PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Protocol for a scoping review of physical rehabilitation interventions in long-term care: tools, models of delivery, outcomes and quality indicators
AUTHORS	McArthur, Caitlin; Gibbs, Jenna; Papaioannou, Alexandra; Hirdes, John; Milligan, James; Berg, Katherine; Giangregorio, Lora

VERSION 1 - REVIEW

REVIEWER	Tom Crocker Academic Unit of Elderly Care and Rehabilitation Bradford Institute for Health Research Bradford Teaching Hospitals NHS Trust UK Author of the Cochrane review "Physical rehabilitation for older people in long-term care". My department is currently in receipt of a NIHR Programme Grant for Applied Research: Development and preliminary testing of strategies to enhance routine physical activity in care homes. Forster A, Young J, Farrin A, Johnson L, Birch K, Hulme C, Godfrey M, Keighley L, Buttle L, Graham E, Firth J, Siddiqi N, Ellard D, Lawton R. £1,647,249, 01/05/2013 - 30/04/2017
REVIEW RETURNED	30-Jan-2015

GENERAL COMMENTS	Thank you for the opportunity to read the protocol for this scoping review of physical rehabilitation in long-term care. This is an area in need of investigation as much remains unknown about the value of physical rehabilitation in long-term care or effective configurations given the variety in residents, facilities and health systems. The research questions are stated without reference to the local (Canadian) context to which they will be applied. Therefore, there is a mismatch between the methods and the questions. It is unclear where objective 3 fits with the research questions. It seems from the methods and this objective that the authors intend to evaluate efficacy/effectiveness in outcomes that 'map' to Canadian quality indicators but the research questions suggest that interventions will just be identified and described. The methods lack sufficient detail on how the data will be drawn together beyond displaying it (p14). The authors do not state how different aspects of the identified interventions will be grouped, how measures will be related to outcomes or outcomes to quality indicators. Descriptions of evaluated interventions are typically poor and use inconsistent language. The authors could look at the recent special issue in the Archives of Physical Medicine and Rehabilitation: "Toward a Taxonomy of Rehabilitation Treatments" for a discussion of relevant aspects. They should define appropriate methods for developing their synthesis.

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	If the description of the interventions is to be sufficiently detailed, additional aspects should be considered than those described in the data to be abstracted including intended behaviour of staff, residents and others and the techniques intended to bring these about. The way interventions are configured to individual participants and facilities should also be considered. The authors' plans seem extremely ambitious. This is not a criticism per se, if they can complete the review as they plan. However, I would caution them to scale back their plans. As first author of the Cochrane review on this topic, the task of maintaining this is very burdensome, with over 100 RCTs due for inclusion in the next update. This protocol casts the net much wider, including a wide range of empirical designs from case-studies onwards and also including passive rehabilitation. Several other systematic reviews of physical rehabilitation in long-term care have been published. Is it likely the proposed study will lead to better understanding of the types of rehabilitation evaluated and their effects? Would it be better for the authors to use the existing systematic reviews (or work with authors of these) and invest their effort in any updates and the policy-specific tasks: identifying tools, models and links to quality indicators? It seems unlikely the authors will be able to recommend rehabilitation approaches for different groups as some of that might be captured in different literature (for example short stays in nursing homes for rehabilitation might be classified in the 'intermediate care' literature in the UK). Tools and models are likely to be at a local level, relevant only to a particular health system. By what criteria will tools and models be assessed as valid? The identification of tools, models or frameworks doesn't seem to be used in the later work. Is this a standalone piece of work? The authors propose to use the evidence and stakeholder consultation to identify which outcomes or quality indicators can be used to evaluate the impact of rehabilitation (p8, l135), suggesting a selection of indicators that it has been demonstrated to affect. Is this appropriate? Should it not be evaluated with respect to the effects it is supposed to have that are relevant to residents, possible risks and costs? The literature on core outcome sets may be relevant here. The search strategy seems limited (Appendix A). For example, the evaluation phrases do not include "effective", "trial", mesh heading "evaluation studies as topic/", "random", "placebo", "meta-analysis" or a range of other terms included in a standard filter. Is it likely case studies would use any of the given terms? Minor points: Questions 2 and 3 seem to have been transposed between the list of questions (p9) and data to be abstracted (p13). Can the exclusion criteria be split up (p12 l222)? I presume it means tools or models that have not been validated will be excluded. Interventions that have not been implemented will be excluded.

REVIEWER	Julie Latchem Cardiff University, Wales, UK
REVIEW RETURNED	22-Feb-2015

GENERAL COMMENTS	The topic of this review is indeed an important one as the authors highlight – in the context of both aging populations and these populations having increasingly and multiple needs which require management in facilities often, over long periods of time. I am

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	however concerned by the recent systematic literature review conducted on the topic as referenced by the authors which states there is limited evidence regarding the effectiveness of PR in the elderly population in long-term care and calls in to question the purpose of research questions here within the context of a scoping review. The focus of the review questions, methodological justifications and clarity regarding the purpose of the review and what is being achieved with the methodology selected however need to be addressed before publication of the protocol in my opinion. Please see specific review comments below: (Please note, the line references relate to the original submission document of the authors as these are clearer than those added by BMJOpen) Abstract: 1) As a 'scoping' review has been selected as the method of investigation here, evaluating or determining the effectiveness of benefit of any intervention cannot be achieved as the review will not evaluate or assess the quality of the any of the literature discovered by the search. If evaluation is what the authors wish to achieve then the research should be reconfigured into several systematic literature reviews. Please revise Line 36-37 "it remains unclear which interventions and models of delivery are most appropriate and beneficial". The protocol begins with and later states the focus of the review on 'Physical Rehabilitation' but this is then lost in the questions broadening further to 'rehabilitation'. Please add 'Physical rehabilitation' into the questions. If the authors wish the research questions to remain as they are currently stated then the protocol needs to be re-written to reflect that. Please revise research questions lines 40-44. Line 49 - 'Data abstracted regarding outcomes and QIs will be mapped onto existing QIs.' What is meant here is unclear. Please clarify line 49. Lines 50-52 - The scoping review aims to identify gaps, it may identify gaps but this will not be known until the review has been conducted. Please amend lines 50-52 - 'Ethics and dissemination: The scoping review will identify gaps in the literature regarding characteristics of PR interventions, the outcomes used to evaluate them and tools to determine eligibility for services.' The review will identify what outcomes and QI's have been used to evaluate PR in LTC but not what can be used. What can be used and whether what has been used already is in fact suitable are different questions, requiring alternative methodology. Please revise lines 52-53 Stakeholder involvement – please see end comments and revise lines 54-55 accordingly.

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	Strengths and limitations: This section requires development and clarity. All bullet points lack clarity and require further explanation. Are each of the bullet points a strength or a limitation? Breadth over depth for example can have disadvantages as well as advantages. There is a current expectation for the reader to make up their own mind. Revise this section (lines 56-62). Make evident whether each point is a strength or limitation. Expand each bullet point and consider adding further points here. Introduction: Line 66 - 'special care facilities' an odd term and one that would not be well accepted by an international audience. Please revise line 66. Line 67 – 'Residents in LTC are complex, with multiple co-morbidities' – Is every single resident in long-term care complex? In what way are these residents complex? The link between your usage of 'complex' and co-morbidities lacks clarity and is a contentious link for me. Do 'co-morbidities' in and of themselves make a resident clinically complex? – Is it not the combination of very particular co-morbidities among other things such as their broader social situation that makes these residents 'complex'. This is a very contentious statement. I accept the second half of that statement however, line 68. Please revise line 67. Although I recognise that 'Physical Rehabilitation' is well defined later, a definition of PR would be useful for any reader here in the introduction. Please add a definition of PR into the introduction. Line 69-70 – 'The goal of PR to maintain and improve mobility, physical activity and overall health and wellness is clear'. But it is not clear to your reader and is an unsubstantiated statement. Please add references middle of line 70 or revise the statement. Line 71-73 – Considering there has been such a recent systematic review – what this review is offering that that systematic review did not, is not clear enough. This review has already systematically identified intervention type and provides much information regarding how they were measured. Although you currently state in lines 77-78 'It remains unclear which dose and frequency of interventions, involved team members and model of delivery are most appropriate and yield the most beneficial results for residents in LTC.' - the 2013 systematic literature review did evaluate physical rehabilitation interventions on this population and concluded that there was a lack of evidence. Considering there will be no evaluation of any of the research reported in the scoping review – identifying what is most beneficial will not be a gap that can be addressed by this review type. Line 79-95 – again there is a focus on the need to determine the best tool, or strategy – to achieve this requires evaluation of the literature being collected – not just the collection of it. The focus of this section needs to be shifted from evaluation to identification. Please revise. Line 97 – 'Should be' or who might benefit from? 'Should be' has a moral undertone. Please consider revising. Line 102 – 'To add to the complexity' – the complexity of what? 'Different categories of resident' – such as? Please clarify and expand line 102.

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	Line 108-110: The distinction attempting to be made here lacks clarity. Revise lines 108-110. Line 110-112 – 'Short-stay residents and residents admitted with a goal of returning home likely have different goals with respect to rehabilitation than long-stay residents and thus would likely require a different amount of services.' This is a huge statement to make – and is unsubstantiated. Who sets goals, how they are set, with and by whom and who is empowered to do so is a major issue in practice. What services are of benefit to patients/residents is primarily determined by everybody other than the patient. Please revise this statement, substantiate it or remove. Line 113-116 – While this may well be the case, this argument has not be clearly made currently through the introduction. Revise the latter half of the introduction to make this argument clearly. Lines 120-122 – A very big claim that such a review could do this considering that it is not assessing the quality of any of the evidence or evaluations of evidence it includes. Objectives: These are well written – but again 'Physical' has been predominantly removed. Please revise the outcomes to clearly indicate the focus of Physical rehabilitation. Methods and analysis: Terms are well defined in this section Research questions – again please add 'Physical' where 'rehabilitation' is stated to improve question clarity. Line 77 'concepts were' - This is a protocol you are not meant to have yet done the searching. Revise 177-184 to keep the tense consistent and remove any suggestion that you already have conducted the search. Good overall search strategy. Good to see the inclusion of grey literature. Line 202 – if the team members who will do this have already been identified – their initials could be placed in brackets here. Line 214-216 – 'For a study to be included, more than half of the participants will have to be elderly' – the issue for me is not the percentage of the number of participants included in a study but whether or not the results relating to your population under study are presented separately or can be easily extracted from the paper. If this is not the case then the study would be useless to you and shouldn't be included. Please revise lines 214-416. Please also detail in the inclusion/exclusion criteria what you mean by a tool that has been 'validated' Consultation: It is great to see the consideration of consultation with stakeholders – however it is not clear what the consultation feeding in to. The scoping review looks at what is already there. Are you carrying out a

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	consultation to get a sense of what this work already offers for them and also identify areas for future research - if so then great but this is not clear. Consultation would be critical as a move from the review onwards but it is not clear what consultation offers the review itself. Is this review fitting within a larger program of work as a context – if so please make that evident. Line 259 – may not will. Amend line 259.

VERSION 1 – AUTHOR RESPONSE

Reviewer 1:
Reviewer Name Tom Crocker

Reviewer Comment: The research questions are stated without reference to the local (Canadian) context to which they will be applied. Therefore, there is a mismatch between the methods and the questions. It is unclear where objective 3 fits with the research questions. It seems from the methods and this objective that the authors intend to evaluate efficacy/effectiveness in outcomes that 'map' to Canadian quality indicators but the research questions suggest that interventions will just be identified and described.

Author's response: We appreciate the point that we are mapping in the Canadian context, as such the Canadian context has been added to the research questions and the wording of objective 3 has been amended as we will just be identifying and describing.

"2) Which outcomes or QIs have been used when evaluating the efficacy or effectiveness of PR interventions in LTC, and how can this inform evaluation of PR using existing QIs in the Canadian context?"

"1) Characterize the types of active and passive PR interventions (e.g., therapeutic goal, frequency, mode of delivery) that have been evaluated for efficacy /effectiveness in LTC
2) Identify which outcomes at the person-, facility- or system-level have been used when evaluating the efficacy/effectiveness of PR interventions in LTC
3) Map the identified outcomes used when evaluating the efficacy/effectiveness of PR in LTC to the existing QIs in LTC across Canada, to inform future program design and implementation
4) Characterize any tools or models that exist or have been validated for decision-making in the allocation of PR resources in LTC
5) Use the available evidence and stakeholder consultation to identify which existing or new outcomes and QIs could be used to evaluate PR at the person, facility or system level."

Reviewer comment: The methods lack sufficient detail on how the data will be drawn together beyond displaying it (p14). The authors do not state how different aspects of the identified interventions will be grouped, how measures will be related to outcomes or outcomes to quality indicators. Descriptions of evaluated interventions are typically poor and use inconsistent language. The authors could look at the recent special issue in the Archives of Physical Medicine and Rehabilitation: "Toward a Taxonomy of Rehabilitation Treatments" for a discussion of relevant aspects. They should define appropriate methods for developing their synthesis. If the description of the interventions is to be sufficiently detailed, additional aspects should be considered than those described in the data to be abstracted including intended behaviour of staff, residents and others and the techniques intended to bring these about. The way interventions are configured to individual participants and facilities should also be considered.

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Author's response: Thank you for your helpful suggestions regarding further clarity on the detail of the methods section for summarizing and reporting the findings. We have reviewed the suggested taxonomy and agree it would be helpful to help organize the types of intervention, however we are concerned with the lack of clarity involved in the taxonomy as to how to classify different types of interventions into the three categories in the taxonomy and that many interventions will actually fall into more than one of the categories. This issue was also identified by the authors of the taxonomy. For this reason we have decided not to use the taxonomy suggested. We will however use elements of the taxonomy to sort the types of interventions. The "typical target" of each intervention will be described, for example interventions targeting strength, balance, aerobic endurance, or those that are multicomponent involving at least two of the previously mentioned.

The following description has been added to the methods section for greater clarity of how results will be presented:
"5. Summarizing and reporting the findings: We will display information sources according to the research question addressed.
Summary: Infographics such as bar graphs and maps will be used to visually display year of publication, country of origin, proportion of articles involving short and long-stay residents, and the proportion of articles that address each research question. .
Research question 1: Interventions: Interventions will be sorted and presented based on the QI they address (see below). Under each QI the interventions will then be grouped based on the level of intervention delivery (person-, facility-, or system-) and a summary of the level of evidence based on the study design will be presented (23). Under each level of intervention a description of the type, frequency, intensity, time/volume and person delivering the intervention will be presented in table format. The types of PR intervention will be grouped based on the target of each intervention, for example interventions will be grouped based on those targeting strength, balance, aerobic endurance, functional skills training or those that are multicomponent involving at least two of the previously mentioned.
Research question 2 - Outcomes and Quality Indicators: The frequency of the constructs and outcome measures used to measure the constructs will be tallied. Interventions will be mapped onto the QI they address by sorting the articles by the outcomes measured. For example, if a study measures falls as an outcome that article would be sorted under the QI "falls". The articles will be sorted into the existing QIs in Ontario (i.e., wait times, incontinence, activities of daily living, effective cognitive function, pain, emergency department visits, falls, pressure ulcers, restraints, medication safety, human health resources, and infections). . If an outcome is reported that does not address one of the current QIs it will be identified as a research gap.
Research question 3 - Tools, models or frameworks for decision-making: A description of the identified tools, models or frameworks for decision-making, the population it has been used with, the country of implementation, and the validation and implementation processes will be displayed and compared in a table."

Reviewer's comment: The authors' plans seem extremely ambitious. This is not a criticism per se, if they can complete the review as they plan. However, I would caution them to scale back their plans. As first author of the Cochrane review on this topic, the task of maintaining this is very burdensome, with over 100 RCTs due for inclusion in the next update. This protocol casts the net much wider, including a wide range of empirical designs from case-studies onwards and also including passive rehabilitation. Several other systematic reviews of physical rehabilitation in long-term care have been published. Is it likely the proposed study will lead to better understanding of the types of rehabilitation evaluated and their effects? Would it be better for the authors to use the existing systematic reviews (or work with authors of these) and invest their effort in any updates and the policy-specific tasks: identifying tools, models and links to quality indicators?

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Author's response: Though our plans are ambitious, to date we have been able to complete screening of all abstracts and grey literature, and abstraction of the majority of the articles. We feel it is important to cast the net wide and include all potential professions involved as well as modes of PR available for the scoping review with the intention to provide a summary of the breadth of literature regarding PR in LTC in order to identify gaps and areas for future research. We do agree that an evaluation of the interventions is too broad a scope and has already been reported on. It is not our intention to evaluate the efficacy or effectiveness of the different types of rehabilitation interventions, and we have therefore removed any descriptions that imply we are doing that from this manuscript. In addition, we will be including systematic reviews in our scoping review – identifying the areas of PR they have been completed in (e.g. PR in general, PR and falls, etc.). Our intent is to identify where work has already been done in PR and where future work could focus.

Reviewer's comment: It seems unlikely the authors will be able to recommend rehabilitation approaches for different groups as some of that might be captured in different literature (for example short stays in nursing homes for rehabilitation might be classified in the 'intermediate care' literature in the UK).

Author's response: We are in agreement that we will not be able to recommend rehabilitation approaches for different groups and are thankful for you bringing this to our attention. We have added this as a statement to our limitations section:

A limitation of the proposed scoping review is that recommendations for rehabilitation approaches for all international groups will not be possible as it may be found in different literature not included in the search strategy. For example, the term intermediate care is used in the United Kingdom for short stays of rehabilitation in nursing homes and might not be captured in our search. By using a standard definition of long-term care in our inclusion and exclusion criteria, we have attempted to capture as much as the international literature as possible.

Reviewer's comment: Tools and models are likely to be at a local level, relevant only to a particular health system. By what criteria will tools and models be assessed as valid?
Author's response: The following statement has been added to address this: "For a tool or model to be considered validated proof of face, construct, or criterion validity must be demonstrated."

Reviewer's comment: The identification of tools, models or frameworks doesn't seem to be used in the later work. Is this a standalone piece of work?
Author's response: Thank you for pointing this out. This has now been added to the summarizing results section (as above):
Research question 3 - Tools, models or frameworks for decision-making: A description of the identified tools, models or frameworks for decision-making, the population it has been used with, the country of implementation, and the validation and implementation processes will be displayed and compared in a table."

Reviewer's comment: The authors propose to use the evidence and stakeholder consultation to identify which outcomes or quality indicators can be used to evaluate the impact of rehabilitation (p8, l135), suggesting a selection of indicators that it has been demonstrated to affect. Is this appropriate? Should it not be evaluated with respect to the effects it is supposed to have that are relevant to residents, possible risks and costs? The literature on core outcome sets may be relevant here.
Author's response: Thank you for this comment. We have removed the evaluation of impact of interventions on quality indicators from the review as this is not realistic or the intention of a scoping review. We intend to identify what outcomes and quality indicators have been used in the literature to evaluate rehab and what QIs stakeholder think should be used to evaluate rehab to identify which QIs

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could be used in the future. This is intended to identify gaps and identify areas for future research in this area. We have attempted to make this clearer in the consultation with stakeholders section:
"6. Consultation with stakeholders: We identified four groups of stakeholders: policy makers, rehabilitation professionals, administrators and health care providers in LTC, and residents and families. During each stage we will consult the stakeholders via video- or teleconference, surveys or one-on-one consultations to identify questions important for decision-making, to get input on key messages and definitions of terms or QIs for PR in the LTC sector, and to identify areas for future research. Additionally, we will hold a one-day stakeholder meeting upon completion of the review that will bring together key stakeholders across multiple disciplines including policy-makers and knowledge users across PR, OT, nursing and kinesiology within the LTC sector. The stakeholder meeting will serve three purposes: 1) to disseminate the results of the scoping review to key stakeholders, and 2) to engage in a formal consensus process using nominal group technique (21,22) to determine which new or existing outcomes and QIs could be used to evaluate PR in LTC, 3) to identify an additional emerging issues and future research priorities for PR in LTC. The scoping review fits into a larger, evolving program of research focused on improving delivery and evaluation of PR in LTC."

Reviewer's comment: The search strategy seems limited (Appendix A). For example, the evaluation phrases do not include "effective", "trial", mesh heading "evaluation studies as topic/", "random", "placebo", "meta-analysis" or a range of other terms included in a standard filter. Is it likely case studies would use any of the given terms?
Author's response: Thank you for your suggestions about the search. After considering a number of filters that could be used to expand the evaluation concept, it has been decided to expand the search to include any and all physical rehabilitation interventions for older adults in long term care that have been reported and evaluated in literature to ensure we are capturing the breadth we propose. The new search no longer requires results to mention tools that assist in decision making, decisions regarding resource allocation, or efficacy/effectiveness of interventions. Instead, the researchers will screen for these elements when necessary.
The remaining search has been reviewed by another librarian and small edits have been made, including adding the subheading 'rehabilitation' to the physical rehabilitation concept. Please see the attached appendix that has been revised.

Minor points:
Reviewer's comment: Questions 2 and 3 seem to have been transposed between the list of questions (p9) and data to be abstracted (p13).
Author's response: Thank you for identifying this error - it has been resolved:
List of questions (p9):
"1)What types of PR have been evaluated for efficacy or effectiveness in LTC? 2)Which outcomes or QIs have been used when evaluating the efficacy or effectiveness of PR interventions in LTC, and how can this inform evaluation of PR using existing QIs in the Canadian context? and 3)What tools or models exist or have been validated for decision-making in the allocation of PR resources in LTC?"
Data to be abstracted (p13):

Summary

Research question 1: Interventions

Research question 2: Outcomes and Quality Indicators

Research question 3: Tools, Models, or Frameworks for decision-making

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Reviewer's comments: Can the exclusion criteria be split up (p12 l222)? I presume it means tools or models that have not been validated will be excluded. Interventions that have not been implemented will be excluded.
Author's response: This has been revised to read: "Exclusion criteria: Papers that discuss tools or models that have not been validated will be excluded. For a tool or model to be considered validated proof of face, construct, or criterion validity must be demonstrated. In addition non-English full text papers, case reports, clinical commentaries, editorials, interviews, lectures, legal cases, letters, newspaper articles, patient education handout, abstracts or unpublished literature will be excluded."

Comments for authors:
The topic of this review is indeed an important one as the authors highlight – in the context of both aging populations and these populations having increasingly and multiple needs which require management in facilities often, over long periods of time. I am however concerned by the recent systematic literature review conducted on the topic as referenced by the authors which states there is limited evidence regarding the effectiveness of PR in the elderly population in long-term care and calls in to question the purpose of research questions here within the context of a scoping review. The focus of the review questions, methodological justifications and clarity regarding the purpose of the review and what is being achieved with the methodology selected however need to be addressed before publication of the protocol in my opinion.
Thank you for your thoughtful and thorough comments. We appreciate the opportunity to address them and for your helpful suggestions. Please see our response below.

Please see specific review comments below:
(Please note, the line references relate to the original submission document of the authors as these are clearer than those added by BMJOpen)

Abstract:
1) As a 'scoping' review has been selected as the method of investigation here, evaluating or determining the effectiveness of benefit of any intervention cannot be achieved as the review will not evaluate or assess the quality of the any of the literature discovered by the search. If evaluation is what the authors wish to achieve then the research should be reconfigured into several systematic literature reviews.

Reviewer's comment: Please revise Line 36-37 "it remains unclear which interventions and models of delivery are most appropriate and beneficial".
Author's response: Thank you for pointing this out. We have revised it to read: "While PR is effective at maintaining or improving physical function, the breadth of PR interventions evaluated in LTC, which outcomes or quality indicators (QI) can be used to evaluate PR, and what tools or models can be used to determine eligibility for PR services remain unknown."

The protocol begins with and later states the focus of the review on 'Physical Rehabilitation' but this is then lost in the questions broadening further to 'rehabilitation'. Please add 'Physical rehabilitation' into the questions. If the authors wish the research questions to remain as they are currently stated then the protocol needs to be re-written to reflect that.

Reviewer's comment: Please revise research questions lines 40-44.
Author's response: Thank you for identifying this error, we have revised this throughout the entire manuscript so all terms rehabilitation now read "physical rehabilitation" or "PR".

Line 49 - 'Data abstracted regarding outcomes and QIs will be mapped onto existing QIs.'

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What is meant here is unclear.
Reviewer's comment: Please clarify line 49.
Author's response: We agree that this statement lacks clarity and have revised it to read: "Data abstracted regarding outcomes and QIs will be mapped onto existing, publicly reported QIs used in Ontario, Canada."

Lines 50-52 - The scoping review aims to identify gaps, it may identify gaps but this will not be known until the review has been conducted. Please amend lines 50-52 - 'Ethics and dissemination: The scoping review will identify gaps in the literature regarding characteristics of PR interventions, the outcomes used to evaluate them and tools to determine eligibility for services.' The review will identify what outcomes and QI's have been used to evaluate PR in LTC but not what can be used. What can be used and whether what has been used already is in fact suitable are different questions, requiring alternative methodology.

Reviewer's comment: Please revise lines 52-53. Stakeholder involvement – please see end comments and revise lines 54-55 accordingly.
Author's response. We agree that we will be identifying what has been used and not what should be used. We have revised this section of the abstract has been revised to read:
"The scoping review will synthesize the characteristics of PR interventions described in the literature, the outcomes used to evaluate them and tools to determine eligibility for services. The review will be the first step in formally identifying what outcomes and QIs have been used to evaluate PR in LTC, and will be used to inform a stakeholder consensus process addressing the same question. The scoping review may also identify knowledge gaps. The results will be disseminated via publication and presentation at conferences, in addition to a one-day stakeholder meeting involving a formal consensus process."

Strengths and limitations:
This section requires development and clarity.
All bullet points lack clarity and require further explanation. Are each of the bullet points a strength or a limitation? Breadth over depth for example can have disadvantages as well as advantages. There is a current expectation for the reader to make up their own mind.

Reviewer's comment: Revise this section (lines 56-62). Make evident whether each point is a strength or limitation. Expand each bullet point and consider adding further points here.

Author's response: Thank you for this comment and we agree that the strengths and limitations section lacked clarity. This section has been revised to make it clear whether each point is a strength or limitation; new points have also been added:
• A strength of this study is it will be the first review using both peer reviewed and grey literature to synthesize what is known about interventions, outcomes, quality indicators, and tools regarding decision making for PR in LTC.
• An additional strength of this study is that it will also be the first study to include both passive and active PR techniques in one review.
• The scoping review will be the first step in a process to determine which outcomes and QIs could be used to evaluate PR in LTC in the Canadian context.
• A limitation of scoping reviews is that they inherently provide breadth not depth about a topic; however, this study will provide a breadth of knowledge about active and passive PR where a depth of knowledge has already been considered via systematic reviews. Additionally, the results may be applicable to many disciplines in LTC including physical therapy, occupational therapy, and nursing, in addition to administration and policy-makers.
• A limitation of this study is that only studies and grey literature published in English will be included, which will limit the scope of this review to articles published in English speaking countries or to those

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that have funds for translation services.

• A limitation of the proposed scoping review is that recommendations for rehabilitation approaches for all international groups will not be possible as it may be found in different literature not included in the search strategy. For example, the term intermediate care is used in the United Kingdom for short stays of rehabilitation in nursing homes and might not be captured in our search. By using a standard definition of long-term care in our inclusion and exclusion criteria, we have attempted to capture as much as the international literature as possible.

Introduction:
Line 66 - 'special care facilities' an odd term and one that would not be well accepted by an international audience.

Reviewer's comment: Please revise line 66.
Author's response: Thank you for pointing this out. This term has been changed to "institutional care facilities".

Line 67 – 'Residents in LTC are complex, with multiple co-morbidities' – Is every single resident in long-term care complex? In what way are these residents complex? The link between your usage of 'complex' and co-morbidities lacks clarity and is a contentious link for me. Do 'co-morbidities' in and of themselves make a resident clinically complex? – Is it not the combination of very particular co-morbidities among other things such as their broader social situation that makes these residents 'complex'. This is a very contentious statement. I accept the second half of that statement however, line 68.

Reviewer's comment: Please revise line 67.
Author's response: We appreciate that this statement is contentious and lacked clarity. This has been revised to read: "Residents in LTC often have combinations of threats to well-being including pain, disability, mental health issues, and social or personal concerns that make their care complex (4). Therefore they often require support by a multidisciplinary team including those providing physical rehabilitation (PR) (3,4)."

Although I recognise that 'Physical Rehabilitation' is well defined later, a definition of PR would be useful for any reader here in the introduction.

Reviewer's comment: Please add a definition of PR into the introduction.
Author's response: We appreciate that not all readers will know what PR is and a definition in the introduction would be helpful for clarification. The definition of PR has been removed from the methods section and added to the introduction.

Line 69-70 – 'The goal of PR to maintain and improve mobility, physical activity and overall health and wellness is clear'. But it is not clear to your reader and is an unsubstantiated statement.

Reviewer's comment: Please add references middle of line 70 or revise the statement.
Author's response: Thank you for pointing this out. Now that the definition of PR precedes this statement, it will be clear to the reader and the reference to the CPA definition has been added.

Line 71-73 – Considering there has been such a recent systematic review – what this review is

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offering that that systematic review did not, is not clear enough. This review has already systematically identified intervention type and provides much information regarding how they were measured. Although you currently state in lines 77-78 'It remains unclear which dose and frequency of interventions, involved team members and model of delivery are most appropriate and yield the most beneficial results for residents in LTC.' - the 2013 systematic literature review did evaluate physical rehabilitation interventions on this population and concluded that there was a lack of evidence. Considering there will be no evaluation of any of the research reported in the scoping review – identifying what is most beneficial will not be a gap that can be addressed by this review type.
Line 79-95 – again there is a focus on the need to determine the best tool, or strategy – to achieve this requires evaluation of the literature being collected – not just the collection of it.

Reviewer's comment: The focus of this section needs to be shifted from evaluation to identification. Please revise.
Author's response: The introduction has been revised to focus on identification:
"The goal of PR to maintain and improve mobility, physical activity and overall health and wellness is clear, however identifying the breadth interventions and models of delivery that have been evaluated for residents in LTC remain to be determined (5,6). A systematic review of active PR in LTC concluded that there is a lack of evidence in this area and revealed heterogeneity in the goals of interventions as well as in the time allocated to PR, the staff delivering PR, and the model of delivery of PR (6). For example, some PR interventions focus on general strength and balance and are delivered by a PR assistant in a group format for 45 minutes three times per week, while others focus on specific activities of daily living and are delivered by a restorative care nurse on an individual basis for one hour daily (6). Additionally, active and passive PR techniques have not been considered to date in one review.
In addition to heterogeneity surrounding PR interventions and which health care member delivers PR care, the outcomes used to evaluate PR are not consistent. A plethora of constructs and outcome measures have been used to evaluate the effect of PR at the resident-level; yet constructs measured to evaluate PR at the facility- or system-level are limited. Constructs measured to evaluate PR at the resident-level include: activities of daily living, balance, muscle power, flexibility, exercise tolerance, physical activity, mood, cognitive performance, quality of life, fear of falling, and perceived health status (6). While resident level evaluation is useful for PR treatment planning and evaluation, facility- and system-level evaluation can allow for comparison of outcomes within and across LTC homes, and provide support for quality improvement strategies.
Quality indicators (QI) are used to monitor and improve quality of care in LTC at the facility- and system-level (7,8). In Ontario, 12 QIs are publically reported for each LTC facility through Health Quality Ontario including: wait times, incontinence, activities of daily living, effective cognitive function, pain, emergency department visits, falls, pressure ulcers, restraints, medication safety, human health resources, and infections (9). Existing QIs have the potential to reflect the quality of rehabilitative care at the facility level within and across LTC homes. Thus, there is a need to determine which could be used to evaluate PR in LTC to inform future policy and research.
Uncertainty surrounding interventions, delivery and evaluation of outcomes of PR in LTC is compounded by additional uncertainty regarding which residents in LTC might benefit from be receiving PR services in LTC. To date, there are jurisdictional differences in utilization rates for PR across Canada and internationally (10,11). Certain studies reveal that older residents with cognitive impairment are less likely to receive PR services (10) despite evidence supporting the efficacy of PR for improving function for individuals with cognitive impairment (12-14). To add to the complexity of who might benefit from PR in LTC there are different categories of residents in LTC such as those admitted for short stays with a definite number of days to rehabilitate after an acute event and return to the community compared with those admitted for long stays requiring ongoing care (16). While the majority of residents in LTC in Canada are in long-stay programs, such that they require residence in LTC indefinitely, there has recently been an increase in the number of short-stay programs in LTC in Ontario (15). There is also international variation regarding the goals and length of stay for residents

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in LTC. For example, in the United States, residents admitted to skilled nursing facilities often have the goal of returning home, while there are wards dedicated to PR in European LTC homes (11,17). The length of stay and goals for PR must be considered in goal setting, delivery and allocation of rehabilitative care.
The aim of the scoping review is to describe the body of literature regarding both active and passive PR interventions and models of delivery, what outcomes and quality indicators have been used to evaluate them and tools or models used to determine eligibility for services. The synthesis will identify the scope of PR interventions and how they have been evaluated, which can be used to inform future research and policy-making. A scoping review has been chosen to provide breadth on the topic, rather than depth, and to include a variety of publication types including grey literature (e.g., policy papers, reports, and clinical practice guidelines) (18)."

Line 97 – 'Should be' or who might benefit from? 'Should be' has a moral undertone.
Reviewer's comment: Please consider revising.
Author's response: This has been revised to read: "regarding which residents in LTC might benefit from be receiving PR services in LTC."

Line 102 – 'To add to the complexity' – the complexity of what? 'Different categories of resident' – such as?
Reviewer's comment: Please clarify and expand line 102.
Author's response: We agree this sentence was unclear. We have revised it to read: "To add to the complexity of who might benefit from PR in LTC…"

Line 108-110: The distinction attempting to be made here lacks clarity.
Reviewer's comment: Revise lines 108-110.
Author's response: We agree this distinction was not clear. It has been revised to read: "there are different categories of residents in LTC such as those admitted for short stays with a definite number of days to rehabilitate after an acute event and return to the community compared with those admitted for long stays requiring ongoing care (16)."

Line 110-112 – 'Short-stay residents and residents admitted with a goal of returning home likely have different goals with respect to rehabilitation than long-stay residents and thus would likely require a different amount of services.' This is a huge statement to make – and is unsubstantiated. Who sets goals, how they are set, with and by whom and who is empowered to do so is a major issue in practice. What services are of benefit to patients/residents is primarily determined by everybody other than the patient.

Reviewer's comment: Please revise this statement, substantiate it or remove.
Author's response: This has been revised to read: "The length of stay and goals for PR must be considered in goal setting, delivery and allocation of rehabilitative care."

Line 113-116 – While this may well be the case, this argument has not be clearly made currently through the introduction.

Reviewer's comment: Revise the latter half of the introduction to make this argument clearly.
Author's response: We agree that this argument was not clear throughout the introduction. Please see the revised introduction above, we have attempted to make our argument clearer throughout.

Lines 120-122 – A very big claim that such a review could do this considering that it is not assessing the quality of any of the evidence or evaluations of evidence it includes.

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Author's response: We agree this is a big claim and we did not intend to imply that we would be achieving this goal. This has been revised to read: "The aim of the scoping review is to synthesize evidence regarding both active and passive PR interventions and models of delivery that have been evaluated, what outcomes and quality indicators have been used to evaluate them and tools or models used to determine eligibility for services. The synthesis will identify the scope of PR interventions and how they have been evaluated, which can be used to inform future research and policy-making. A scoping review has been chosen to provide breadth on the topic, rather than depth, and to include a variety of publication types including grey literature (e.g., policy papers, reports, and clinical practice guidelines) (18).

Objectives:
These are well written – but again 'Physical' has been predominantly removed.

Reviewer's comment: Please revise the outcomes to clearly indicate the focus of Physical rehabilitation.
Author's response: We have added physical to the objectives. This has been revised to read:
"1) Characterize the types of active and passive PR interventions (e.g., therapeutic goal, frequency, mode of delivery) that have been evaluated for efficacy /effectiveness in LTC
2) Identify which outcomes at the person-, facility- or system-level have been used when evaluating the efficacy/effectiveness of PR interventions in LTC
3) Map the identified outcomes used when evaluating the efficacy/effectiveness of physical rehabilitation in LTC to the existing QIs in LTC across Canada, to inform future program design and implementation
4) Characterize any tools or models that exist or have been validated for decision-making in the allocation of PR resources in LTC
5) Use the available evidence and stakeholder consultation to identify which existing or new outcomes and QIs could be used to evaluate PR at the person, facility or system level."

Methods and analysis:
Terms are well defined in this section
Research questions – again please add 'Physical' where 'rehabilitation' is stated to improve question clarity.
Line 77 'concepts were' - This is a protocol you are not meant to have yet done the searching.

Reviewer's comment: Revise 177-184 to keep the tense consistent and remove any suggestion that you already have conducted the search. Good overall search strategy. Good to see the inclusion of grey literature.

Author's response: We have revised to keep the tense consistent and removed any suggestion that we have already done the search. This section now reads:
"Concepts will combined using the Boolean Operator AND, and the search terms within each concept will be combined with OR. Keywords will be searched using truncation and phrase symbols when appropriate to ensure precise and comprehensive results. Results from one research question's search results may be applicable to a different question; therefore the results from the both searches will be combined (using the Boolean Operator OR) so there will be one final search for each database."

Reviewer's comment: Line 202 – if the team members who will do this have already been identified – their initials could be placed in brackets here.

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Author's response: Initials of team members have been added. "Two team members (CM and RP) will review the title, abstract and descriptors of identified citations and apply the inclusion and exclusion criteria discussed below."

Line 214-216 – 'For a study to be included, more than half of the participants will have to be elderly' – the issue for me is not the percentage of the number of participants included in a study but whether or not the results relating to your population under study are presented separately or can be easily extracted from the paper. If this is not the case then the study would be useless to you and shouldn't be included.

Reviewer's comment: Please revise lines 214-416. Please also detail in the inclusion/exclusion criteria what you mean by a tool that has been 'validated'.
Author's response: This section has been revised to read: "For a study to be included, more than half of the participants will have to be elderly, defined as individuals of a median or mean age of ≥65 years of age, and residing in a LTC facility defined as a home for residents who are unable to live independently, requiring access to nursing, personal care, support and/or supervision. If a study has participants from multiple populations (e.g., multiple ages or settings), results relating to the population of interest (i.e. residents ≥65 years of age residing in LTC) must be presented separately for the study to be included."
The following statement has been added: "For a tool or model to be considered validated proof of face, construct, or criterion validity must be demonstrated."

Reviewer's comment: Consultation: It is great to see the consideration of consultation with stakeholders – however it is not clear what the consultation feeding in to. The scoping review looks at what is already there. Are you carrying out a consultation to get a sense of what this work already offers for them and also identify areas for future research - if so then great but this is not clear. Consultation would be critical as a move from the review onwards but it is not clear what consultation offers the review itself. Is this review fitting within a larger program of work as a context – if so please make that evident.

Author's response: Thank you for identifying the importance of stakeholder consultation, we are excited to undertake this part of the work. We have revised this section to make the purpose of the consultation clearer. It now reads:
"6. Consultation with stakeholders: We have identified four groups of stakeholders: policy makers, rehabilitation professionals, administrators and health care providers in LTC, and residents and families. During each stage we will consult the stakeholders via video- or teleconference, surveys or one-on-one consultations to identify questions important for decision-making, to get input on key messages and definitions of terms or QIs for PR in the LTC sector, and to identify areas for future research. Additionally, we will hold a one-day stakeholder meeting upon completion of the review that will bring together key stakeholders across multiple disciplines, including policy-makers and knowledge users across PR, OT, nursing and kinesiology within the LTC sector. The stakeholder meeting will serve three purposes: 1) to disseminate the results of the scoping review to key stakeholders, and 2) to engage in a formal consensus process using nominal group technique (21,22) to determine which new or existing outcomes and QIs could be used to evaluate PR in LTC, 3) to identify an additional emerging issues and future research priorities for PR in LTC. The scoping review fits into a larger, evolving program of research focused on improving delivery and evaluation of PR in LTC."

Line 259 – may not will.
Reviewer's comment: Amend line 259.
Author's response: This line now reads: "The review may identify gaps in the literature regarding

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characteristics of PR interventions, the outcomes used to evaluate them and tools to determine eligibility for services."

VERSION 2 – REVIEW

REVIEWER	Tom Crocker Academic Unit of Elderly Care and Rehabilitation, Bradford Insititue for Health Research, United Kingdom Author of the Cochrane review of physical rehabilitation for older people in long-term care. My department is in receipt of funding to develop and test an intervention to increase activity in older people in long-term care.
REVIEW RETURNED	17-Apr-2015

GENERAL COMMENTS	Congratulations to the authors for their comprehensive revision of this protocol. The manuscript is now greatly improved and the focus of the review much clearer. It is slightly concerning that the authors have made such progress with their review while their protocol remains unpublished. I trust the final review will reflect the final protocol! Thanks to the authors for looking at the special issue in the Archives of Physical Medicine and Rehabilitation. The intention was not to suggest that they used the taxonomy but that efforts have been made to describe physical rehabilitation and that doing so is complex. The proposal to group interventions by target (rather than technique) is very reasonable, but seems confused by "multicomponent" (p16, line 265). Can't multiple components address one target and vice-versa? Pp7-8, lines 121-125: Some further work is needed here to distinguish resident level outcomes from facility outcomes. Most of the outcomes described here (e.g. ADL, cognitive function) can be considered at a resident level, so the reason for describing them as facility/system level outcomes should be provided. P8, lines 145-146: There is still some ambiguity here about the aims. "to synthesize evidence regarding both active and passive PR interventions and models of delivery that have been evaluated…" could be interpreted as "evidence of effectiveness". I suggest changing "both" to "which" and dropping "that" P16, lines 267-274: Summarizing and reporting the findings: Research question 2. Since evaluations are likely to measure multiple outcomes, presumably outcomes will be listed (rather than "sorted") multiple times? P16, lines 273-4: If an outcome does not address one of the current QIs, why will it be identified as a research gap?

REVIEWER	Julie Latchem Cardiff University, Wales, UK
REVIEW RETURNED	27-Apr-2015

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GENERAL COMMENTS	This protocol (and the review to come), is now much clearer. I am happy that all of my concerns have been addressed and am very pleased to have had such a thorough response to my review comments. My only remaining thought is - would it also be wise to add 'mixed methods studies' to your inclusion criteria? I wish you well with your review.

VERSION 2 – AUTHOR RESPONSE

Reviewer Name Tom Crocker

1. Congratulations to the authors for their comprehensive revision of this protocol. The manuscript is now greatly improved and the focus of the review much clearer.
Authors' response: Thank you.

2. It is slightly concerning that the authors have made such progress with their review while their protocol remains unpublished. I trust the final review will reflect the final protocol!
Authors' response: We will certainly be following the protocol as is described in the revised manuscript. As was recommended in the previous round of reviews, we revised our search strategy and re-ran the search to capture the breadth of literature and are therefore going through a second round of screening and abstracting.

3. Thanks to the authors for looking at the special issue in the Archives of Physical Medicine and Rehabilitation. The intention was not to suggest that they used the taxonomy but that efforts have been made to describe physical rehabilitation and that doing so is complex. The proposal to group interventions by target (rather than technique) is very reasonable, but seems confused by "multicomponent" (p16, line 265). Can't multiple components address one target and vice-versa?
Authors' response: We agree that the wording of this section was not clear and that the term multicomponent is perhaps not the best term. We have revised it so that we refer to "multi-target" interventions rather than multicomponent – i.e. those interventions that are aimed at improving strength and balance versus those targeted at improving only strength. The section now reads: "The types of PR intervention will be grouped based on the target of each intervention, for example interventions will be grouped based on those targeting strength, balance, aerobic endurance, functional skills training or those that are "multi-target" - involving at least two of the previously mentioned targets."

4. Pp7-8, lines 121-125: Some further work is needed here to distinguish resident level outcomes from facility outcomes. Most of the outcomes described here (e.g. ADL, cognitive function) can be considered at a resident level, so the reason for describing them as facility/system level outcomes should be provided.
Authors' response: Thank you for the suggestion – we have now provided a definition of "quality indicator" in this paragraph as it provides a distinction between resident-level data and facility-level data. Additionally, the previous paragraph contains an argument as to why facility- or system-level data may be useful: "While resident level evaluation is useful for PR treatment planning and evaluation, facility- and system-level evaluation can allow for comparison of outcomes within and across LTC homes, and provide support for quality improvement strategies. Indeed, it has been suggested that measurement of outcomes, processes, and structures at multiple levels of the

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healthcare system are required to facilitate improvement (7, 8)."

5. P8, lines 145-146: There is still some ambiguity here about the aims. "to synthesize evidence regarding both active and passive PR interventions and models of delivery that have been evaluated…" could be interpreted as "evidence of effectiveness". I suggest changing "both" to "which" and dropping "that"
Authors' response: We agree that this statement remains ambiguous and have therefore revised with your suggestions to read: "The aim of the scoping review is to synthesize evidence regarding which active and passive PR interventions and models of delivery have been evaluated, what outcomes and quality indicators have been used to evaluate them and tools or models used to determine eligibility for services."

6. P16, lines 267-274: Summarizing and reporting the findings: Research question 2.
Since evaluations are likely to measure multiple outcomes, presumably outcomes will be listed (rather than "sorted") multiple times?
Authors' response: Yes, articles will be listed multiple times given most will measure more than one outcome and therefore would be listed under multiple domains of the existing QIs. We agree that "listed" is perhaps a better description than "sorted" and have revised the paragraph to read: "The frequency of the constructs and outcome measures used to measure the constructs will be tallied. Interventions will be mapped onto the QI they address by listing the articles by the outcomes measured. For example, if a study measures falls as an outcome that article would be listed under the QI "falls". The articles will be listed under the domains of the existing QIs in Ontario."

7. P16, lines 273-4: If an outcome does not address one of the current QIs, why will it be identified as a research gap?
Authors' response: We agree that research gap is not what we meant here – we have revised the sentence to read: "If an outcome is reported that does not address one of the current QIs it will be identified and articles reporting this outcome will be listed under the domain of the outcome."

Reviewer Name Julie Latchem

1. This protocol (and the review to come), is now much clearer. I am happy that all of my concerns have been addressed and am very pleased to have had such a thorough response to my review comments.
Authors' response: Thank you for your thorough comments which helped us greatly improve our review.

3. My only remaining thought is - would it also be wise to add 'mixed methods studies' to your inclusion criteria?
Authors' response: Thank you for pointing this out – we have added mixed methods studies to our inclusion criteria.

4. I wish you well with your review.
Authors' response: Thank you.

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