

# BMJ Open Return to driving following surgery to the upper limb: a scoping review protocol

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## ABSTRACT

**Introduction** Upper limb surgery is a common burden on the active and ageing population, often resulting in a transient state of functional impairment. Many activities of daily living can be affected, including ability to drive. Currently there are no guidelines regarding safe return to driving following upper limb surgery. This scoping review aims to systematically review the current literature on the topic of driving following surgery to the upper limb.

**Methods and analysis** Informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses—Scoping Review extension guidelines, this protocol details the scoping review's methodological and analytical approaches. The review will consider all primary and secondary source articles that examine return to driving following surgery to the upper limb, including the impact of orthoses on functional ability to drive. All studies will be included regardless of methodology and text and opinion pieces will also be considered. Studies conducted in any geographical location or setting will be included in the review. Systematic searches of scientific databases such as OVID (MEDLINE, EMBASE and Cochrane), NCBI (PubMed), Scopus, PsycINFO, EBSCOhost (CINAHL), Web of Science, Google Scholar and ProQuest will be conducted. In addition, relevant organisational websites, dissertations, theses from university repositories and grey literature will be included. Further articles will be identified by searching references of relevant studies. Studies conducted in English in any year will be included. Two independent reviewers will screen identified literature sources based on predetermined inclusion/exclusion criteria. Discrepancies will be resolved through discussion, therefore, negating the need for a third reviewer. Article data will be presented in tabular or graphical format along with a narrative summary.

**Ethics and dissemination** Ethics approval is not required. Findings will be disseminated through professional networks, peer-reviewed publications and conference presentations.

## INTRODUCTION

Surgery to the upper limb accounts for more than 261 000 procedures annually across Australia, many of which result in a transient state of functional impairment during the postoperative rehabilitation phase.<sup>1</sup> Numerous activities of daily living may be impacted, not least the ability to drive.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This review will adhere to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guidelines. This will ensure a rigorous and systematic approach to searching, screening and reporting.
- ⇒ Journals from interdisciplinary fields will be searched to maximise heterogeneity in the results. However, as this topic is multisectoral the potential for an in-depth analysis of profession specific issues may then be limited.
- ⇒ Another limitation is that only articles in English will be reviewed.

Driving is a primary means of mobility, and an important function that is linked to quality of life<sup>2-4</sup> across a diverse range of populations and cultures.<sup>5</sup> Driving status has been shown to have a significant positive effect on physical and psychological health, social networks, productivity and life satisfaction.<sup>6</sup> Driving is also a significant responsibility, with significant safety implications for the driver and for other road users.

During postoperative consultations, patients commonly ask their treating surgeon or therapist for advice on when it is safe to return to driving.<sup>7</sup> The answer remains unclear as there are no guidelines or clinical tests available for clinicians to assess fitness to drive after what is considered a temporary condition.<sup>8-10</sup> In Australia, patients are not required to report their surgery to any of the licensing authorities, and comprehensive driving assessments are only performed when assessing fitness to drive following permanent disability or in the case of chronic medical conditions.<sup>8</sup> These assessments are time-consuming and not financially nor geographically feasible for the many Australians who have undergone surgery to their upper extremity resulting in a transient period of disability.

According to the 'Assessing Fitness to Drive' publication by Austroads,<sup>8</sup> patients must have the following general functional

capacity of the upper limb to be able to drive. Patients must be able to move their upper limbs with sufficient range of movement, sensation, coordination and power to achieve required movements to: operate ignition, hold and turn the steering wheel, operate secondary vehicle controls consistently (eg, indicators) and operate the gear lever and hand brake. The issue of postoperative ability to perform these tasks has been explored in the literature, especially in relation to immobilisation devices which are common following surgery to the upper limb. Studies have found that immobilisation of the upper limb does impact ability to drive,<sup>11–14</sup> however, many patients choose to drive regardless.<sup>14 15</sup>

Research across a variety of countries suggests that health professionals are reluctant to give advice to patients simply due to the lack of guidelines around return to safe driving.<sup>7 9 12 14–19</sup> It is clear the decision to return to driving following surgery to the upper limb involves numerous factors, including trajectory of recovery, the patient's broader medical and social context, road and traffic environment, and medicolegal trends. Without a comprehensive understanding of driving fitness, patients may return to driving in an untimely fashion.<sup>9 18</sup> This is concerning, as patients may not be able to perform the driving tasks required to be considered safe on public roads. In addition, as insurance companies are reliant on medical assessments, and drivers must prove to law enforcement that they are not driving dangerously, patients are placed at risk financially and legally.<sup>7 20</sup> Alternatively, advising the patient not to drive for an extended period of time (ie, for 6 weeks following their operation, reflecting typical bone healing rates) is often unrealistic and can have an impact on the patient's occupation and social life, and may be a factor in non-compliance.<sup>9 12 14</sup>

This paper describes the protocol for a scoping review of published literature on return to driving following surgery to the upper limb and addresses the broad research question 'what do we know about return to driving following surgery to the upper limb?'. It aims to explore, map and summarise the extent, range and nature of the published information on return to driving following upper limb surgery and produce an evidence-based synthesis of the theoretical and applied components of return to safe driving. As this topic is emerging it remains unclear what specific questions can be posed, therefore, this scoping review can synthesise the current evidence and practice in the field prior to being valuably addressed by a more precise systematic review. Given the methodological differences in the available studies on this subject, a scoping review will help better understand current practice and provide a basis for targeting research and targeted research questions. Research gaps and priorities for further study will also be identified.

A preliminary search of PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews and Joanna Briggs Institute (JBI) Evidence Synthesis was conducted and no current or in-progress scoping reviews or systematic reviews on the topic were identified. This review will,

therefore, make an important contribution to this field of research.

### Objectives

The primary objective of this scoping review is to map and synthesise the current state of literature available on driving following surgery to the upper limb. Specifically, we aim to identify what is already known about driving following surgery to the upper limb and clarify the following:

1. Relevant stakeholders.
2. Functional impact of surgery on physical ability to drive, as defined by the Austroads 'Assessing Fitness to Drive' publication.<sup>8</sup> This includes the impact of immobilisation devices (ie, splints, braces, slings, external fixators, casts).
3. The psychosocial and environmental considerations/implications for returning to driving following upper limb surgery, that is, ability to return to work, safety to self and others.

### METHODS

This review will be conducted in accordance with the JBI methodology for scoping reviews.<sup>21 22</sup> The review will be reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA)<sup>23</sup> to ensure a systematic and replicable approach.

### Patient and public involvement

There was no involvement of patients or the public in the design of this study and the research question was not formulated or developed with patient or public involvement. Additionally, no patients or public members are required in order to complete this scoping review.

### Eligibility criteria

The primary aim of the review is to provide a summary of the current literature available on driving following upper limb surgery, therefore, minimal restrictions have been placed on eligibility.

As this review is solely focused on the upper limb, hand to shoulder inclusive of clavicle, it will not include literature on return to driving following surgery to the lower limb. The focus is also limited to the transient period of disability following surgery to the upper limb. The exact time frame for postoperative recovery varies dependent on the procedure performed and rehabilitation protocol and therefore is not specifically defined. It does, however, exclude patients with permanent functional impairments of the upper limb, including those who have undergone any form of amputation.

With that in mind, the concepts of interest for this review will be functional ability to drive, the impact of orthoses (including but not limited to splints, slings, braces, external fixators and casts), identification of various stakeholders and psychosocial and environmental

considerations. This review will consider all articles that broadly define, describe, measure and explore this topic.

This review will consider studies that have been conducted in any geographical location and setting, both national and international. Articles published in English from database inception to the present will be included and will not be limited to a particular population or setting.

### Information sources

The search strategy will aim to locate both published and unpublished primary studies, scholarly articles and grey literature including text and opinion pieces. As this field of research remains in its infancy, the inclusion of these latter forms of information will enable the research team to identify and map themes for qualitative analysis in addition to the quantitative summary of peer-reviewed articles.

The search strategy was developed using an iterative approach with two rounds of preliminary searches and refinement of the search strategy based on initial results and conducted in collaboration with a research librarian.

An initial limited search of MEDLINE (PubMed) was undertaken to identify articles on this topic. Given the objectives of this review are quite broad, two sets of search strings will be used. The first search will focus on return to driving following upper limb surgery and the second search will include orthoses terms to address all specified objectives of this review. Online supplemental appendix I includes the search strategy and index terms used for the first search string. These terms, in addition to text words contained in the titles and abstracts of relevant articles will be used to develop the full search strategy. This full search strategy will be adapted for each included database separately and the exact search strings will be recorded and reported in the review. MEDLINE (Ovid), CINAHL (EBSCO), Embase (Ovid) and Cochrane (Ovid) will be searched. Google and Google Scholar will also be searched with the first 200 results screened for suitability.<sup>24</sup> Preliminary searches have shown that results outside of the first 200 have limited relevance to the topic of this review.

Manual reference list screening of all eligible articles will be performed by the research team. Where full papers cannot be obtained, efforts to obtain the full paper via hard or electronic copy will be made.

### Study selection

Following the search, all identified records will be collated and uploaded into EndNote V.X20.0.1 (Clarivate Analytics, Pennsylvania, USA) and duplicates removed. Titles and abstracts will then be screened by two independent reviewers for assessment against the inclusion criteria for the review. Potentially relevant papers will be retrieved in full and their citation details imported into Covidence systematic review software, Veritas Health Innovation, Melbourne, Australia. The full text of selected citations will be assessed in detail against the inclusion criteria by

two independent reviewers. Reasons for exclusion of full-text papers that do not meet the inclusion criteria will be recorded and reported in the scoping review. Any disagreements that arise between the reviewers at each stage of the selection process will be resolved through discussion. The results of the search will be reported in full in the final scoping review and presented in a PRISMA flow diagram.<sup>25</sup>

### Data extraction

Data will be extracted from papers included in the scoping review by two independent reviewers using a data extraction tool developed by reviewers. The data extracted will include specific details about return to driving following surgery to the upper limb and key findings relevant to the review objectives. A draft data extraction tool is provided (see online supplemental appendix II). The draft data extraction tool will be modified and revised as necessary during the process of extracting data from each included paper. Modifications will be detailed in the full scoping review. Again, any disagreements that arise between the reviewers will be resolved through discussion. Authors of papers will be contacted to request missing or additional data, where required.

### Data analysis and presentation

Given the likelihood that both qualitative and quantitative data will emerge from this study, data synthesis and analysis will be conducted using both a descriptive numerical summary and a thematic analysis.<sup>26</sup> The results will be presented in two parts. First, a numerical analysis will map the data in tabular and diagrammatic form, showing distribution of studies by theme, period of publication, country of origin and study method. Following this, a thematic summary will provide a descriptive analysis describing how the research identified related to the research question and the main findings from these, organised by theme.

A narrative summary will accompany the charted and/or tabulated results and will describe how the results relate to the objectives and review questions.

### ETHICS AND DISSEMINATION

There was no involvement of patients or the public in the design of this study and the research question was not formulated or developed with patient or public involvement. Additionally, no patients or public members are required in order to complete this scoping review. As there is no primary data collected, there is no need for ethical review. Knowledge translation activities will take place throughout the review to ensure results are available to the appropriate clinical and academic audience. As such, the review will be presented at relevant local, national and international conferences and published in a peer-reviewed journal.

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