

**RESEARCH TITLE:** Building Consensus to Enhance Research: A Study Protocol to Determine the Top Issues to Improve Outcomes of Silver Trauma.

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**DECLARATION:** This paper has never been published or submitted to another journal for any purpose. The paper meets the aim of this journal and is formatted according to its author guidelines.

**SUMMARY:**

Improving outcomes for silver trauma requires more active research in this field. However, complexity in understanding research priorities and lack of strong evidence represent a major obstacle to which areas future research should be directed. Therefore, this study protocol aims to build consensus of the top research priorities for improving outcomes of injured older adults. This study will also highlight the current issues in trauma care for older people and contribute a more collaborative and interdisciplinary work among experts who are interested in trauma care for older people. This will be achieved by conducting a modified Delphi technique which consists of three rounds: 1) a divergent phase to elicit a broad range of views, 2) a convergent ranking process (ranking the issues identified in round I), and 3) a consensus meeting (determining to the top three issues of those met the predetermined consensus threshold in round II). Experts from different disciplines who are interested in silver trauma will be invited to participate in this study. This, in turn, will enhance the interdisciplinary work among expert who share the same interest to prioritise the issues in improving outcomes for injured older adults.

## Building Consensus to Enhance Research: A Study Protocol to Determine the Top Issues to Improve Outcomes of Silver Trauma.

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**Keyword:** silver trauma, older adults, outcomes.

### Abstract

**Introduction:** Silver trauma research has several obstacles including complexity in determining research priorities and the lack of strong evidence to improve outcomes for injured older adults (especially evidence from the United Kingdom). Therefore, this study aims to identify, investigate, and prioritise the top research priorities to improve outcomes of injured older adults. The study will also highlight the current issues in trauma care for older people and contribute a collaborative and interdisciplinary work among experts who are interested in trauma care for older people.

**Methods and analysis:** The plan of this study protocol will use a three-step modified Delphi technique. The process of this plan will consist of a divergent phase to elicit a broad range of views, a convergent ranking process in the second round (ranking the issues identified in round I), and a consensus meeting in the third round (determining to the top three issues of those met the predetermined consensus threshold in round II).

**Ethics and dissemination:** The ethical approval of this study is currently underway with the University of Leicester, UK. The findings of this study will be published and presented in relevant conferences.

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## Background:

Current literature has a complexity in determining research priorities in the field of improving outcomes for injured older adults. For example, several issues around the field of prehospital triage of silver trauma were identified in the literature (Chang et al., 2008; Cox et al., 2014; Garwe et al., 2017; Ichwan et al., 2015; Kodadek et al., 2015; Lehmann et al., 2009; Nakamura et al., 2012; Newgard et al., 2016; Staudenmayer et al., 2013), however, only some of them were assessed for their impact on outcomes (Caterino et al., 2016; Cox et al., 2014; Staudenmayer et al., 2013). Furthermore, those issues which were investigated for their impact on outcomes showed conflicting evidence. Moreover, the outcomes that are measured in those studies were not proven to be the outcomes that should be measured for silver trauma.

There is an absence of strong evidence in silver trauma research. For example, all published studies that investigated the issue of prehospital triage for injured older adults applied a retrospective design (Caterino et al., 2016; Cox et al., 2014; Garwe et al., 2017; Ichwan et al., 2015; Kodadek et al., 2015; Lehmann et al., 2009; Nakamura et al., 2012; Newgard et al., 2016; Staudenmayer et al., 2013) or incorporated a survey for their retrospective analysis (Chang et al., 2008). This suggests a need for high-quality research in this field for better understanding of issues in this field and a more active intervention to improve the quality of trauma care for older people. This could start by working collaboratively with many experts who share the same interest in this field to identify and prioritise the most current issues that need to be investigated and analysed in research.

Lack of evidence from the UK for some issues in silver trauma represents an obstacle in current clinical practice. For instance, all published studies on prehospital triage of silver trauma were from the United States (US) and Australia (Caterino et al., 2016; Chang et al., 2008; Cox et al., 2014; Garwe et al., 2017; Ichwan et al., 2015; Kodadek et al., 2015; Lehmann et al., 2009; Nakamura et al., 2012; Newgard et al., 2016; Staudenmayer et al., 2013). There is a report that was published in 2017 from Trauma Audit and Research Network (TARN) about major trauma of older people in England and Wales which has a section about prehospital triage for this population (Trauma Audit and Research Network, 2017). However, this section was restricted to showing the general characteristics of prehospital triage for older adults who sustained major trauma (ISS >15). Therefore, gathering opinions from UK experts about their deeper insight of the current issues for improving outcomes of silver trauma at prehospital and in-hospital care along with linking these to the perspectives of other international experts would help prioritisation.

There is also a lack of interdisciplinary work in silver trauma research. It is believed that assessing and examining research questions in complex health and social concerns by experts and researchers from a diverse range of disciplines should be conducted as addressing such questions by single discipline may be not adequate (Canadian Institutes of Health Research, 2006; Laberge et al., 2009; Slatin et al., 2004). Although conducting interdisciplinary research can be challenging, conducting a consensus study among experts from different disciplines could initiate and contribute interdisciplinary work among experts from various disciplines who are interested in silver trauma to

identify and prioritise research issues in this field and discuss promoting such interdisciplinary work in the future research of silver trauma. Drawing upon the issues identified in the literature and expert opinion, this study aims to identify, investigate, and prioritise the top research questions for improving outcomes of injured older adults. The study will also highlight the current issues in trauma care for older people and contribute a collaborative and interdisciplinary work among experts who are interested in trauma care for older people. Summary of the rationale for conducting this study is presented in Figure 1.

Figure 1: Rationale for selecting a consensus study to determine the top issues in this field to enhance research.

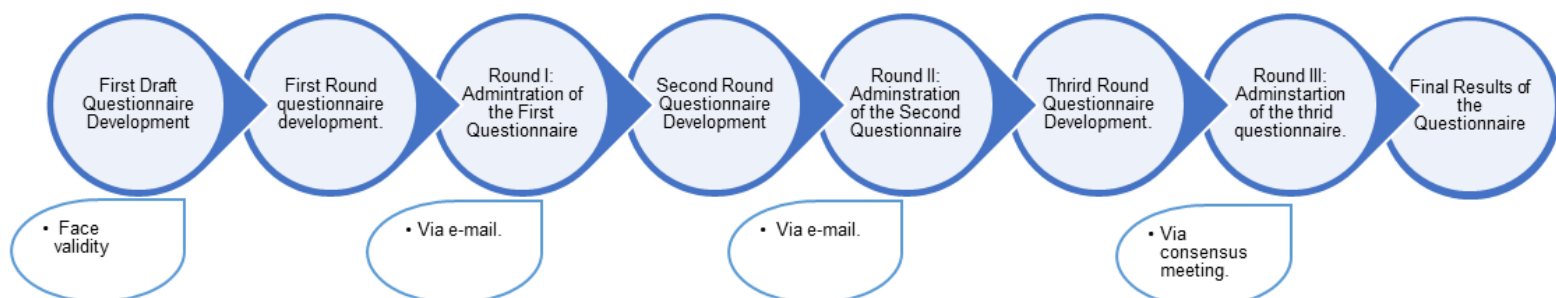


### Methods and Design:

The plan of this study protocol will use a three-step modified Delphi technique. The process of this plan will consist of an idea generating (divergent) first round, a ranking evaluation in the second round, and a consensus meeting in the third round. The plan for conducting this study is shown in Figure 2.

The Delphi technique is a structured process for collecting and extracting information from experts by disseminating a series of questionnaires where the opinion feedback is controlled (Adler and Ziglio, 1996). This technique is suggested to enhance heuristic and informed decision-making (Adler and Ziglio, 1996 and Delbecq et al., 1975). Furthermore, this technique works well when the objective is to better understand issues or to develop predictions and estimations (Skulmoski et al., 2007). The Delphi technique has been applied widely in the area of medicine and prehospital care for the goal of prioritising research questions and enhancing programme planning but not has been applied to determine research priorities for silver trauma (Efstathiou et al., 2007; Jurkovich et al., 2004; Lynch et al., 2001; Nathens et al., 2006; Ota et al., 2008; Schneider et al., 2016; Snooks et al., 2015; van de Glind et al., 2016).

*Figure 2: The plan for conducting the study.*



## Study Team

A study team included a professor in geriatric medicine, two professors in emergency medicine and one PhD paramedic student in order to plan this study, monitor its progress and assign roles in conducting this study in all rounds and performing its analysis. Furthermore, the study protocol and the questionnaires will be assessed by external emergency medicine consultants who are interested in geriatric medicine to ensure high-quality consensus study. The quality indicators and, in addition, the methodologic criteria for reporting Delphi studies in publication proposed by Diamond et al. (2014) were considered when developing this protocol.

## Participant Selection

Approximately 500 experts who are interested in this area of study will be invited to participate in all rounds. Those experts are from Trauma Audit and Research Network (TARN), the joint Society of Acute Medicine, Royal College of Emergency Medicine and British Geriatrics Society special interest group on urgent care for frail older people and the joint European Union Society of Emergency Medicine and European Geriatric Medicine Society geriatric emergency medicine group. Experts will be invited with the expectation of the variation in the opinions among the experts depending on their research experience, clinical role, career stage and the area of their clinical practice.

## Delphi Technique:

### *Round I – qualitative assessment:*

In the first round, a web-based questionnaire asking participants to identify up to three top issues to improve outcomes for injured older adults will be sent through email. This will help to direct the focus of the participants to highlight and determine the most important issues, depending on their experience, in this field that need to be addressed in research. In addition, some demographic data will be collected from the participants including their clinical role, specialty, years of experience, and regions of their current clinical practice. In this round, the invited experts will have two weeks period to participate and respond to this questionnaire through email. After receiving all the

completed questionnaires, the study team will collect, review, and form a list of the issues identified by the participants for inclusion in round II of this study. The issues that share similar ideas will be jointly gathered to form a more representative issue. Others which are duplicates or determined by the study team that are not related to the topic will be removed from the final list for inclusion in round II.

*Round II- ranking evaluation:*

The second version of this web-based questionnaire will be sent through email to all participants in round I of this study. It will include a list of the issues identified by the participants in round I. The participants in this round will be asked to rank each issue on a 5-point Likert scale (see Table 1). The participants will rank the issues with consideration of FINER criteria (Hulley et al., 2007). The questionnaire will remain online for two weeks. The inclusion criteria of issues for final evaluation in round III was predetermined by the study team (see Table 2). The issues that meet either inclusion or non-consensus threshold will be added to the list for round III of the study. Those which meet the exclusion threshold will not progress to the next round and therefore will be excluded. In case none of these issues reach inclusion or non-consensus threshold, the study team will lower the thresholds to get acceptable number of issues that can progress to the next of this study. The acceptable number of issues was predetermined as the top ten issues which can progress to round III of this study.

Table 1. Round II 5-point Likert Scale.

1	2	3	4	5
Strongly disagree	Disagree	Neither agree or disagree.	Agree	Strongly agree

Table 2. Round II predetermined consensus thresholds.

Round I Consensus thresholds	
<b>Inclusion</b>	>75% of respondents provide a positive result (four or five) on the Likert scale for all criteria.
<b>Exclusion</b>	>75% of respondents provide a negative result (one or two) on the Likert scale for all criteria.
<b>Non-consensus</b>	When the proposed priority research question has met neither the inclusion nor exclusion consensus thresholds.

*Round III- consensus meeting:*

This is the final round in this study where a consensus meeting will be held to determine the top three issues in the field of prehospital triage for injured older adults. Experts from all across the UK who are interested in this field will be invited to this meeting including experts from TARN and others who are interested in this field and work at different NHS trusts. A maximum of twenty-five experts will be invited with the considerations of selecting experts from different regions, NHS trusts, clinical roles, and

career stages. After discussing the nature, clinical importance, and current evidence around each issue, attendees will be asked to prioritise the top three issues that need to be addressed in current research using a grading scale (see Table 2). The three issues with the highest mean values will be determined in the meeting. The study team will also take the opportunity in this consensus meeting to discuss with the experts the best study design to answer each issue and the strategies to enhance a more collaborative and inter-disciplinary work in order to achieve high-quality research in this field.

*Table 3. Round III final grading sale of the top issues.*

Rank	First	Second	Third
Points	3	2	1

### Statistical analysis:

Percentage, interquartile range (IQR), and mean will be used to assess and analyse the demographic information and the ranking scales. In the first round, percentages will be used to assess the demographic information. In the second round, percentage will be used to determine the issues ranked on a 5-point Likert scale for inclusion in round III of this study and IQR will be applied to assess outliers which can be discussed during the consensus meeting in round III. In the final round, mean will be used to determine the top three issues for improving outcomes for injured older adults.

### Ethical Considerations:

Ethical approval will be obtained from the University of Leicester before conducting this study. The invited participants in round I and round II will initially receive a consent form in the online questionnaire at the first round asking them to whether accept or reject their participation in this study before going ahead and completing the questionnaire. The consent will also declare that the participants' deidentified responses about their demographic information and ranking scale in round I and round II could be used in future reiterations and further analyses. In the consensus meeting, the facilitator will ask the invited the participants to complete a written consent before conducting the meeting. All collected anonymised data will be secured in a protected secure network to which only the study team members will have access.

### Discussion:

Building consensus in healthcare research is crucial when an assent of the opinions is not existed due to the lack of information or when there is a conflicting evidence of a certain issue (Jones and Hunter, 1995). The value of applying this method lies within assessing the extent of the agreement (consensus measurement) and resolve disagreement (consensus development) (ibid.). Applying a Delphi technique will help in getting more expert responses and providing the opportunity to get the opinions of experts worldwide who treat and manage patients of various demographics and socio-economic status. However, this will prevent the exploration and discussion about the reasons of disagreement as this technique does not require face-to-face meeting and, therefore, will affect the modification of the opinions in such a study applying this

technique (Jones and Hunter, 1995). Unlike this technique, Nominal Group Technique (NGT), which is another example of consensus methods, is a structured face-to-face meeting and consists of two rounds (ibid.). Although conducting face-to-face meeting in this method could be beneficial, a previous evidence contended that this method has several limitations as it could lead to false consensus if diversity in prioritizing opinions is present, may have a selection bias of participants, and require expert facilitator (Van Teijlingen et al., 2006). As a result, this study will apply a modified method of these two techniques called the modified Delphi technique in order to get the maximum benefits and minimise the limitations of both techniques. This will be achieved by applying a questionnaire in the first and second round to assess consensus measurement and conducting a face-to-face consensus meeting in the third round to assess the consensus development.

The aim of structuring any consensus method is to get the maximum benefits of informed decision making from a panel of experts of a certain issue in practice (process gain) and minimise the disadvantages associated with such a decision-making (process loss), in particular the domination by participants or professional interests (Jones and Hunter, 1995). As a result, this study will start, in the first round, with an open question to allow participants to explore, assess, and submit their ideas without imposing any ideas and views which may alter the final outcomes of this study. Furthermore, anonymity of the responses in all rounds will be ensured. In addition, an expert facilitator will be present in the third round who is going to ensure providing equal chance for expert to view and discuss their opinions without affecting the anonymity of their ranking of the issues.

This study aims to identify, assess, and prioritise the issues for improving outcomes for injured older adults that need to be addressed in research. A modified Delphi technique will be applied in order to maximise the benefits of applying consensus method in this topic and minimise its disadvantages. The study will also seek determining the best study design to answer each issue and discussing the strategies for a collaborative and interdisciplinary work to improve outcomes for injured older adults.

#### **Dissemination Plan:**

The findings of this study will be published in a peer-reviewed journal which, in turn, will add a great value in the contribution of future research and the enhancement of more collaborative and interdisciplinary work in this area of interest. Furthermore, these findings will be presented in relevant regional, national, and international conferences. Moreover, the results of the study will be submitted to TARN to plan the next steps for applying these findings in future research.

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