Author’s response to reviews

Title: Development and use of a computer program to detect inappropriate prescribing in older adults residing in Canadian long term care facilities

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BioMed Central
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Dear Emma:

Thank you for granting us the extension to allow us to prepare a revised manuscript for your consideration. Several changes to the original manuscript have been made, the majority of which are in response to the reviewer’s comments. In addition, we have reviewed the instructions for BMC Med Journal authors for formatting the manuscript correctly. The changes are as follows:

Reviewer 1:
Compulsory Revisions:

1) The word "decrease" was removed from the last line and replaced by: "this tool may be used to identify potentially inappropriate drug combinations...".

2) The term 'validity' was used because we wanted to determine if the computer program measured exactly what it should be measuring - the number and type of inappropriate prescriptions (its accuracy). However, we agree that 'reliability' would be the better term since we are comparing our search with manual abstraction. For consistency, we replaced validity with 'reliability' throughout the document.

3) Medical Pharmacies Incorporated provides service to over 200 long term care facilities in Ontario of various sizes. MPI can be considered the largest provider to long term care facilities in Canada. It also provides service to retirement homes. MPI volunteered their services for this study. We have
noted this information under Study Design. In terms of generalizability, we believe that the type of pharmacy that services the long term care facility is irrespective of this because prescriptions that the pharmacy receives are dependent on the physician prescribing, not the pharmacy facility, and will vary from area to area.

4) Methods: We expanded Table 2 to state the original criteria, and how we operationalized them using drug prescriptions as surrogates. This will give readers a better understanding of exactly how the criteria were modified.

Discretionary Revisions:

1) It was noted that the institutionalization rate is for the U.S.

2) Further information was added to make a stronger case for the significance of the study. First, computerized tools have been used in acute care, however, this is an emerging field in long term care with limited data. Second, the magnitude of the problem of inappropriate prescribing is greater in long term care and the consequence of inappropriate prescribing are far greater due to the frail elderly population. Last, due to the prevailing problem of staff shortage in long term care, an automated, accurate computer program would be an inexpensive and efficient alternative. This was added to the Conclusions section, since this section must clearly explain the importance and relevance of the research.

3) Further information was added on the manual search. Each assistant reviewed each chart independently with an abstraction form and were provided with a brief training session on abstraction of variables by a pharmacist.

Reviewer 2:

Given the extent of the assumptions made about the McLeod guidelines, we have ensured that the word "potential" is added to inappropriate prescriptions, throughout the manuscript.

Compulsory Revisions:

1) Abstract - Results section -last sentence- "the most common inappropriate prescriptions....". This sentence was clarified to explain what type of psychotropic inappropriate prescriptions were most common.

2) Page 5- 2nd paragraph: The "study" was changed to "studies" as appropriately outlined by the reviewer.

3) Page 5-4th paragraph: The term 'reliability' was added throughout the manuscript as suggested by Reviewer 1.

4) Page 7-2nd paragraph: We feel that the overlap in indications is a problem certain criteria, but not all, which we outlined in the limitations. In the limitations of the discussion, we have identified that some surrogates are better indicators of disease states, and have discussed the ramifications of this.

5) Modifying the criteria: It is acknowledged that we have effectively removed osteoarthritis from the criteria, which should now read: "Prescription of NSAIDS for patients with a history of peptic ulcer". This is a modification of the guideline and we acknowledge this in the new revised Table 2. It is assumed that it is the prescription of NSAIDS together with the ulcer that is important, not the indication for the NSAIDS (i.e. osteoarthritis). We have now addressed this differently in the
Methods, under Classification of Inappropriate Prescriptions, since it is separate from the issue of surrogate markers.

We have also noted the above issue with the other criteria according to Table 2 (i.e. "B-Adrenergic blocking agent to treat hypertension for patients with history of asthma or COPD). We note that the table points out this assumption, but also added the assumption to the text in the methods section.

6) Page 10, third paragraph: 5th Line: We have changed the sentence to reflect the reviewer's comment to: "prescribed in combination with diuretics indicating a history of heart failure or hypertension... and..proton pump inhibitors indicating a history of peptic ulcer disease." since this is an assumption based on the surrogates.

7) Page 10 and 11: This paragraph was modified to more clearly communicate the percentage of inappropriate prescriptions within categories. Numbers and percentages are now expressed out of the total number of inappropriate prescriptions identified.

8) A case by case comparison was made between the computer and manual abstraction. Thus, it is appropriate to conclude that "the computer program identified all of the inappropriate prescriptions.".

9) Page 12, 2nd paragraph: We have inserted 'modified' before McLeod guidelines.

10) A further description was added to the limitations regarding the impact of surrogate markers as per comment 4.

11) Table 2: We have added the symbol (#) at the requested locations of the reviewer.

Discretionary Revisions:

1) Page 6 Methods and Page 14 Limitations: We included the definition of long term as 2 weeks in Methods section.

2) Page 8-3rd paragraph: The independent research assistants review was expanded further, in addition to comments from Reviewer 1.

3) Page 13-1st line: We feel this sentence is most appropriate in the current paragraph.

4) The shortened version of the McLeod guidelines (14-15) is similar to our modified guidelines, in some ways. For example, one modified recommendation that they made was "prescription of long half-life benzodiazepines", without the inclusion of insomnia. Also, another modified recommendation "thiazide diuretics in patients with gout" is similar to ours, in that 'hypertension' was not included in this recommendation. Their guidelines, however, do not include prescription drug markers as surrogates for disease states.

Sincerely,

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