--|--|----------------------|--|--|
| Project Management Objective: Provide ongoing project management; set up project web site; prepare interim and final reports | 01/04/11 | 30/09/12 | | MAS, MWC, PS, Project Manager |
| WP 0 – Ethics Objective: Finalise research protocol & obtain ethics approval | Following positive indication of funding, no later than 01/04/11 | 30/06/11 | Research Protocol Ethics approval | MAS, MWC, PS, Project Manager |
| WP 1 – Potential for harm of clinical handover failures Objective: <ol style="list-style-type: none"> O1-1: To identify and to systematically describe clinical handovers within the EC pathway O1-2: To assess the reliability of handovers within the EC pathway O1-3: To describe failure trajectories through the pathway and to systematically assess the potential for harm of handover failures | 01/07/11 | 28/02/12 | | MAS, MWC (WP Leader) , MIK, SC, NR, Researcher |
| WP 1-1: Description of pathways & handovers Process walks, process mapping sessions | 01/07/11 | 30/09/11 | Process map for each site Structured description of each handover | MAS, MWC, MIK, SC, NR, Researcher |
| WP 1-2: Quantitative reliability assessment | 01/10/11 | 31/12/11 | Reliability assessment report for each site | MAS, MWC, MIK, SC, Researcher |

| | | | | |
|---|----------|----------|--|-------------------------------|
| Collect quantitative data for 3 handovers at each site | | | | |
| Conduct data analysis | | | | |
| Produce reliability assessment report | | | | |
| WP 1-3: Potential for harm & failure trajectories | 01/01/12 | 28/02/12 | Systematic risk assessment of handovers | MAS, MWC, MIK, SC, Researcher |
| Conduct 2 half-day FMEA workshops at each site | | | Qualitative description of failure trajectories through the emergency care pathway | |
| Analyse data | | | | |
| Produce final WP 1 report | | | Final WP 1 report | |
| WP 2 – Common organisational deficiencies and the impact of organisational models of care delivery | 01/03/12 | 31/08/12 | | MAS, PS (WP Leader), SC |
| Objective: | | | | |
| 1. O2-1: To identify common organisational deficiencies that affect clinical handover in the EC pathway | | | | |
| 2. O2-2: To describe the impact on handover of different organisational setups of care delivery within the EC | | | | |
| WP 2-1: Common organisational deficiencies | 01/03/12 | 31/05/12 | Qualitative analysis of common organisational deficiencies impacting the quality of handover | MAS, PS, SC |
| Cycles of – | | | | |
| Conduct interviews at each site | | | | |
| Analyse and code interviews using constant comparison | | | | |
| Data synthesis | | | | |
| WP 2-2: Impact of organisational models of care delivery | 01/06/12 | 31/08/12 | Qualitative description of differences in the organisational models of care | MAS, PS, SC |

| | | | | |
|---|----------|----------|---------------------------|---|
| Perform comparative qualitative analysis | | | delivery and their impact | |
| Produce final WP 2 report | | | Final WP 2 report | |
| WP 3 – Recommendations Objective: Provide recommendations from a systems perspective for improving the reliability and quality of handover within the Emergency Care pathway | 01/09/12 | 30/09/12 | Final report | MAS (WP Leader) , MWC, MIK, PS, SC, NR, Researcher, JN |

Gantt-Chart

| Work Package | Apr-11 | May-11 | Jun-11 | Jul-11 | Aug-11 | Sep-11 | Oct-11 | Nov-11 | Dec-11 | Jan-12 | Feb-12 | Mar-12 | Apr-12 | May-12 | Jun-12 | Jul-12 | Aug-12 | Sep-12 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| WP0: Ethics & Final Research Protocol | | | | | | | | | | | | | | | | | | |
| WP1-1: Description of pathway & handovers | | | | | | | | | | | | | | | | | | |
| Deliverable: Process maps & descriptions | | | | | | | | | | | | | | | | | | |
| WP1-2: Reliability assessment | | | | | | | | | | | | | | | | | | |
| Deliverable: Quantitative assessment of handover reliability | | | | | | | | | | | | | | | | | | |
| WP1-3: Potential for harm & failure trajectories | | | | | | | | | | | | | | | | | | |
| Deliverable: Risk Assessment report | | | | | | | | | | | | | | | | | | |
| WP2-1: Common organisational deficiencies | | | | | | | | | | | | | | | | | | |
| Deliverable: Qualitative description of common org. Deficiencies | | | | | | | | | | | | | | | | | | |
| WP2-1: Impact of organisational setup | | | | | | | | | | | | | | | | | | |
| Deliverable: Qualitative description of differences and their impact | | | | | | | | | | | | | | | | | | |
| WP3: Recommendations | | | | | | | | | | | | | | | | | | |
| Deliverable: Final report | | | | | | | | | | | | | | | | | | |

7. Project Management:

The project will be monitored and management by the Project Executive Team (Dr Sujan, Prof Cooke, Prof Spurgeon, Project Manager) under the overall leadership of Dr Mark-Alexander Sujan. As Chief Investigator, Dr Sujan will be responsible for overseeing relations with the study sites, general coordination and communication with the SDO programme, and for ensuring that deliverables and reports are produced according to the project plan. The Project Executive Team is based at Warwick Medical School and will hold fortnightly project meetings. This arrangement ensures that the experience of successfully managing a large number of projects by the co-applicants can be brought fully to this project, and that potential risks can be anticipated early and mitigated effectively.

The co-applicants include a member from each site. Researchers at the sites will be supervised by their local site leads, Prof Cooke (Heart of England), Dr Inada-kim (Winchester), Dr Cross (Lincoln). During the time of their involvement, local researchers will also participate in a fortnightly telephone conference.

A monthly project review meeting will be held involving all project members. We aim to make extensive use of telephone and video conferencing facilities considering the geographic spread of the study sites and participants. Dr Sujan will regularly visit the sites to maintain efficient face-to-face contact with all team members.

Each of the work streams has been allocated a designated lead with responsibility for ensuring the smooth and timely flow of activities within that work stream. Prof Cook will be leading on WP 1 (Potential for harm of handover failures), Prof Spurgeon on WP 2 (Organisational factors) and Dr Sujan on WP 3 (Recommendations).

A Project Advisory Group will be formed involving representatives from the Royal College of Emergency Medicine, Ambulance Services, NPSA and INVOLVE. The Project Advisory Group will be chaired by Dr Jane Jones (Assistant Director, The Health Foundation). Throughout the course of the project, the Project Advisory Group will review the progress of the project through electronic communication and will hold a mid-term review meeting at Warwick.

8. Service users/public involvement:

The project will have a lay person on the Project Advisory Group. Geoff Aitcheson has been involved with Warwick Medical School as a lay research advisor for 8 years focussing on projects related to diabetes and emergency care. He will review the ethics and governance forms before submission and advice on improvements. He will actively participate in project management meetings. At the end of the project he will also ensure that findings are appropriately patient focussed. As with previous projects that he has been involved with, he will be a full member of the research team and will receive all appropriate documentation and invitations to all meetings as well as the key

roles described above. He has undertaken extensive teaching of research staff and has worked with INVOLVE, so has a broad remit and experience.

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