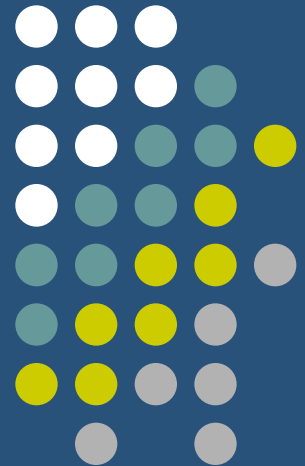


Computerized Clinical Decision Support Systems for Primary Preventive Care: a Decision-Maker-Researcher Partnership Systematic Review of Effects on Process of Care and Patient Outcomes



Nathan Souza, R Brian Haynes, and the CCDSS Systematic Review Team

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Outline

- **Background**
- **Objectives**
- **Method and Partnership Model**
- **Results**
- **Conclusions**



Background I

Six review papers:

- **Primary Preventive Care (PPC) – 41 trials**
- Diagnostic Test Ordering – 34 trials
- Drug Prescribing – 65 trials
- Therapeutic Drug Monitoring – 33 trials
- Chronic Disease Management – 55 trials
- Acute Care – 36 trials



Background II - Review Topic

Computerized Clinical Decision Support Systems for Primary Preventive Care





Background III

Knowledge Translation and Exchange

- **Computerized clinical decision support systems should be rigorously evaluated before widespread dissemination**
- **For those that show promise, a process of local “knowledge translation and exchange” is needed**



Background IV - Timeliness

Timing is favorable for an updated review on computerized clinical decision support systems

- 1) Field of research has matured**
- 2) Planned investments for IT and QA**





Background V - Timeliness

- **Province of Ontario is supporting IT for improving healthcare**
- **Specific decisions that will be made will include computerized clinical decision support**
 - **Best informed by a current systematic review of the best available research evidence**





Objectives

- 1) Update our previously published systematic reviews on the effectiveness of CCDSSs for PPC on process of care, patient outcomes, costs, safety, and provider satisfaction;**
- 2) Partner with senior management and healthcare lead to enhance knowledge translation and exchange**

Methodology*



- A systematic review of RCTs comparing the use of CCDSSs for Primary Preventive Care in any clinical care settings.
- Literature searches up to January, 2010 in Medline, EMBASE, Ovid's EBM Reviews, Inspec, and reference lists.

* Haynes RB, Wilczynski N, the Computerized Clinical Decision Support System (CCDSS) Systematic Review Team. Effects of computerized clinical decision support systems on practitioner performance and patient outcomes: Methods of a decision-maker-researcher partnership systematic review. *Implement Sci* 2010;5:12.



Methods I

- Duplicated screening of RCTs and independent data-extraction using piloted forms that were constructed with decision-makers reaching inter-reviewer agreement $\kappa=0.93$; 95% confidence interval [CI], 0.91-0.94) and a 3rd reviewer resolved disagreements;
- Study authors confirmed extracted data for 88% (36/41) of included trials



Methods II

Data abstracted on:

- trial characteristics
- system characteristics
- **all** reported outcomes with a focus on:
 - 1) ‘process of care outcomes’ (e.g., compliance with guidelines);
 - 2) ‘patient outcomes’ (e.g., cancer survival).



Methods III

- **Binary outcome (effective or ineffective)**
- **Defined in a hierarchical scheme**
 - **Improvement ($p < 0.05$) of a primary outcome or**
 - **If no primary outcome, then improvement in $\geq 50\%$ of multiple pre-specified outcomes or**
 - **If no pre-specified outcomes, then improvement in $\geq 50\%$ of all reported outcomes.**

Methods IV – Quality appraisal



- RCTs were scored for methodological quality on a 10-point scale (an extension of the Jadad scale) with scores ranging from 0 for the lowest study quality to 10 for the highest quality.



Methods V - Partnership Model



Method VI - Decision Makers – Role



| Decision Maker | Position |
|---------------------------|--|
| Murray Glendinning | Executive VP Corporate Affairs Hamilton Health Sciences; CIO for the LHIN |
| Akbar Panju | Co-chair of LHIN's implementation committee |

| Content Area | Decision Maker | Position |
|--------------------------------|-----------------------|---|
| Primary Preventive Care | Rolf Sebaldt | Director; Clinical Data Systems and Management Group |

Roles in the Partnership Model



- **Decision makers guided the review process and provided inputs such as:**
 - **Implementation challenges**
 - **Training**
 - **Maintaining the evidence base**
 - **Customization**
- **Research staff worked in the trenches in close exchange with decision makers**



Results I – Trials characteristics

- 41 RCTs evaluated CCDSS in the global north;
- Quality improved over time;
- 80% (33/41) of trials were publicly funded, 7% (3/41) privately funded, 2% (1/41) both publicly and privately, and 10% (4/41) did not report funding;
- 22 trials (54%) took place mainly in primary care settings, 19 trials (46%) in combined settings;

Results II - CCDSS characteristics



- 22 (54%) studies evaluated multifaceted interventions with ≥ 3 preventive care components;
- 11 (27%) trials assessed 2 components,
- 8 (21%) assessed the effectiveness of a CCDSS with 1 component, typically a reminder.



Results III - CCDSS characteristics

- 20/41 (49%) CCDSSs were integrated with an electronic medical record;
- 21/41 (51%) were stand-alone computer systems
- non-clinician entered data on 29/39 (74%) studies and automatic entry through electronic health records in remaining cases;
- CCDSS were mostly used by physicians solely or sharing with various health providers



Results IV – Effects of CCDSS

- All trials assessed the effects of CCDSSs on processes of care;
- Only 13 (32%) trials reported both process of care and patient outcomes;
- 25 (61%) trials showed improved process of care;
- Only 3 (29%) trials reported improved patients outcomes.



Results V - Effects of CCDSS

- **Cancer screening (10 trials)**
- **Multiple preventive care activities (10 trials)**
- **Screening and management of CV risk factors (9 trials)**
- **Screening and management of mental health-related conditions (6 trials)**
- **Vaccination (3 trials)**
- **Other preventive care activities (3 trials)**

Results VI – Implementation



- Costs of developing, implementing, and maintaining a CCDSS were partly reported in 6/41 (15%) trials.
- Rosser *et al* reported that physician reminder was the most cost-effective method of improving preventive services followed by letter reminder, and telephone reminders;
- Adverse events - only 2 (5%) trials reported CCDSS adverse events;



Conclusion I

- Good evidence on CCDSSs for screening and treatment of dyslipidaemia in primary care;
- Inconsistent evidence for CCDSSs used in screening for cancer and mental health-related conditions, vaccinations, and other preventive care.
- CCDSS effects on patient outcomes, safety, costs of care, and provider satisfaction remain poorly supported.



Conclusions II

Researchers partnering with decision makers to help guide the focus and translation into practice of systematic reviews on computerized clinical decision support systems

- **Is feasible given that local conditions are favourable**
- **May enhance transfer of knowledge into health care practice**



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- **souzanm@mcmaster.ca**

