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Decision making and safety in emergency care transitions

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Decision making and safety in emergency care transitions

1. Aims/Objectives:

Aim

To explore the various influences on safe decision making by emergency care staff in order to identify areas where interventions are needed to improve patient safety during transitions, to recommend intervention strategies and to identify areas where further research is needed.

Objectives

1. To map the emergency care system, care pathways, linked services and safety critical decisions in a sample of Ambulance Services in England.

2. To conduct an ethnographic investigation of factors influencing decision making by ambulance service staff directly involved in patient care to identify threats to patient safety and how these threats are managed.

3. To feedback the study findings to participating ambulance services and local stakeholders in order to elicit their views, also to identify areas where strategies are needed to improve patient safety and areas where further research is needed.

2. Background:

The delivery of emergency health care in the NHS embodies major challenges in terms of risk management and patient safety. The emergency care system is an excellent example of care being delivered in demanding circumstances for patients and staff where multiple decisions are made that often involve crossing boundaries between professionals and organisations. Front line Ambulance Service staff are routinely faced with having to make critical decisions about the most appropriate care to deliver in a complex system characterised by significant variety in patient case mix, care pathways and linked service providers. To date there has been very little research within the pre-hospital emergency care settings to identify areas of high risk associated with decision making about patient care options or to examine the ways in which working across boundaries can influence patient outcomes. The journey taken by a patient with an acute healthcare problem who calls an ambulance is complex, from being assessed by the ambulance service over the phone to having clinical assessment and initial emergency treatment at the scene, to a decision about subsequent discharge by ambulance service staff which may involve a range of options. This proposal addresses safe decision making by emergency care staff at various transition points in the pre-hospital emergency care system.

The UK pre-hospital emergency care system has undergone significant changes in its models of service delivery in response to an extraordinary increase in demand for emergency care [1]. In the UK in 1974 the ambulance service responded to 1.5 million calls a year. By 2009/10 this had increased to over 6.4 million responses to 7.9 million calls [2]. The changes to service delivery include the introduction of new staff roles and patient care pathways,

as well as standards and targets, all designed to help services manage demand by improving the efficiency, quality and costs of emergency healthcare. A key theme of Department of Health document Taking Healthcare to the Patient: Transforming NHS Ambulance Services [1] was the development of ambulance services that provide a range of responses and a variety of emergency care options appropriate to the different clinical needs of patients who call 999. For patients with critical or life threatening conditions such as stroke, acute cardiac conditions, serious injury and acute breathing problems, a rapid ambulance response and transport to hospital will always be the appropriate action. However, these types of call account for only 10% of ambulance service emergency workload and there is a desire to provide alternatives that are better matched to clinical need [1].

Patient management activities broader than the traditional respond and transport service are increasingly being carried out by ambulance service staff over the phone (as in nurse telephone triage), and at the scene utilising extended training and adherence with patient care protocols. Patients may now be assessed and treated at scene and left, transferred through other care pathways to community services (e.g. falls, diabetes), or taken to the emergency department (ED) for further assessment and treatment. For some acute conditions (e.g. myocardial infarction, stroke) the appropriate response may involve bypass of the nearest ED and direct transfer to specialist units. These changes have substantially increased the level of complexity for staff with responsibility for making decisions about the appropriate options for patient care, including clinical assessment, treatment and management, referral, and discharge. These decisions are critical to the delivery of safe care as poor decisions can be detrimental to the patient and their care outcomes. This has implications in terms of the appropriate knowledge, skills, and support required to ensure that patient safety is not compromised. The perceived competence and confidence of staff to make these critical decisions also merits attention.

The following five transition points in the emergency care system require staff to make decisions about care options that are likely to have patient safety implications:

- Control room response
- Treat and leave at scene
- Pre-alerts during transport to emergency department
- Bypass of ED and direct transfer to specialist units
- Transfer through other care pathways to community services

To address the patient safety issues associated with decision making behaviour at these transitions it is necessary to examine the influence of the wider organisational system, taking into account ongoing developments such as changes to service configurations, patient care options and staff roles.

The Ambulance Service control room represents the initial transition point for patients making 999 calls. Critical decisions regarding the prioritisation of calls and the most appropriate responses must be made based on information provided by the caller. Two UK studies that have specifically examined safety

and accuracy of call prioritisation systems [3,4] found that the risk of serious under-triage (i.e. assigning a low-priority response to a high priority call) is low, but that over-triage to high priority levels for lower-level priority calls is high. Decisions also need to be made regarding the type of emergency response to send and what information to convey to them. In recent years the initial call-handling process has been enhanced to represent an emergency care response in its own right (hear and treat), which entails decisions over whether or not to dispatch any other resources at all. However there is a little evidence on patient safety issues and what is needed to ensure safe decision making by staff dealing with the varied emergency care case-mix [5].

Ambulance services have made increasing use of extended role practitioners equipped with enhanced knowledge and skills needed to make complex decisions about patient care. Decisions about patient management will involve assessment, diagnoses, treatment, including medication, and discharge or referral. The available evidence for changes in pre-hospital emergency care indicates that these extended roles have provided service delivery benefits in terms of enhanced efficiency of patient care, increased patient satisfaction and a reduction in costs associated with ambulance journeys, ED attendances and hospital admissions [6-9]. However, there remains a lack of research examining the safety impact of these new roles and care pathways despite a recommendation that the safety of these extended roles allowing AS staff to discharge patients at scene or decide on appropriate destinations should be assessed before being widely adopted [10]. Studies employing a retrospective review of patient care records from paramedic practitioners [11] and emergency care practitioners [12] indicated that the care provided by staff in these new roles was appropriate. However, these were small scale reviews and provide a limited assessment of the care provided, with little insight into the influences on care decisions. Other studies evaluating the safety of extended roles have tended to address the risk associated with specific skill acquisition, e.g. pre-hospital thrombolysis [13].

Not transporting patients to the nearest ED requires ambulance service staff to make clinical decisions in a system where ED has traditionally been the default option. Safety concerns have been raised about decisions not to convey patients to hospital. Snooks et al followed up emergency (999) calls for older people who had experienced a fall but were not subsequently conveyed to hospital and found a high rate of subsequent emergency healthcare contacts and increased risk of death and hospitalisation [14].

Although Ambulance Services have polices and protocols to guide staff in making appropriate decisions on leaving a patient at the scene, one UK study points to a disparity between policy and practice. This study of AS staff views on decisions to transport or leave at scene highlighted the complexity of this decision making. For example, decisions about non transportation often involved negotiation between the AS staff and the patient but this was not easily accommodated in the policy and procedures [15]. This study highlights the important issue of patent choice in decisions about their care. Halter et al conducted a qualitative study of the assessment and referral of older people who have fallen, and identified a predominance of informal decision-making processes [16]. They concluded that further research is needed to look at how new care pathways offering an alternative to the ED may influence decision

making around non-conveyance.

Once a decision has been made to transfer to the ED, AS staff have to decide whether to 'pre-alert' the ED of the patients' arrival, and once at the ED have to ensure safe transfer of the patient to a new team of clinical staff. Where care is time critical and specialist attention is required, pre-alerts can ensure that the appropriate resources are available of arrival at the ED. Research addressing transitions between the AS and ED tends to focus on the reliability of information transfer [17]. Similarly, not much is known about the patient safety issues and implications of decisions to bypass the local Emergency Department and transport patients directly to specialist units or to transfer them through other care pathways to community services (for example falls and diabetes services).

Decisions in the context of emergency care are challenging for staff, often time-critical and based on limited information, but wrong decisions in this context could have serious consequences. Researching how people make tough clinical decisions under difficult conditions involves examining how people assess situations and problems, plan, make choices, and take actions [18]. In line with 'An organisation with a memory', which highlights that threats to safety are rarely due to the behaviour of one individual [19], this research will examine influences on patient care and safety within the context of the wider emergency care system. Reason describes the systems approach to patient safety concentrating on 'the conditions under which individuals work and tries to build defences to avert errors or mitigate their effects' [20:768]. The proposed study seeks to increase understanding of the conditions under which emergency care staff work and where increased attention to 'defences' is warranted. Safety culture is now well recognised an important aspect of patient safety and is identified as the first step in the National Patient Safety Agency's (NPSA) 'seven steps to patient safety' [21]. It refers to the shared safety-related values, beliefs and behaviours of the members of an organisation. [22].

A common approach to addressing patient safety is to retrospectively review adverse events and target action at preventing such events in future. For example, the National Reporting and Learning System (NRLS) managed by the NPSA collects reports of patient safety incidents from NHS organisations to assist in improving patient safety in England and Wales. The statistics for Ambulance Services in England (July 2008-June 2009) identify a number of types of incidents that may be connected with decision making and transitions: access/admission/transfer/discharge (23%); medical device/equipment (15%); treatment/procedure (10%); consent/communication/confidentiality (6%); infrastructure – staffing, facilities, environment (5%) and clinical assessment – diagnosis, scans, tests, assessment (5%) [23]. However, the actual number of incident reports received from Ambulances Services (n=2,546) is regarded as relatively low compared to other care settings and therefore this approach is likely to provide only a limited insight on safety issues. This study will adopt a more proactive approach to identifying potential threats to patient safety within the emergency care system, not just where an adverse event has happened.

One approach to conducting research that seeks to understand patient safety issues is the ethnographic approach. Dixon-Woods [24] reviewed four

ethnographic studies of patient safety in hospitals conducted as part of the UK Patient Safety Research Programme and highlighted the valuable insight that this approach can provide. The review concluded that there are multiple interacting influences on safety and solutions need to be based on a sound understanding of the nature of the problems. The studies revealed a number of patient safety challenges common to the four different organisations, which may be issues for attention in the pre-hospital emergency care context:

- Resource limitations contributed to staff learning to tolerate strain by working around problems that were then regarded as 'normal'.
- Policies and protocols were not always adhered to and patient safety incidents were often not reported, for a range of different reasons.
- Teamwork, inter-professional communication and structures of authority did not always function well.

The proposed study will explore the various influences on safe decision making by emergency care staff in order to identify areas where intervention is needed to improve safety, to recommend intervention strategies and to identify where further research is needed.

3. Need:

The extraordinary increase in demand for emergency care over the last decade has led to significant changes in the way pre-hospital emergency care is delivered [1]. These changes have increased the complexity of the system, with the introduction of new services, staff roles and associated patient care pathways, along with increasing demands to meet operational standards and performance targets. Whilst the evidence from research examining some of the new models of service delivery has identified benefits in terms of service efficiency and cost [6-9], the potential impact on safety has received relatively little attention apart from studies that incorporated small scale retrospective reviews of patient records [11-12]. Although some developments, such as patient care protocols are intuitively designed to reduce the possibility for error by providing decision support for emergency care staff, it is by no means clear that safety is enhanced. The proposed study seeks to address this research gap and the need to ensure that these service delivery changes have not increased risk for service users.

Research which enhances our understanding of the challenges that decision making in emergency care situations presents, and contributes to ways in which these decisions can be made more safely whilst also enhancing patient care is even more crucial when we consider the future role of the ambulance service and its staff. In the Department of Health report 'High Quality Care for All: NHS Next Stage Review', Lord Darzi presents a compelling argument for saving lives by creating specialised centres for major trauma, heart attacks and strokes [25]. These proposed changes create a number of specific issues which relate to centralisation of services which are of particular relevance to the ambulance service. These include the safety and reliability of pre-hospital triage systems, treat and leave, the quality of patient care during transfer and the impact of bypassing the nearest hospital to go straight to the facility most capable of providing definitive care for the patient. The issues being

addressed in this project are therefore likely to be highly relevant and important to service delivery in the NHS and will impact on future strategic planning for improving patient care within emergency care.

DOH funded Research conducted by the 999 EMS Research Forum involved a prioritisation exercise to identify research topics relevant to pre-hospital care followed by a rapid review of current evidence on the prioritised topics [24,5]. One of the three main themes identified in the prioritisation exercise was managing increased demand for emergency care by: safely managing increase workloads; safely reducing ED transports for minor conditions; and safely bypassing ED for some major conditions [26]. The review of evidence highlighted a lack of studies taking a whole systems approach to examining the provision of pre-hospital care, taking into account call categorisation, assessment, response and clinical management options, including services across the entire emergency ambulance call profile [5]. This evidence gap undermines attempts to fully understand the issues around alternatives to ambulance response or transportation to the ED, as well as the skills needed to deliver the services. The proposed study aims to adopt a whole systems approach and map the pre-hospital emergency care system in a number of ambulance services to specifically address safety issues

The need for research to conduct a safety assessment of extended roles allowing ambulance service staff to discharge patients at scene or decide on appropriate destinations was expressed by Cooke et al (2005). Their SDO funded systematic review of innovations to reduce attendances and waits in emergency departments recommended that this research should be prioritised before changes were widely adopted [10]. A more recent review and Delphi consultation exercise to identify priorities for research in pre-hospital care identified the top priority in relation to alternatives to ambulance response or transport to the ED as the ‘safety, costs and benefits of alternatives to conveyance to hospital’ [24]. Research examining extended roles identified decisions to leave patients at home as a particular safety concern warranting attention [14]. Vincent (2006) also highlights the importance of research that will establish that such innovations intended to maximise access and reduce costs do not undermine the safety of patients [27].

In line with the organisational focus of the SDO programme, this study takes a whole systems approach by using mixed methods to capture experiences from numerous perspectives, including healthcare workers and patients, to assess the safety of patient care delivered. The study will add to knowledge regarding the impact of new models of service delivery in supporting not just more efficient and cost effective care but also safe approaches to service delivery in the context of rising demand for emergency care. This has direct relevance to pre-hospital emergency care providers and has the potential to identify lessons relevant to other healthcare services. The issues being addressed in this study are likely to remain highly relevant to NHS service delivery in relation to the identification of significant influences on the delivery of safe care, the impact of service changes and potential strategies to minimise risk for patients.

The study will build on existing research examining service delivery innovations in emergency care, including SDO funded research conducted by

members of the research team, evaluating the Emergency Care Practitioner (ECP) role (SDO/98/2005) [12] and the management of low priority ambulance calls by NHS Direct (SDO 08/1304/43) [28]. The proposed project draws on considerable experience within the team on researching emergency medicine, organisational psychology and safety. Also, work developing and validating clinical performance measures for ambulance services.

4. Methods:

a. Design

The study adopts a systems approach to explore influences on safe decision making in the pre-hospital emergency care system. It will consider all aspects of the system using a human factors framework to address the following factors identified as influencing patient care: patient characteristics; task factors; individual (staff) factors; team factors; work environment; and organizational and management factors [29]. This framework is based on established human factors theory and knowledge including Reason's model of organisational accidents [20], which has been widely used in healthcare.

The study will adopt a multiple case study design and use mixed qualitative methods to examine the various influences on decision-making by emergency care staff at major transition points in the care process and the safety implications for patient care in three Ambulance Service Trusts. This approach will involve data collection and analysis techniques that support a detailed elucidation of issues needed to understand complex systems, work settings and decision making. It is now well accepted that qualitative methods have much to offer those conducting health services research [30]. The use of mixed methods will permit the collection of a richer and stronger range of evidence than would be possible using any single method.

The case study approach is being used to gain an understanding of real life phenomenon in depth encompassing important contextual factors and the inclusion of multiple case studies will provide more robust evidence than a single case study [31].

The research comprises the three key features of qualitative research specified by Pope and Mays [30]:

- It is interpretative in nature, being concerned with understanding behaviour and experiences.
- It is naturalistic in studying people in their natural work environment.
- It employs several different qualitative methods.

Three organisational case studies will examine safety in three different Ambulance Services and will address the broad spectrum of care pathways including the key transition points of interest. Specific patient characteristics/conditions of interest will also be considered, for example, the management of head injury or falls, suspected respiratory (asthma or respiratory infection, COPD) or cardiovascular (chest pain or weakness) conditions and abdominal (pain or urinary) symptoms.

The study will comprise three phases. Phase 1 aims to provide an

understanding of the context for the three case studies by mapping the emergency care system, care pathways, linked services, safety critical decisions, and organisational characteristics that may affect patient safety in the participating Ambulance Services. Phase 2 will examine decision making practices around the major transition points in three ambulance services and their linked urgent/emergency care network. It will address how the emergency care system influences decision and identify the key issues for staff and service users. Finally, Phase 3 will feedback the findings from Phase 1 and 2 to key stakeholders in order to elicit their views. The study findings will contribute to the evidence base on patient safety in emergency care and will identify significant threats to the delivery of safe care, significant strengths, and to identify areas where strategies are needed to improve patient safety and areas where further research is needed.

b. Setting

The selection of three Ambulance Service Trusts will ensure that the study represents the variety of contextual factors in the pre-hospital emergency care system (e.g. care pathways, staff roles, service configuration) and the issues identified will have relevance to the other nine Ambulance Service Trusts in England. Having three case study organisations will provide the opportunity to examine similarities and differences in system characteristics and how these relate to delivering safe care. It is also an opportunity to examine potential differences in safety culture across the three organisations. The three trusts selected will provide information on the delivery of pre-hospital care across diverse geographical areas, including densely populated urban areas and sparsely population rural areas. They also serve socioeconomically diverse populations and provide a variety of emergency care responses (e.g. paramedic, technician, ECPs, life cycle schemes). A recent report on the National Ambulance Service Clinical Performance Indicators highlights variation in performance and different processes in the trusts, as well as a number of quality improvement initiatives [32].

Specific areas within the three participating ambulance services will be identified that would be best suited for participation in Phase 2 of the study, in order to include a range of different patients encompassing the major transitions points of interest (control room response; treat and leave at scene; pre-alerts during transport to emergency department; bypass of ED and direct transfer to specialist units; and transfer through other care pathways to community services). Purposive sampling [33] of staff and service users within each case study ambulance service will aim to ensure representation across all levels of the emergency care system and in relation to care pathways of interest within each service. The study will permit an examination of issues within and across the three ambulance services.

c. Data collection

Phase 1 (months 1-10): Mapping the system

Phase 1 will address study objective 1. An initial mapping exercise in participating Ambulance Services will provide an understanding of the system in which pre-hospital emergency care is delivered. This will involve interviews

with key personnel (n<15) to develop a representation of the system that includes the various care pathways, protocols, transition points and threats to safety. Personnel invited to participate will include clinical governance lead, director of operations, medical director or clinical lead and healthcare professionals involved in day to day patient care (e.g. Paramedics, ECPs). Members of the project team with Ambulance Service posts will assist researchers in gaining access to appropriate informants.

System characteristics that may influence the delivery of pre-hospital emergency care patient care will be considered, including:

- Resources (e.g. funding; facilities; staffing – numbers and competence)
- Service demands (e.g. patient numbers; geographical coverage; performance targets)
- Organisation of service delivery (e.g. network of service providers; protocols and guidelines)

Relevant key documentary information will be examined where appropriate, for example, protocols, guidance or standards that influence decisions over patient care. Phase 1 will inform the planning of case study work in phase 2, including prioritising issues for attention. Relevant information from the SDO funded project 10/1008/12 (Patient Safety in UK Ambulance Services - a scoping review) will also be considered, specifically initial findings from the review of evidence on patient safety in Ambulance Services.

Phase 2 (months 3-13): Ethnographic study of decision making practices and patient care

Workforce

2a. The exploration of decision making by AS staff will entail an in-depth inductive exploration using an ethnographic approach [34] to identify key influences on safety in patient care. The ethnographic study will involve at least two operational areas (e.g. ambulance stations) that transport patients to two different Emergency Departments within that Ambulance Service. The mapping exercise will inform the final selection of operational areas to ensure representation of the different transition points of interest. The selection will also ensure representation of the range of staff roles and associated skill sets and responsibilities, in terms of the care pathways that they can offer. The operational areas selected will be large enough to have a range of grades to permit the inclusion of at least two staff from each grade (n = 15 per service). Data collection methods will include observation, interviews, digital diaries, and the identification of any relevant documentation not already identified earlier in the study. It is expected that the researchers will shadow up to three emergency care responders/crews during six shifts. Alternatively to the point where saturation has been reached and no novel information appears to be emerging. Researchers will include an AS secondee trained in participant observation. AS staff and researchers will be provided with digital audio recorders to assist in date collection/recording. AS staff will be asked to record any significant information that may not be revealed during interviews or observations.

2b. Focus groups will be conducted with staff in each Ambulance Service to

explore their views on the patient safety issues associated with decision making at the various emergency care transition points and on the safety culture of the organisation. The focus groups will also address the issue of patient safety culture using the Manchester Patient Safety Framework (MaPSaF) to facilitate reflection on patient safety culture and to stimulate discussion about the strengths and weaknesses of the patient safety culture [35]. The Manchester Patient Safety Framework (MaPSaF) is a tool designed to help NHS organisations and healthcare teams assess their progress in developing a safety culture. MaPSaF uses critical dimensions of patient safety that relate to areas where attitudes, values and behaviours about patient safety are likely to be reflected in the organisation's working practices. For example, how patient safety incidents are investigated, staff education, and training in risk management [36].

The discussion will also identify and prioritise: decisions about patient care; care options; transitions points; patient safety concerns; system characteristics influencing their decisions about patient care (resources; service demand; organisation of service delivery); and areas where intervention is needed to improve patient safety. The discussion will address issues of perceived competence in relation to roles and responsibilities as well as confidence in their decisions making ability, inclining knowledge, skills and support. Participants will be asked to reflect on their experiences where possible and without compromising patient or staff anonymity.

The focus group approach is particularly suited to gaining insights into users' experiences and views by encouraging interaction to exchange ideas and comment on each other's experiences or points of view [37]. It is anticipated that the opportunity to share experiences and views will stimulate participants to recall events and to express opinions that they may not have considered in the isolation of a one to one interview. However, it is acknowledged that participants may have concerns about openly sharing experiences and opinions with a group of co-workers and the researchers/facilitators will seek to ensure that participants are fully informed and have considered the balance between what will be informative for the study and what they feel comfortable disclosing in a group context.

Service Users

2c. In order to understand the relative importance of safety for patients accessing emergency services, two groups (n<8) of service users will be convened in order to elicit their views on safety in emergency care settings. The involvement of service users in identifying and prioritising research issues is important to make practice and policy more relevant to their needs [38]. Their experiences and knowledge can complement those of clinicians, health professionals and researchers [39]. A focus group approach will be used to identify and prioritise service users concerns about patient safety in emergency care. The group discussion will explore their experiences and views on the transition points in pre-hospital emergency care and their perceptions of safety issues associated with decisions, specifically addressing the five major transition points of interest in this study.

A key strength of the focus group discussion in gaining insights into users' experiences and views is that group members are encouraged to

communicate with one another, exchange ideas and comment on each other's experiences or points of view [37]. Recruiting patients to focus groups can be difficult and time consuming [40]. It is proposed to involve the established links with service user networks and groups to minimise these difficulties. Service users involved in the core project team and the advisory group will be engaged in this task.

Interviews and focus group discussions will be audio recorded and transcribed with permission. Interviews will be semi structured to permit interview to articulate their experiences and views in their own words but focusing on a specified set of issues. Data will be stored securely and in accordance with data protection guidelines.

Phase 3 (months 6-15) Feedback and validation workshops

Months 6-14 will entail the collation of research findings from each of the three Ambulance Services followed by local feedback workshops at each of the AS sites. The aim of these workshop is to feed back and validate the findings from the study with the AS staff and any local stakeholder including service users. Feedback will be elicited from workshop attendees regarding the key patient safety issues identified, the intervention strategies and research gaps. This input is expected to enhance the validity of study findings presented in the final report.

The final month of the project (month 15) will be spent finalising the project report. At this stage of the project we will also plan wider dissemination of research outputs (conference presentations and publications) and the development of a project website to disseminate findings. Ambulance service and user representatives involved in the project will assist in ensuring that the dissemination targets and is appropriate for a range of audiences.

d. Data analysis

The project will generate a large volume of data which will be managed through the use of the NVivo software tool to support the analysis of data collected using the different methods. All the primary data collected will be in an electronic format suitable for analysis. As far as possible secondary data (e.g. documents) will be put into electronic format to permit links to be made across the multiple methods using NVivo. A combination of ethnographic methods of analysis [41] and thematic analysis [42] will be conducted. All analyses will involve two researchers. A single case study approach will be adopted at first followed by cross-case analysis to compare findings across the three case study sites. [31].

5. Contribution of existing research:

The proposed study will be undertaken in the challenging NHS environment of pre-hospital emergency care. To date, these environments are relatively research-poor. It is also difficult to undertake health services research in these contexts due to the time-critical nature of some of the work and the relatively short time period of pre-hospital care as part of the whole care episode. This study provides an excellent opportunity to increase the level of

involvement of ambulance services in research. By seconding researchers from within these organisations for part of the study, it is expected that research skills will be transferred to the organisations that could be used for their own purposes in the future.

It is expected that the findings of the study will be of direct relevance to emergency care services in identifying potential influences on decision making and the delivery of safe care especially across boundaries. They will identify strategies for improvement and areas needing further research. The study is also expected to contribute methodological messages to inform future research in the pre-hospital emergency care setting.

6. Plan of Investigation:

The project is 15 months in duration.

Recruitment of research staff, research ethics and R&D approval will be instigated by the CI before the study commences.

Months 1-10: Phase 1 - Mapping the system

Months 3-13: Phase 2 - Ethnographic study including focus groups

Months 6-14: Phase 3 - Feedback workshops

Months 14-15: Collation of findings and writing the report.

7. Project Management:

The lead applicant, RO (15% WTE), will be responsible for strategic management of the project and will be supported by a research associate (100% WTE over 15 months) and a clerical officer (20% WTE for 12 months). In addition an Ambulance Service researcher (40% WTE over 9 months) will be seconded for a three month time period at each of the three Ambulance Services to assist with phase 2 the study. It is anticipated that they will be recruited from employees in the participating ambulance services. They will also act as liaison between the NHS organisations and academic institutions. They will support Phase 2 of the study by assisting in organising and carrying out the ethnographic data collection and analysis.

The core project team will meet every month to review and plan project progress. An advisory group will meet every four-five months to provide independent advice to the core project team.

8. Service users/public involvement:

The applicant team includes EH - a patient user representative who is supported by Sheffield Emergency Care Forum (SECF) a local user group established by EH. EH is experienced in providing a patient perspective in emergency services research and will contribute to all stages of the project planning, data collection, analysis and dissemination. The project steering group will also include representation from the Sheffield and East Midlands Service Users groups. Service users will ensure a focus on the patient experience throughout the study and will assist in recruiting service users to participate in the phase 1 focus groups and the phase 3 workshop. The

workshop is designed to feedback the research findings to stakeholders and elicit their views on the potential implications. Their views will be included in the final project report. In addition to EH, service users involved in the advisory group will be consulted on the workshop and website content to help communicate information in a way that is clear and easily understood without misrepresenting findings or causing unnecessary alarm for service users.

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