Reviewer's report

**Title:** Systematic Review of Clinical Decision Support Interventions with Potential for Inpatient Cost Reduction

**Version:** 1  **Date:** 10 May 2013

**Reviewer:** Monika Kastner

**Reviewer's report:**

Summary: This was a mixed-methods systematic review of randomized and non-randomized trials of clinical decision support (CDS) systems investigating the potential to reduce inpatient or ED costs, and to identify those that could serve as models for more widespread implementation. Overall, the study methodology is weak and needs work for increased clarity. The main limitations are the single database search strategy and descriptive nature of the analysis with no apparent attempt to explore analyses of available data. The study was not designed to answer authors’ questions. I have provided some clarification below that could be considered to strengthen the manuscript.

General Methods

- What is the rationale for searching only MEDLINE as part of the search strategy? This could potentially exclude a number of relevant articles and limit the interpretation of findings – authors should provide an explanation for leaving out other major databases and other strategies that would comprise a rigorous search strategy – this would have been particularly important since their aim was “to develop a comprehensive catalogue of CDS interventions that have the potential for reducing inpatient costs”
- The detailed search strategy should be included as an appendix
- It’s not clear whether this review is an update of the BMJ 2005 paper or investigating a new question/outcome? If not, authors should provide more detail on the methods
- Study selection and data extraction process are unclear:
  - Were study selection done in duplicate at the title/abstract and full-text levels?
  - Was agreement between reviewers calculated?
  - Was data abstraction performed on standardized forms? Was this done in duplicate?
- Authors list a set of outcomes under “Data extraction”, but it’s not clear what specific primary and secondary outcomes were set a priori – was it cost measures/proxies or cost effectiveness?
- It’s also not clear what cost was measured – was this the cost of the intervention (CDS)? If yes, then the effectiveness of the CDS should also be calculated and reported
• Length of stay and adverse events are not accurate or appropriate proxies of cost
• Were included studies assessed for study quality? They could have used risk of bias and the EPOC criteria for this

Analysis
• Was there no other analysis procedure performed other than a descriptive/narrative summary? Descriptive statistics?; meta-analyses of subgroups (RCTs and non-RCTs or pooled analysis of studies if low heterogeneity); cost effectiveness analyses? Any other potential to explore available data – for eg to calculate cost effectiveness? QUALYs? Difference between clinical foci of CDSs? The types of patients in each or setting where the CDSs were used?
• It would have been important to calculate the effectiveness of these studies in the context of cost/setting/population/aim of CDS
• Also, if authors would have done risk of bias, this would have allowed more comparisons of good vs poor quality studies
• It’s not surprising that so few studies measured the intervention’s impact on cost since this was not an inclusion criteria of the review (and should have been if this was the question)

Results and Discussion
• What about the population? The settings? Interventions across studies? There was no information provided on any of these
• What happened to answer the question whether any of the interventions could serve as models for more wide implementation?
• What are the implications of this study?
• How do findings compare with others investigating CDSs?/costs in inpatient/ED setting?
• How does this work add to current knowledge in this area?
• What are next steps?

Level of interest: An article of limited interest

Quality of written English: Acceptable

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

Declaration of competing interests:
I have no competing interests.