

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Assessing the impact of care pathways on potentially preventable complications and costs for spinal trauma patients: protocol for a data linkage study using cohort study and administrative data.
<b>AUTHORS</b>	Vaikuntam, Bharat Phani; Middleton, James; McElduff, Patrick; Pearse, Jim; Walsh, John; Cameron, Ian; Sharwood, Lisa

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Dr Mariel Purcell National Spinal Injuries Unit for Scotland, Queen Elizabeth University Hospital Glasgow Scotland UK
<b>REVIEW RETURNED</b>	21-Jun-2018

<b>GENERAL COMMENTS</b>	<p>This is an important piece of work that may shape the provision of SCI care in the future. Apologies for lack of familiarity with the Australian health care system, some of my suggestions to optimise the accuracy of health costs may not be appropriate.</p> <p>1 It should be considered that many of these patients will have suffered a major trauma and will have other immediate healthcare needs not just SCI, multiple admissions to specialist facilities and surgeries will be costly and may not follow the best practice pathway but are appropriate for the patients needs</p> <p>2 Total health resource use should include outpatient hospital appointments related to SCI in the first 12 months post index admission e.g. routine SCI appointment, urology, plastic surgery appointment, primary care consultations, medications, appliances e.g. catheters (if funded by the healthcare system in NSW)</p> <p>3 Delays in discharge (often months)from hospital to home due to lack of appropriate accommodation or care, is a costly burden on healthcare in the UK, is this the case in NSW?</p> <p>4 Is there a healthcare funded SCI outreach cost, e.g. SCI specialists visiting patients in their homes advising on the management of SCI complications e.g. pressure sores, or is this role filled by healthcare practitioners in primary care along with other duties e.g. district nurses visiting patients for 30 minutes every day to perform a bowel routine.</p> <p>It would be interesting if it can be determined where is the most cost effective place to manage complications post index admission, primary care, local hospital or specialist SCI Centre e.g. pressure sores.</p> <p>While this aims to be an economics paper, it would be interesting to compare the outcomes of patients e.g. SCIM in patients who were close to the ideal pathway in comparison with those who deviated significantly.</p> <p>I think these points are more important than QALYs</p>
-------------------------	--

<b>REVIEWER</b>	Weiwen Chen Garvan Institute of Medical Research Australia
<b>REVIEW RETURNED</b>	28-Aug-2018
<b>GENERAL COMMENTS</b>	Good research plan with clear statistical analysis plans

## VERSION 1 – AUTHOR RESPONSE

### Reviewer 1:

Reviewer Name

Dr Mariel Purcell

Institution and Country

National Spinal Injuries Unit for Scotland, Queen Elizabeth University Hospital Glasgow Scotland UK

Please state any competing interests or state 'None declared':

None declared

Please leave your comments for the authors below This is an important piece of work that may shape the provision of SCI care in the future. Apologies for lack of familiarity with the Australian health care system, some of my suggestions to optimise the accuracy of health costs may not be appropriate.

***Thank you for this positive feedback.***

1. It should be considered that many of these patients will have suffered a major trauma and will have other immediate healthcare needs not just SCI, multiple admissions to specialist facilities and surgeries will be costly and may not follow the best practice pathway but are appropriate for the patients needs

***Thank you for this relevant contribution. We propose to conduct sensitivity analysis by decreasing the costs by varying percentages in patients without traumatic spinal cord injury (TSCI) related principal diagnosis in their hospital records to account for the higher costs associated with multiple trauma (page 10).***

***We acknowledge the need to deviate from anticipated care pathways to address patient's needs and anticipate accounting for some of this deviation by conducting a sensitivity analysis with a group of patients with an isolated TSCI and including measures for injury severity, multiple trauma and co-morbidity in the analyses. Thank you.***

***Text has been added to the protocol to acknowledge this limitation (page 14 and 15).***

2. Total health resource use should include outpatient hospital appointments related to SCI in the first 12 months post index admission e.g. routine SCI appointment, urology, plastic surgery appointment, primary care consultations, medications, appliances e.g. catheters (if funded by the healthcare system in NSW)

***Post-index outpatient hospital appointments are pertinent in the estimation of total health resource use. However, we would like to respectfully clarify that outpatient hospital appointments related to SCI are out of scope of the proposed protocol.***

3. Delays in discharge (often months) from hospital to home due to lack of appropriate accommodation or care, is a costly burden on healthcare in the UK, is this the case in NSW?

***The reviewer raises an important and valid point. Yes, this is also an issue in NSW. This will be considered in a subsequent analysis, specifically in our aim to benchmark actual patient pathways and care against the best-practice standards previously defined using a modified e-Delphi process and other sources, quantifying the financial costs associated with deviation of care from best practice standards.***

4. Is there a healthcare funded SCI outreach cost, e.g. SCI specialists visiting patients in their homes advising on the management of SCI complications e.g. pressure sores, or is this role filled by healthcare practitioners in primary care along with other duties e.g. district nurses visiting patients for 30 minutes every day to perform a bowel routine?

It would be interesting if it can be determined where is the most cost effective place to manage complications post index admission, primary care, local hospital or specialist SCI Centre e.g. pressure sores.

While this aims to be an economics paper, it would be interesting to compare the outcomes of patients e.g. SCIM in patients who were close to the ideal pathway in comparison with those who deviated significantly.

I think these points are more important than QALYs

***The costs incurred to the health service in the long-term care of patients with TSCI are significant; including unanticipated complications. The costs of these long-term costs, and the cost effectiveness of the current systems to manage these are in part out of scope of this study's dataset. However, we will measure the impact of complications on acute care costs and length of stay in different acute care treatment settings i.e., specialist spinal cord injury units compared to non-specialist spinal hospitals.***

***We recognize the significance of SCIM for patients with TSCI, and we anticipate evaluating factors potentially associated with unwarranted clinical variation in SCIM for patients with TSCI by benchmarking the current practice against best practice care standards. The financial***

***costs of these deviations from the best-practice care pathway will also be determined as specified in aim 3 (page 11).***

***The use of QALYs in the cost-effectiveness analysis would enhance the comparability of study results, both locally and internationally.***

**Reviewer: 2**

Reviewer Name

Weiwen Chen

Institution and Country

Garvan Institute of Medical Research<br>Australia

Please state any competing interests or state 'None declared':

None declared

Please leave your comments for the authors below Good research plan with clear statistical analysis plans

***Thank you for this feedback.***