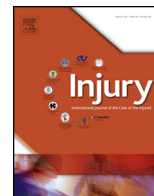




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## Beliefs and expectations of rural hospital practitioners towards a developing trauma system: A qualitative case study

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### ABSTRACT

**Background:** An understanding of stakeholders' views is key to the successful development and operation of a rural trauma system. Scotland, which has large remote and rural areas, is currently implementing a national trauma system. The aim of this study was to identify key barriers and enablers to the development of an effective trauma system from the perspective of rural healthcare professionals.

**Methods:** This is a qualitative study, which was conducted in rural general hospitals (RGH) in Scotland, from April to June 2017. We used an opportunistic sampling strategy to include hospital providers of rural trauma care across the region. Semi-structured interviews were conducted, recorded, and transcribed. Thematic analysis was used to identify and group participant perspectives on key barriers and enablers to the development of the new trauma system.

**Results:** We conducted 15 interviews with 18 participants in six RGHs. Study participants described barriers and enablers across three themes: 1) quality of care, 2) interfaces within the system and 3) interfaces with the wider healthcare system. For quality of care, enablers included confidence in basic trauma management, whilst a perceived lack of change from current management was seen as a barrier. The theme of interfaces within the system identified good interaction with other services and a single point of contact for referral as enablers. Perceived barriers included challenges in referring to tertiary care. The final theme of interfaces with the wider healthcare system included an improved transport system, increased audit resource and coordinated clinical training as enablers. Perceived barriers included a rural staffing crisis and problematic patient transfer to further care.

**Conclusions:** This study provides insight into rural professionals' perceptions regarding the implementation of a trauma system in rural Scotland. Barriers included practical issues, such as retrieval, transfer and referral processes. Importantly, there is a degree of uncertainty, discontent and disengagement towards trauma system development, and concerns regarding staffing levels and governance. These issues are unlikely to be unique to Scotland and warrant further study to inform service planning and the effective delivery of rural trauma systems.

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### Introduction

Trauma systems have been shown to reduce mortality, decrease morbidity and improve functional outcomes [1–5]. Rural trauma systems face particular challenges, related to geography,

accessibility, low institutional case volume, and the need for secondary transfers [6,7]. The development of a rural trauma system, or a trauma system with a large rural component, is therefore arguably more complex than those in urban settings. The design of trauma systems in the UK has focussed on the designation of major trauma centres (MTC) responsible for managing the most severely injured. However, in rural settings, initial management is likely to be provided at a rural general hospital (RGH) [8]. Patients will often not be able to access definitive care directly; requiring the trauma system to include contingencies of care, such as the provision of local life-saving surgery before transfer to a major trauma centre.

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Scotland (one of the four home nations within the UK) is currently in the process of establishing a trauma system. Each year, the Scottish Ambulance Service – the *de facto* sole provider of prehospital care in Scotland – attends approximately 80,000 incidents involving injury [9]. Around 13,000 (or 15%) of these occur in rural areas (Scottish Urban Rural Classification categories 6, 7 and 8) [10]. Approximately 57,960 patients require admission to hospital as a result of unintentional injury [11]. The Scottish Trauma Audit Group records approximately 800 cases of severe injury (defined by an injury severity score of >15) per year, of which – again – approximately 15% occur in rural areas [12,13].

Until recently, Scotland did not have a defined trauma system, and none of its hospitals were designated as trauma centers. There was no prehospital triage, and the operational policy of the health service in Scotland was to take all patients to the nearest hospital, regardless of the nature of the injuries identified, or the capability of the receiving facility. Mismatch was common, resulting in large numbers of secondary transfers [14–16]. Communication was ad-hoc, with no central coordinating body, and many requests for transfers requiring multiple telephone calls to different hospitals and specialties.

Following a number of high-level reports, the Chief Medical Officer, has called for “a bespoke, inclusive system, that operates across traditional specialty and geographic boundaries” [17,18]. The Scottish Trauma Network will designate all acute hospitals as major trauma centres, trauma units, or local emergency hospitals [17]. The definitions of these types of facilities have recently been reviewed [19]. Rural critical care retrieval and transfers will be conducted by the Emergency Medical Retrieval Service, an existing physician-delivered service, which relies on a combination of fixed and rotary wing aircraft [18]. The aim of creating a national, inclusive trauma system should be viewed in the context of Scotland’s geography, which includes large remote areas and many islands [20]. The development of the country’s trauma system will therefore require careful consideration to accommodate the practical demands of providing rural care. Practitioners in RGHs are in a unique position to offer insight into the support required to develop an effective trauma system.

This reconfiguration of services into a cohesive system presents an opportunity to understand the implementation of a significant change programme within a variety of remote and rural healthcare settings and will inform the development of rural trauma systems in similar regions, such as North America, Scandinavia and Australasia. The aim of this study was to conduct an exploratory evaluation of the beliefs and expectations of rural hospital practitioners towards a trauma system to identify key barriers and enablers to the development of an effective rural trauma system.

## Method

This is a qualitative study, which was approved by each of the participating health boards. The proposed work did not require the scrutiny of the Queen Mary University of London research ethics committee.

### Sampling and recruitment

Scotland has a land area of 78,770 km<sup>2</sup>, including 800 islands, although only 94 of these are inhabited. Virtually all emergency care is provided by the National Health Service (NHS). Scotland has a population of 5.2 million, concentrated in four major cities – Glasgow, Edinburgh, Dundee, and Aberdeen – each of which will have one MTC in the proposed formal Trauma System for Scotland. The northern part of the Scottish Trauma System will be formed by

five NHS health boards (Highland, Orkney, Shetland, Grampian, and Western Isles), comprising six RGHs [8]. RGHs are defined as “hospitals sited in an area distant from urban conurbations which because of compromised patient travel times provide a locally based consultant led service to meet the healthcare needs of a population” [21]. These hospitals “are the emergency centre for the community” [8]. Some RGHs will be designated as trauma units, and others as local emergency hospitals.

Opportunistic sampling was used due to the limited numbers and availability of rural practitioners. Potential participants were contacted by e-mail. A participant information sheet was attached; explaining the background, purpose and logistics of the study. A time and place was agreed for interview with individuals, prior to obtaining written consent. The sample group included several different stakeholders of rural trauma care, including surgeons, anaesthetists, emergency physicians and nurses. All participants were involved in providing trauma care.

### Interviews and data collection

Data were collected by semi-structured interviews, either individually or as part of a small group of up to four participants, in order to reduce acquiescence and habituation bias [22–24]. The topic guide was created following a review of the literature, discussion with subject matter experts, and piloting (Supplementary material 1) [7,17,18,25,26]. The guide focused on three main areas: 1) evaluating broad understanding of trauma and trauma systems, 2) views on the current trauma pathway and 3) beliefs about rural system development. Interviews were conducted in person or over the telephone, by the same researcher and recorded digitally. In order to ensure confidentiality, recordings were then transcribed and anonymised. Both recordings and transcriptions were stored on an encrypted drive. Data will be held securely for a period of five years from completion of the study to enable further analysis.

### Analysis

The analysis took place in four discrete steps (Fig. 1): 1) pilot coding, to develop analytical thematic framework; 2) coding of participant responses; 3) thematic synthesis and generation of

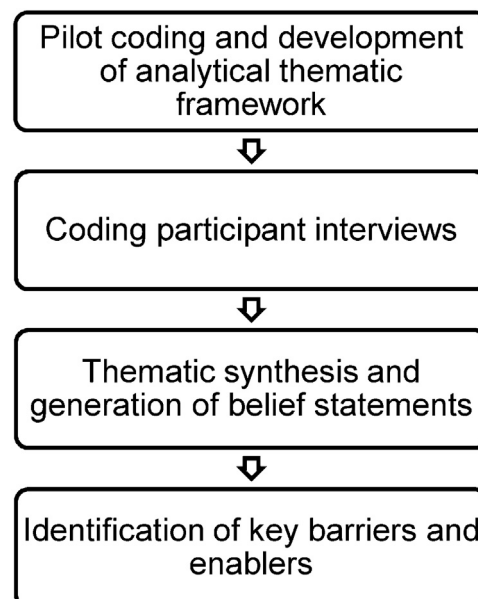


Fig. 1. Data collection and analysis sequence.

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