Author's response to reviews

Title: A systematic review protocol to evaluate the psychometric properties of measures of function within adult neuro-rehabilitation.

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Author's response to reviews: see over
April 17, 2015

To the Editor,

I am re submitting the manuscript entitled “A systematic review protocol to evaluate the psychometric properties of measures of function within adult neuro-rehabilitation” for review.

Thank you for the opportunity to address the reviewer comments, we have considered and taken on board those comments and edited the manuscript accordingly. I have provided an itemised account in table format of all changes (see following pages).

Thank you for your time and I look forward to your response.

Sincerely

Shannon Pike
<table>
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<tr>
<th>Reviewer 1 Comments</th>
<th>Author’s response</th>
<th>Changes to Text (tracked version)</th>
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<tbody>
<tr>
<td><strong>Background section for the Review is too long and difficult for reading. Background should be more focused on discussed subject and need to be reformulated.</strong></td>
<td>Thank you for your comments, the authors have edited the background significantly to sharpen the focus onto the discussed subject of outcome measurement.</td>
<td>Please see tracked changes to background section.</td>
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<td><strong>Objectives of the Review. The aims of this systematic review protocol were confusing. The research question posed by the authors should be easily identifiable and understood. I seem to understand that the aim of this systematic review is to classify the functional out-come measures reported by Ashford and Turner-Stokes and to systematically locate the existing evidence of the properties of those outcome measures to conclude the best measure available for the particular purpose of measuring activity and/or participation outcomes following upper limb spasticity rehabilitation, however it should be more clearly defined and explained to the readers of your protocol. Please consider including a separate section for Objectives of the Review.</strong></td>
<td>The authors agree that there was ambiguity regarding the objectives of the review and we have now edited the manuscript to include a succinct paragraph at the end of the introduction dedicated to the objectives of the review.</td>
<td>Please see tracked changes lines 175 - 179. The methods now also further itemises the aims of the review, lines 216-224.</td>
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<td><strong>Methods. Criteria for inclusion and exclusion of studies in the review were not well defined. Are these inclusion criteria: “settings and participants; types of methods; types of outcomes; search methods for the identification of studies” - and if positive how they relate to “Screening : Inclusion criteria for articles as described below:</strong></td>
<td>Thankyou. The authors have taken these comments and unified all inclusion criteria and selection details. Exclusion criteria was detailed in the earlier version, however we have now edited the manuscript for clarity so that they are more easily identifiable within the manuscript.</td>
<td>Please see tracked changes; inclusion criteria 226-247 and exclusion criteria 249-283</td>
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1. The aim of the study should be to develop or evaluate the measurement properties of a measurement instrument identified in the review published by Ashford and Turner-Stokes [1];

2. The instrument should aim to measure activity performance or participation, as defined by the ICF. Activity performance is defined as “the execution of a task or action by an individual” or require assistance from or be completed by a carer for the individual.

Participation is defined as “involvement in a life situation”.

3. The instrument is evaluated in patients with spasticity (as defined by the authors of the included studies) or patients before or after botulinum toxin injection.”

I would suggest to unify all the used criteria to make them more comprehensible.

Have you considered any exclusion criteria of studies?

**Reviewer 2 comments**

I am of the view that this is a sequel paper to a previous paper - this should be made explicit in the introduction

The authors can see that this may be viewed as a sequel and have made this more explicit through discussing the Ashford & Turner Stokes study and how this review has extracted information from there and how this will be utilised.

Please see tracked changes. Introduction line 122 and methods section line 205.
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<th>It is clear that the authors have decided to selectively review a small subset of measures from this paper - they need to explicitly articulate the selection with a justification within the context of an ICF framework (at this stage the measures presented in the supplementary material is not a complete list of the measures of activity)</th>
<th>The authors do confirm the reviewers comments, from the 22 studies evaluated in Ashford &amp; Turner-Stokes (2013) systematic review, 33 assessment approaches were identified. On review of those assessment approaches, some were in fact developed for that particular study, for example three functional tasks (palm hygiene, cutting the fingernails, placing arm through the sleeve) and consequently do not have published psychometric properties and were excluded from the current study. This detail has now been added to the protocol manuscript to highlight why a subset of 27 measures of function were identified. This is also further detailed within the methods/design section.</th>
<th>See tracked changes within methods/design lines 205 – 215.</th>
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<td>The method followed does suggest that there is already a selection bias in this review. The methods of measurements identified in the previous paper may not be the best on offer. There is a need to make this bias explicit.</td>
<td>The authors acknowledge that the method chosen to identify methods of measurement may create a selection bias. This bias has now been made more explicit within the manuscript.</td>
<td>Please see tracked changes detailing the methods of measurement selection process, line 214 - 215.</td>
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<td>With respect to the review process a). There is a need for two people to cross check each paper in the various screening and extracting stages</td>
<td>a) Thank you for the recommendation, the author's acknowledge this comment regarding two people cross checking the screening and selection stages. The first author will independently screen all articles, the second author will blindly screen a random 10%</td>
<td>Please see tracked changes in Method adding clarity to the review process. - 303-311</td>
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b). A mixture of scales and methods of measurement are being reviewed. These methods can then be direct, indirect or simulated methods of measurement.

Given that the measures are already known it will be better to explicitly identify which of the COSMIN processes will be followed. Please be aware that the COSMIN is a guideline that has flaws.

c). Some of the methods of measurement have already been comprehensively reviewed - it may help for the authors not to duplicate good work that is already in the published domain. It may be better to put in a process to avoid duplication within this review.

The authors acknowledge the reviewer’s expertise in spasticity measurement and understand the issue raised. This paper is designed to extend the work undertaken in the Ashford & Turner-Stokes (2013) systematic review which stopped short of appraising the psychometric properties of the recommended papers. Given that the Ashford & Turner-Stokes paper is used clinically for the selection of tools for this clinical population, the authors maintain the...
importance of our planned review. We have clarified this now in the background and aims which additionally addresses this confusion raised by the reviewer.

6. A significant limitation in the current literature is the sampling frame used in most studies of psychometric properties of methods of measurement do not study a relevant population (for example the studies that have validated ARAT often use patients who can do the ARAT and in many of the rehab studies the patients are unlikely to be ever complete the ARAT). The authors need to consider at this stage how they going to check for the external validity. We acknowledge that this is a consistent limitation of all COSMIN psychometric systematic reviews; however, given that psychometrics of a tool differ between populations, the methodology selected for undertaking our planned review remains methodologically of high quality. We have, however, made explicit the planned external validity review in our methods of this manuscript, which will see our systematic review reporting on this issue in the results and discussion sections.

Please see tracked changes 362-366.

**Reviewer 2 comments from additional material**

I am puzzled by the inclusion of the term spasticity (this is noise!) - based on my reading of this paper this is a review of the properties of "measures of function"

The authors have taken this into consideration and have edited the title accordingly. Please see tracked changes.

This is a wasted argument

The aim of this study is to review scales of activity / function - there is sufficient justification for this in its own right. There is far too many untested arguments in this paragraph.

The authors have now deleted this argument from the introduction section. Please see tracked changes line 49.
Surely this is more than botulinum toxin A - just focusing on one method of treatment in the introduction introduces an unnecessary bias. The authors agree with the reviewers comments and have removed the focus on this method from the manuscript. Please see tracked changes line 49.

If one presents an argument for measures to be patient centred then one would expect variability in measure selection. As now more clearly stated, the selection of measures is built from the Ashford & Turner-Stokes (2013) systematic review. Please see tracked changes.

“Hypertonicity” This is a term that has no value - please reword this term throughout the manuscript - I am aware this is not the first use of the term. This term has been removed from throughout the manuscript and replaces with an appropriate term within the context of the particular section of the manuscript. See tracked changes.

This is a valid point – “Yet evidence suggests that most neurological rehabilitation clinicians have limited awareness of the range of outcome measures available [18] and while most use impairment based measures few use measures of functional outcomes [5,8]”. Thankyou.

Line 118 – 121 Is this not an very unrealistic position - one needs to consider the argument within the context of an ICF frame work. The term function as used in this introduction seems to allude to both the activity and participation domain of the ICF. There is also the possibility that the authors are alluding to the impairment domain (passive function). It would make sense therefore to present the introduction within this context. The authors acknowledge the potential variability in the use and definition of the term ‘function” throughout the manuscript (please note that the term ‘function’ is used within the Ashford & Turner-Stokes (2013) systematic review). We have now applied the reviewer’s recommendations and edited the manuscript to firstly acknowledge the use of the term “function” within the literature (to ensure continuity with the Ashford & Turner-Stokes (2013) systematic review) and then we define this term within the Please see tracked changes (lines 142-163).
<table>
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<th>Line 123-135</th>
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<td>In my view the argument to justify this review requires the argument presented in this paragraph to become more explicit.</td>
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<td>We have now made this argument clearer.</td>
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<td>Please see tracked changes.</td>
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| “functional outcome measures” not an appropriate word - as they have linked this to passive function and activity in the introduction. |
| The term “function” has been addressed within the manuscript as per reviewer 2 above comment. |
| Please see tracked changes. |

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<th>Line 257 – 261</th>
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<td>Whilst the COSMIN provides a framework for a review. However, aspects of the processes identified by COSMIN, if applied without a full understanding of measurement theory can lead to erroneous conclusions.</td>
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<td>Thank you for this valid point with which the authors acknowledge. The COSMIN checklist 4 – point scale, is the COSMIN published methodology for the appraisal of the psychometric properties of the identified outcome measures within this systematic review. This version is recommended for such systematic review methodology. In addition, the author team have completed 4 COSMIN systematic reviews (Bissett, Cusick, &amp; Lannin, 2013; Wales, Clemson, Lannin, &amp; Cameron, 2012) and published a number of psychometric studies (for example, Bowman, Lannin, Cook, &amp; McCluskey, 2009; Cusick, Lannin, Hanssen, &amp; Allaous, 2014; Cusick, Lannin, &amp; Lowe, 2007; Cusick, McIntyre, Novak, Lannin, &amp; Lowe, 2006; Faddy, McCluskey, &amp; Lannin, 2008; N. Lannin, 2004; N. A. Nil as not indicated by reviewer.</td>
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