Author's response to reviews

Title: Medication reconciliation at hospital admission and discharge: insufficient knowledge, unclear task reallocation and lack of collaboration as major barriers to medication safety

Authors:

Nelleke van Sluisveld (n.vansluisveld@iq.umcn.nl)
Marieke Zegers (m.zegers@iq.umcn.nl)
Stephanie Natsch (s.natch@akf.umcn.nl)
Hub Wollersheim (h.wollersheim@iq.umcn.nl)

Version: 2 Date: 21 May 2012

Author's response to reviews: see over
May 21, 2012

Dear Editor,

We would like to resubmit the manuscript:  
‘Medication reconciliation at hospital admission and discharge: insufficient knowledge, unclear task reallocation and lack of collaboration as major barriers’ (MS:8908511650394783)

We thank the reviewers for their valuable comments. These comments certainly helped us to improve the manuscript. We carefully changed the text and tables as advised by the reviewers. We attached the document in which the authors give a point-by-point response to the reviewers’ comments.

We look forward to your response.

Yours sincerely, on behalf of all co-authors,

Prof. Hub Wollersheim, MD PhD  
Professor of quality improvement research and MD in Internal Medicine  
Catholic University Leuven  
Scientific Centre Quality of Care  
Kapucijnenvoer, B-3000, Leuven, Belgium  

Radboud University Medical Centre Nijmegen  
IQ Healthcare  
Geert Grooteplein 21  
PO Box 9101, 114  
6500 HB Nijmegen  
The Netherlands  
Tel: 0031243614227/Fax: 0031243540166  
Email: h.wollersheim@iq.umcn.nl
Medication reconciliation at hospital admission and discharge: insufficient knowledge, unclear task reallocation and lack of collaboration as major barriers to medication safety
Nelleke van Sluisveld, Marieke Zegers, Stephanie Natsch and Hub Wollersheim

<table>
<thead>
<tr>
<th>Comment number</th>
<th>Comments of the reviewers</th>
<th>Revision/comments of the authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ethics statement: Research involving human subjects (including human material or human data) that is reported in the manuscript must have been performed with the approval of an appropriate ethics committee. Research carried out on humans must be in compliance with the Helsinki Declaration (<a href="http://www.wma.net/en/30publications/10policies/b3/index.html">http://www.wma.net/en/30publications/10policies/b3/index.html</a>). A statement to this effect must appear in the Methods section of the manuscript, including the name of the body which gave approval, with a reference number where appropriate.</td>
<td>Because we only interviewed healthcare professionals, policy makers and researchers and no patients, no ethical approval was necessary according to Dutch law. We added the following sentence in the methods section in paragraph ‘study design’: ‘Formal ethical approval was, according to the Dutch law, not needed for this study.’</td>
</tr>
<tr>
<td>2</td>
<td>Consent statement: Please state in the Methods section whether written informed consent for participation in the study was obtained from participants or, where participants are children, a parent or guardian.</td>
<td>We involved healthcare professionals, policy makers and researchers in this study; patients and children were not involved. We asked verbal informed consent from the healthcare professionals, policy makers and researchers which was recorded with a tape recorder. We added the following sentence in the method section, paragraph ‘data collection’: ‘The interviewees were informed about the study and its aim by email. At the beginning of the interview, the interviewees confirmed their willingness to participate and gave verbal informed consent.’</td>
</tr>
</tbody>
</table>

**Associate Editor's comments**

| 1              | The introduction is too long. Please re-write to make it more succinct to convey the importance of the research. | We rewrote the introduction (from 601 words to 577 words) to make it more succinct. |
| 2              | Please describe the bundle intervention for medication reconciliation that was prescribed the Dutch Hospitals | The Dutch bundle intervention for medication is described in the second paragraph in the methods section, called ‘the Dutch bundle intervention for medication reconciliation’ and in table 1 called ‘The bundle for medication reconciliation at hospital admission and discharge as defined in the Dutch Patient Safety Programme’. |
| 3              | Please describe how the interview participants were selected | We used the principles of ‘purposeful sampling’ to pursue a maximum variation in participants and their perceived barriers and drivers (Giacomini, 2009). We added the following sentences in the paragraph ‘Interview participants’: ‘To ensure maximum variation in participants and their perceived barriers and drivers the principles of ‘purposeful sampling’ were applied’ |
| 4              | In the results section, it is difficult to determine who the quotes are from. In addition, it is difficult to determine whether the paragraph below the quote is a summary or interpretation of that domain. This should be more explicit | We added per quote the discipline of the interview partner. We interviewed several persons and we chose to display the most prominent quotes in the results section. The text below the quotes is a summary of quotes from all interviews. The text is not an interpretation of that domain, but results of the interviews. Interpretation of the results belongs to the discussion. |
After reading through your manuscript, we feel that the quality of written English needs to be improved before the manuscript can be considered further. We advise you to seek the assistance of a fluent English speaking colleague, or to have a professional editing service correct your language. Please ensure that particular attention is paid to the abstract. For authors who wish to have the language in their manuscript edited by a native-English speaker with scientific expertise, BioMed Central recommends Edanz (www.edanzediting.com/bmc1). BioMed Central has negotiated a 10% discount to the fee charged to BioMed Central authors by Edanz. For more information, see our FAQ on language editing services at http://www.biomedcentral.com/info/authors/authorfaqs#12.

The manuscript is now edited by a native speaker.

Please note that we are unable to display vertical lines or text within tables, no display merged cells: please re-layout your table without these elements. Tables should be formatted using the Table tool in your word processor. Please ensure the table title is above the table and the legend is below the table. For more information, see the instructions for authors on the journal website.

We changed the tables.

Reviewer 1 (Discretionary Revisions)

1 Medication errors are a leading cause of patient injury and medication reconciliation is a strategy known to decrease the rate of medication errors. In 2007, the Dutch government launched a patient safety program in hospitals, which included a bundle intervention concerning medication reconciliation. The aim of this study was to gain an understanding of the barriers and facilitators that influence the implementation of the mandated bundle intervention. This is an important qualitative research study as implementation of this patient safety program has yet to be completed. Lessons learned can be applied to improve the adoption of the medication reconciliation bundle intervention throughout Dutch hospitals.

The involved policy maker is advisor for healthcare providers in the hospital regarding quality and safety issues. She advises hospital departments and healthcare providers how to implement the 10 safety themes of the Dutch Patient Safety Programme in hospitals.

Medication reconciliation is one of the themes. We included this policy maker, because she advises healthcare providers about problems around the implementation of medication reconciliation. The researcher observed at several wards how physicians and nurses carry out the different steps of the medication reconciliation process. She observed that healthcare providers face several problems regarding the implementation of medication reconciliation.

We included the following sentence in the methods section, paragraph ‘interview participants’: ‘In addition we included a policy maker who advises health care providers on quality and safety issues and a quality researcher who observed, on several wards, how physician and nurses carry out the different steps of the medication reconciliation process.’

We analysed health care providers’ experiences of barriers and drivers regarding the implementation of medication reconciliation and did not involve patients. We added the following sentence in the limitation paragraph in the discussion section: ‘neither patients nor GP’s were involved in this study, while medication reconciliation is a multi disciplinary process. Including the patients’ and GP’s perspective would have strengthened the findings of this study.’

2 A theoretical framework based on Cabana and Grol was used to classify barriers and facilitators. There was no information provided about the data collection process.

We added a new paragraph ‘data collection’ in the methods section, including the interview guide to give insight into the methodological rigor of assessing the validity of the findings.
Unclear if the data collection process was iterative and emerging. The semi-structured interview guide was not discussed. Additionally, the reader could not assess the methodological rigor of assessing the validity of the findings.

We added the following sentences:

‘Data collection

The interviewees were informed about the study and its aim by email. At the beginning of the interview, the interviewees confirmed their willingness to participate and gave verbal informed consent. The interviews lasted around 50 minutes.

The interviews were semi-structured, containing open questions about specific themes based on the theoretical framework (see data analysis). This enabled the interviewees to talk freely, allowing them to elaborate their personal feelings about the barriers and drivers they experienced. After some introductory questions about the bundle and its implementation, three main questions were asked: ‘According to your experiences, which factors bar the implementation of medication reconciliation at hospital admission and discharge?’ ‘Which factors drive the implementation?’ and ‘How could the implementation be improved?’ Asking open-ended questions allowed the interviewees the freedom to elaborate on those factors that were perceived as most important. Subsequent questions were then asked in order to discuss the factors in more depth and to explore other factors from the theoretical framework (see data analysis).’

The results section was very thorough and comprehensive. Barriers and drivers were identified for each level of the framework. Quotes were provided with interpretation. As a result this section was very long. Table 3 summarized the barriers and drivers classified by theoretical framework succinctly.

The text under the quotes is a summary of the citations from all interview partners. We did not interpret the findings in the results section, but in the discussion section (see reaction of the authors on comment 4 of the associate editor reaction). Findings of qualitative study designs are mostly very comprehensive. We tried to summarise the findings of the study as succinct as possible in the result section and in table 3, without loss of important data.

Discussion and conclusion were relevant and presented in an unbiased manner. Table 4 presents suggested strategies for implementation but limited discussion of these in the body of the article.

We added a paragraph in the discussion section to discuss some of the strategies mentioned in table 4 in more detail. We added the following sentences to the discussion section: ‘Some of the suggestions mentioned in table 4 are discussed hereafter in more detail. Professionals with more awareness of the importance of medication reconciliation are more likely to change their performance. An analysis of the process of medication reconciliation gives insight into the current process of care and its inefficiencies. Collecting feedback about the implementation, and about the reduction in medication errors keeps professionals informed and engaged. A lack of clarity about tasks and responsibilities can be resolved with a clear written policy. Research into the effectiveness of task reallocation of the medication history taking to pharmacy technicians should be emphasised. They are most specialised in relation to their lower salary, probably leading to higher cost-effectiveness. A lack of collaboration between the many health care providers involved in medication reconciliation can be addressed by a partnership between hospital and community pharmacy providers. This is important to ensure uninterrupted communication both in the inpatient and outpatient settings. Community pharmacies should be considered as a partner in medication reconciliation, especially with regard to high risk patients. Community pharmacies have frequent and direct contact with patients, resulting in a complete overview of patients’ medication history and offers opportunities to educate patients.'
Finally, in every aspect of care patient empowerment will become more and more important. Therefore it is essential to create awareness among patient of the importance of carrying an accurate and up-to-date list of medications. Patients should be encouraged to take their own responsibility. They want to be in control of their own care, and thus in control of their medication.

**Reviewer 2**

First of all, I want to congratulate the authors with an interesting and important article in the field of medication reconciliation. However, the article needs further clarification, especially in the methods and results section.

---

**Major compulsory revisions:**

1 **Introduction:** Previous studies on this topic have been performed as you mention in the discussion. Please state in your introduction why you performed your study and what your study is expected to add in relation to previous studies.

   Previous studies were all done in the U.S. They were not based on a theoretical framework from the field of implementation science. Because the European healthcare setting differs from the U.S. setting, it is important to carry out studies in different settings. We added some sentences in the last paragraph of the introduction section: ‘Comparable articles, all from the U.S., focus solely on organisational aspects and barriers to the patient. By adopting the theoretical framework, we will research a broader spectrum of factors influencing implementation, for example characteristics of the innovation, attitude of health care professionals and the economic, legal and political context.’

2 **Introduction, last paragraph, aim:** add that the barriers and drivers for the implementation process of medication reconciliation are assessed from a healthcare provider view.

   We agree and added this in the introduction section: ‘from the health care professionals perspective’.

3 **Methods, regarding participants:** a) explain why the general practitioner was not included in the interviews as you do include the community pharmacy and both are needed for continuity of care after hospital discharge. b) if participants were in the process of implementing medication reconciliation, to a greater or lesser extent, this could influence their thoughts regarding the needs, barriers and drivers of med. rec. Was there a major difference regarding participants and their experience with med. rec.? c) How did you select participants, which nurses, which policy makers, which community pharmacists.

   a) GPs are indeed important in the medication reconciliation process. They were not included in this study because their role in the Dutch Safety Program Bundle is subservient (See Table 1). We added the following sentence in the limitation paragraph of the discussion: ‘neither patients nor GP’s were involved in this study, while medication reconciliation is a multi disciplinary process. Including the patients’ and GP’s perspective would have strengthened the findings of this study.’
   
   b) All departments experienced more or less the same barriers and drivers despite of their different stages of progress implementing the bundle.
   
   c) See reaction of the authors on comment 3 of the associate editor: We used the principles of ‘purposeful sampling’ to pursue a maximum variation in participants and their perceived barriers and drivers (Giacomini, 2009). We included different professions involved in the implementation process of diverse departments. We added the following sentences in the paragraph ‘participants’: ‘To ensure maximum variation in participants and their perceived barriers and drivers the principles of ‘purposeful sampling’ were applied’

4 **Results, in general:** a) it is unclear to whom the quotes belong. Please specify the profession of the participant and the department if applicable. b) it is not always clear whether the text presented after the quotes is concluded regarding the quote(s) of interviewees or is a general remark/discussion. For example, one policy maker was interviewed, but the next sentence is written in the results, third.

   a) We added per quote the discipline of the interview partner.
   
   b) See reaction of authors on comment 4 of the associate editor. We interviewed several persons and we chose to display the most prominent quotes in the results section. The text below the quotes is a summary of quotes of all interview partners. The text is not an interpretation of that domain, but results of the interviews. So,
<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Text</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>paragraph: &quot;due to the rather thin evidence it was not possible for policy makers to impose one specific way...&quot; (are these the policy makers in your hospital or policy makers in general). Example two: perceived drivers, second paragraph, the text &quot;involvement of professionals with both a proactive attitude ....&quot;. Is this text based on the quotes or is this a general belief of the authors?</td>
<td>with policy makers, we mention the policy makers interviewed in this study. All text in the results section is about barriers and drivers perceived by the interview partners. There is no interpretation by the authors in the results section. We added the following sentence at the beginning of the results section: ‘Below, the most prominent quotes from the interviewees and a summary of the findings of all the interviews are given.’</td>
<td></td>
</tr>
<tr>
<td>5 Results, section perceived barriers, innovation: the first quote deals about not enough evidence (or not enough usefulness shown) of med. rec. The first quote in the paragraph &quot;the health care professional” assesses the same issue, i.e. not being convinced in the usefulness of med. rec. Please comment what the difference is.</td>
<td>Whether or not the intervention to be implemented is evidence-based, usefulness of the intervention is the perception of the care giver, which is based on more aspects than evidence only.</td>
<td></td>
</tr>
<tr>
<td>6 Results, section drivers, organisation: conflicting quotes with previous quotes. Professionals did not want pharmacy technicians to perform med. rec. Community pharmacies were stripped, so do they have time, even if they receive a reimbursement, to perform med. rec. for every patient. The first conflicting results is discussed, please discuss also the second conflicting result in the discussion section of your article.</td>
<td>The conflicting results you found (community pharmacist have no time for med. rec.) is not apparent from our study. Therefore, we cannot oppose to this comment.</td>
<td></td>
</tr>
<tr>
<td>Minor revisions:</td>
<td>We derived from the interviews that medication education is not always possible, because the patient wants to go home as soon as possible. This is a prioritising problem instead of lack of interest on the patients’ side. We changed this in the text: ‘Moreover, most patients want to go home as soon as possible and therefore they give possibly less priority to being educated about their medications.’</td>
<td></td>
</tr>
<tr>
<td>7 Results, section perceived barriers, the patient: The text as it is presented now concludes that it is a fact that patients want to go home as soon as possible. This is certainly not true for all patients as there are patients who state they need information regarding medication changes. See for example. Borgsteede et al. Information needs about medication according to patients discharged from a general hospital. Patient Educ Couns. 2011;83(1):22-8.</td>
<td>Lack of time and resources are mentioned as barriers and investment in time, effort and resources as drivers by the interviewees and are classified as ‘organization’. The classification ‘economic context’ is at government level Because lack of time and resources is a more generic factor, we mentioned it only as result in table 3.</td>
<td></td>
</tr>
<tr>
<td>8 Results, barriers, economic aspects: lack of time for med. rec. is the barrier that is named most in studies, it is interesting that the authors do not mention this in this paragraph.</td>
<td>We changed this in the text: ‘An economic factor which influences the relationship between, and collaboration with, community and hospital pharmacists is the financial compensation for carrying out medication reconciliation’</td>
<td></td>
</tr>
<tr>
<td>9 Results, barriers, economic, political ..., final paragraph: do not interchange the terms medication reconciliation and medication review.</td>
<td>Lack of financial and personnel recourses are indeed important barriers in most implementation processes and are mentioned by the interviewees in this study (see table 3). We added in the first paragraph of the discussion section: ‘from the health care professionals perspective’.</td>
<td></td>
</tr>
<tr>
<td>10 Discussion, first paragraph: it seems to me that reimbursement and lack of money/personell are important barriers. Were these not mentioned at all? The drivers mentioned MAY benefit the implementation process according to the healthcare professionals. For example, studies have shown that empowering the patient with a medication list does not improve results necessarily.</td>
<td>We added the following sentences in the last paragraph of the introduction section: ‘Comparable articles, all from the U.S., focus solely on organisational aspects and barriers to the patient. By adopting the theoretical framework, we will research a broader spectrum of factors influencing implementation, for example characteristics of the innovation, attitude of health care professionals and the economic, legal and political context.’</td>
<td></td>
</tr>
<tr>
<td>11 Discussion, what new aspect did your study find, when compared to previous studies?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Discussion, limitation: it is not only the selection from one hospital, but also the selection of a limited number of different healthcare providers that may limit generalisability. Do the four clinicians you interviewed, for example, represent the other clinicians of your hospital?</td>
<td>We agree and added the following sentences in the limitation paragraph of the discussion section: ‘The selection of interviewees from one hospital and selection of a limited number of different kind of health care providers might raise questions about the generalisability of our findings.’</td>
</tr>
</tbody>
</table>
| 13 | Introduction, first paragraph, last sentence: not every discrepancy results in adverse drug events. | We agree and changed the sentence in ‘may result’.
| 14 | Methods, regarding the Dutch Bundle:  
  --> add that the bundle, for now, is only for planned admissions and discharges of those planned admissions.  
  --> "the hospital board assigned": specify that these sentences are regarding your hospital. Not in all hospitals, departments themselves are responsible for med. rec. | We added the following sentence in the text: ‘Since 2011, medication reconciliation at hospital admission and discharge has been made compulsory by the government for every planned hospital admission and discharge.’  
We changed the sentence in: ‘The board of the hospital in this study assigned one professional...’ |
| 15 | results and table 2: please use the same headers for your results section as you use in your table for the levels. | We changed the headers in the results section that were not in line with the definitions in table 2. |