Author's response to reviews

Title: Prescriber and staff perceptions of an electronic prescribing system in primary care: A qualitative assessment

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Author's response to reviews: see over
October 1, 2010

Melissa Norton, MD
Editor-in-Chief
*BMC Medical Informatics and Decision-Making*

Dear Dr. Norton:

We are pleased to submit our revised manuscript, “Prescriber and staff perceptions of an electronic prescribing system in primary care: A qualitative assessment”, for consideration for publication in *BMC Medical Informatics and Decision-Making*.

We thank both reviewers for their helpful suggestions and have revised the manuscript accordingly. The most important revision we have made to the manuscript is that we now place our focus group work in the context of the theoretical framework on which we based our study. We had completed this work earlier but, in the interests of manuscript brevity, had set it aside and had not included it in our original submission. Neither have we published this work elsewhere. It is now included herein. To this end, we have brought back the secondary objective to our study; that of mapping the results of our focus groups to the theoretical model. At the end of the Background section we now include a paragraph that describes the theoretical model. We have made corresponding revisions to the Methods/Study Design section and have tied this to the Methods/Analysis section. At the end of the Results section we have added a paragraph that describes mapping of our results to the theoretical model. We have rewritten the first three paragraphs of the Discussion section, presenting them within this framework. These modifications to the manuscript have not changed the substance of our results in any way. They simply describe the theoretical framework on which our work was based, and provide a framework for presentation of the same.

The second revision we have made is that we now triangulate the results of the focus group work with the companion studies we conducted during e-prescribing implementation. This discussion comprises the fourth paragraph of the Discussion. This discussion provides additional depth that is not immediately apparent when presenting the results of the focus group work in isolation. We believe it partially addresses the concerns of the second reviewer about the lack of depth of our original manuscript.

Third, at the suggestion of both reviewers we have made reference to international work in the Background and Discussion sections. To this end, we have added references numbered 12, 18, 53, 54, 56, and 57.

We provide both a tracked-changes and a clean version of the revised manuscript for your convenience.

We hope we have met the spirit of the reviewers’ recommendations and have enjoyed strengthening our manuscript pursuant to these suggestions. Please let us know if we can provide any further modifications.

Thank you kindly for your further consideration.

Sincerely yours,

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Minor essential revisions

In general this is an interesting and well-written paper with some valuable findings. I have the following points that could improve the paper’s message

1. The Introduction provides a valuable overview of the subject material and the issue at hand. It performs a good job at placing the work in the context of what is currently happening in health informatics. However, it could have been strengthened by the addition of some international evidence, which apart from helping to establish the significance of the study, may also help to underscore the value of the findings to the international community.

Authors’ response: The reviewer makes an excellent point. We have revised the Background such that we now include information from a study recently published by this reviewer (Aarts, *Health Affairs* 2009 – reference #12). The article describes the status of computerized provider order entry (CPOE) implementation in seven Western countries, and mentions the status of electronic health records (EHRs), as well. (We have also updated the other references in the Background section so that they reflect the evolving status of ‘Meaningful Use’ and ‘Certification’ criteria.)

To further support the reviewer’s point, we have augmented the discussion so that it now includes other references to international work (references #18, 53, 54, 56, and 57).

2. The Methods section needs some more description of the technical systems in order to improve its value to professionals faced with similar issues. The authors should endeavour to describe how the system works, or intends to work, for whom, where it is being used and how widespread is its use.

Authors’ response: We have added a more detailed description of the e-prescribing system. We have also stated that use was initially voluntary, but was mandated subsequent to completion of the study.

3. The second paragraph of page 7 after the subtitle “Study Design” talks about purposive sampling based on site reluctance. This point needs to be clarified and justified. Did this design help the triangulation and validity of the findings? Did it provide a wider spectrum of opinions? How did the design link to the study objective?

Authors’ response: We appreciate the opportunity to provide additional background and detail about our purposeful sampling methods. To do so, we
have made a few modifications to the Setting and Study Design sections of the manuscript. In the Setting we have added that the e-prescribing system was first implemented in primary care sites and subsequently in specialty care sites. We have added that implementation was initiated first at primary care sites where providers were eager, and provide the rationale for this strategy (that it would set a positive example for those reluctant to adopt). We have also emphasized that initial use was voluntary and later mandated.

With this additional background, we next modified the Study Design section. We provide detail about the study objective that builds on the brief objective described in the final sentence of the Background. We state that our objective was to elicit information about and describe perceptions of primary care prescribers and staff across differing stages of implementation (pre/transition/post) and differing degrees of eagerness to adopt (reluctant to eager). Finally, we state that the results of our focus group work would inform implementation strategies at specialty clinics. We feel that these modifications provide a more thorough and accurate explanation of our purposeful sampling methods.

4. Page 8 (paragraph 2) mentions a “literature-based, semi-structured facilitation technique.” This needs some sort of explanation about what it is and why it was Used. Table 3 does not provide the explanation. The authors also need to describe how this technique related to the “deductive and phenomenologic epistemologic framework” mentioned in the next paragraph.

**Authors’ response:** This recommendation, coupled with the recommendation made by the second reviewer that we construct a theoretical framework, has led us to incorporate into our manuscript information about the theoretical framework on which we based our study. We had completed this work earlier but, in the interest of manuscript brevity, had set it aside and had not included it in our original submission. Neither have we published this work elsewhere. It is now included herein.

In doing so, first, at the end of the Background we have added a secondary objective to our present study - to map our findings to a theoretical model that describes information technology adoption – the Information Technology Adoption Model (ITAM). Second, we have added a section that describes the theoretical model, directly after the Background and before the Methods. Third, we have added a paragraph to the end of the Study Design section that describes how we developed our Semi-Structured Focus Group Questionnaire by mapping pre-existing, literature-based knowledge of the benefits and drawbacks of CPOE/e-prescribing implementation to our theoretical model. Finally, we have added additional detail to the Analysis section that links the theoretical model, existing literature, mapping exercise, and Questionnaire development to the type of coding employed by each coder.

5. The Discussion section needs to be improved. The first three paragraphs seem to be providing more findings rather than answering the question and explaining the significance and meaning of the results. In particular, the authors should address the generalisability of their findings and how they might be applicable to others.

**Authors’ response:** Framing our study within the theoretical model of the ITAM has provided us the opportunity to restructure the Discussion. The first two
paragraphs now summarizes the benefits noted by focus group participants, placing these in the context of the ITAM. The third paragraph summarizes the challenges in a similar fashion. In the fourth paragraph we compare and contrast our focus group results with those from the other three studies we conducted during implementation of the e-prescribing system. We also compare our results with our narrative publication of lessons learned and strategies used that enabled successful implementation. This paragraph provides much substance that corroborates our focus group findings. (It also provides additional depth that the second reviewer was initially wishing we had included in the original manuscript.) In the fifth and sixth paragraphs we compare our results to the work of others and end by suggesting that because of these similarities our findings are generalisable to other ambulatory settings. The final paragraph of the Discussion that describes the limitations and strengths of our study remains the same.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a Statistician.

Declaration of competing interests:

I declare that I have no competing interests.
Reviewer’s report

Title: Prescriber and staff perceptions of an electronic prescribing system in primary care: A qualitative assessment

Version: 2 Date: 21 July 2010

Reviewer: Jos Aarts

Reviewer’s report:

Compared to the number of studies in hospitals electronic prescribing has not yet been widely research in primary care. The authors are therefore to be commended that they conduct an in-depth research of implementing e-prescribing in primary care. The authors collected through focus groups rich data on the different phases of e-prescribing in practice and analyzed prescriber and staff perceptions. I am therefore a bit disappointed that the authors emphasized an overall favorable impression. From a scientific point of view, such a conclusion is not very interesting.

Authors’ response: We appreciate the reviewer’s desire for additional detail about the benefits and drawbacks of e-prescribing implementation and adoption and have modified our work to address this concern. In truth, the overall impression was favorable and The Everett Clinic proceeded with full adoption. We would like to convey this message to readers. Even so, the implementation was not without challenges. We describe these within each theme. The addition of Figure 2: Mapping Results to the ITAM, now lists these benefits and challenges in the Perceived Usefulness and Perceived Ease of Use boxes. This presentation makes the challenges more transparent than does reading about them in the text. In addition, we have added a paragraph that describes the results of our mapping exercise that now forms the final paragraph of the Results. Finally, our Discussion now describes much of the depth the reviewer wished to see in the original manuscript.

It would be much more interesting if the researchers had for example found shifts in workflow and how these impacted prescribing practices. The authors do report a shift of the burden of implementation to the staff and an apparently enhanced role for them, but don’t elaborate on that.

Authors’ response: As above, we have attempted to elaborate a bit on the workflow shift and the burden this created by providing in the Discussion, additional detail about our time-motion study and our narrative of lessons learned. The reader can then easily refer to these other publications to learn additional detail about these issues.
The authors address the intent to implement decision support to generate reminders and alerts and report that physicians might find them useful. They also report that physicians are aware of their potential unintended consequences, but no background how that they became aware of them and how they would respond. I am afraid that such observations are meaningless, because the remarks are in a way rather speculative. Research shows that alerting in hospitals has not been adequately resolved given the high number of overrides. The study might have been more interesting if important subtleties of implementation process would have come to the light and if those subtleties could have been analyzed in the perspective of other studies. In this respect I would like to point to of a process evaluation of the feasibility and acceptance of computerized information system with automated reminders for prescribing in primary care in the Netherlands [1]. It showed a number of problems that need to be addressed before wide-scale implementation could be facilitated.

Authors’ response: We appreciate the reviewer's comments about the challenges inherent in implementing CDS alerts. Because we feel it important to convey that our prescribers were simultaneously enthusiastic and anxious about CDS alert implementation, we retained these comments in Theme 1. Having said that, we appreciate the reviewer drawing our attention to Martens’ article and we now make mention of it in the Discussion, in the context of the brief discussion of CDS alerts.

I will now briefly go over a number of themes that the authors developed from grounded theory.

Theme 1: Why are expectations of the forthcoming implementation of sophisticated CDS part of this theme? The remarks are in a way quite meaningless, because nothing can yet said about the context in which an alert will be generated. The second observation about viewing makes much more sense.

Authors’ response: As above.

Theme 2: The second remark about switching patients seems to be quite important. It begs the question how physician handle multiple patients at the same time. Also I got curious whether changing of prescriptions by patients is a problem.

Authors’ response: We appreciate the reviewer’s interest in this theme. (Perhaps (s)he is referring to the first sentence in Theme 1 that states “staff perceived this enabled them to ….prevent patients from requesting refills…from more than one prescriber concurrently”. We have not changed this wording, as the thrust of the quote was targeted at the ability to view prescriptions from multiple providers for the same patient, rather than prescriptions for multiple patients. Neither did we change the wording about patients modifying their own prescriptions because this information is confidential (although this is a relatively common tactic used by patients who exhibit drug-seeking behavior – at least in the US - and the clinic had experienced this).

Theme 3, 4 and 6 seem to me self-evident and do not raise concerns. Theme 5 however, begs the questions how workflow is changing, to what extent the workload has been shifted and whether the shift has endured after
implementation, or that everything returned to the old situation (except for using the computer system).

Authors’ response: We agree with the reviewer that these are critically important issues, and have revised the text accordingly. With regard to the burden placed on staff during the transition, this is now more clearly apparent as a challenge in Figure 2. Because it was associated with the transition, and because a statement in Theme 7 indicates that it was a lot of work in the beginning, but faster in the end, we felt this was self-explanatory and did not elaborate further.

With regard to the workflow shift of having computers in the examination rooms, we now discuss this in greater detail in the first half of the Discussion where we report and triangulate our own findings. Then, in comparing our work to that of others, we have added statements about and references to the body of literature that explores the important issue of the impact of CPOE on workflow, paying specific attention to work conducted internationally.

I think that grounded theory is a valuable approach, but a-priori theorizing how e-prescribing might impact primary care practices seems to me important in order to interpret the perceptions of prescribers and staff and identify issues that cannot surface by the current research method adopted. I believe that the authors have collected interesting and rich data, but that the theoretical underpinnings are too thin to present an interesting discussion of the findings and make sensible conclusions. I therefore advise that the authors revise the paper to include a theoretical framework that would help to interpret their findings and present conclusions that could be relevant in a scholarly study.

Authors’ response: We wholeheartedly agree with the reviewer. We have integrated into all sections of the manuscript (Background, Methods, Results, Discussion) explanations of the theoretical model on which our work was based. We have detailed these in our responses above.

Reference

Level of interest: An article whose findings are important to those with closely related research interests.

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.