Author's response to reviews

Title: On the alert: future priorities for alerts in clinical decision support for computerized physician order entry identified from a European workshop

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Author's response to reviews: see over
Dear Dr Pala

Thank you for the opportunity to revise our manuscript. Below we provide a detailed response to each of the comments.

Reviewer 1

In this revised manuscript the authors provide a summary of a workshop conducted in Europe on computerized decision support (CDS) in electronic prescribing systems. The manuscript is well-written and provides an overview of the issues related to CDS and the consensus from workgroup discussions related to these challenges. This important topic would be of great interest to the readership of BMC Medical Informatics & Decision Making.

We are grateful to the reviewer for her comments.

Reviewer 2

Major compulsory revisions

Referring to responses to reviewer 2, minor comments, point 4: It may have been the consensus at this meeting, but I believe that it is neither reasonable nor practicable to disregard major medication errors if there is more than one per prescription.

Consider the following simple and realistic example: A patient has a prescription including a) 8 g paracetamol (acetaminophen) per day, b) lisinopril and spironolactone with a current potassium value of 5.5 mmol/l. If you presented this case to several experts, I do not believe that there would be consensus that there should be no immediate alert for one of those medication errors, and even if you were dogmatic about not reporting more than one alert at a time, there would be no rationale regarding which one of those two should be selected with priority.

The author has helpfully uncovered an ambiguity in the meaning of “prescription.” We intend it to mean a single item in a list of prescribed drugs; but it could be taken to mean the entire list of prescribed drugs. We have clarified this in the paper:

“We agreed that ideally alerts should be displayed as early as possible in the prescribing process, and if possible, there should be no more than one alert for any prescription (by which we mean, an order for a single item).”

We understand the reviewer’s implicit point that one alert per prescription may not always be practicable in systems where multiple drugs can be prescribed prior to the invocation of decision
support. Either the system generates an alert item by item (in the reviewer’s example above: an alert for lisinopril being contraindicated in a patient with a high serum potassium concentration is generated and then an alert for spironolactone being contraindicated in a patient with a high serum potassium concentration); or the system accepts the entire list of prescription drugs and issues one alert that says this prescription is contraindicated in a patient with a high serum potassium concentration of 5.5 mmol/l; or one alert for each item lisinopril and spironolactone.

We have added this point to the discussion:

“We discussed a hierarchy of agreed alerts, that is, a grading such as: (i) prescribing absolutely contraindicated; (ii) prescribe but only if certain conditions are met; and (iii) prescribe where benefit outweighs harm. Such a hierarchy would mitigate this conflict, since an alert at the highest level that interrupted the process could be displayed as soon as it was first encountered. However, this may be difficult to achieve in practice. Indeed, depending on the user interface of the computerized system, one alert per item may not be practicable. For example when prescriptions for multiple drug items can entered all together it could be difficult to determine which alert should be selected with priority. New research should focus on assessing the impact of the timing and number of alerts generated during one drug prescription.”

Discretionary revisions

Referring to responses to reviewer 2, minor comments, point 2: Of course, this is quite a challenge because there is no gold standard for the classification and evaluation of potential medication errors, particularly in the absence of patient-specific information; but there are some studies that compared different CDS / information sources with each other or against expert evaluation, therefore providing at least a relative sensitivity / specificity measure. At least some of these could be considered and cited if the authors considered them useful:

We agree that the reviewer cites important papers. However, as it was not a topic of discussion at the workshop, we don’t believe that it is correct to add these comments as it would not be an accurate reflection of the workshop or of the consensus reached by the group.

Thank you again for the opportunity to revise our paper.

Best wishes.

Yours sincerely,

Dr Jamie Coleman