

The effectiveness of computerized drug-lab alerts: A systematic review

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Trillium Primary Care Research Day

June 8, 2011



Adverse drug events

- ❑ **Definition:** Injuries occurring as a result of medication use
- ❑ **Common:** Occur in 6-7% hospitalizations, 4th-6th leading cause of death
- ❑ Higher prevalence reported in older patients, nursing home patients, patient self report



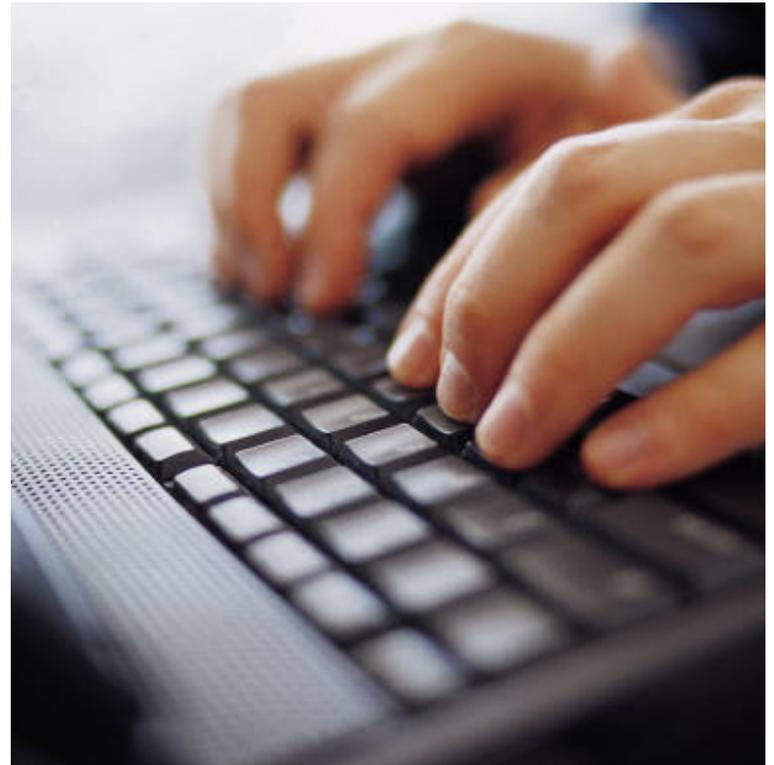
Inadequate Lab Monitoring

- ❑ Ensure that given medication is safe for a given patient
- ❑ Detect adverse drug events
- ❑ 60.8% ADEs in ambulatory care associated with inadequate lab monitoring (including both failure to order lab tests and failure to respond to lab evidence of toxicity)



Electronic medical records and Computer Decision Support

- ❑ Policy makers assume EMRs will improve quality and safety
- ❑ SRs of CPOE & CDSS show mixed results
- ❑ Effectiveness of computerized drug lab alerts is unclear

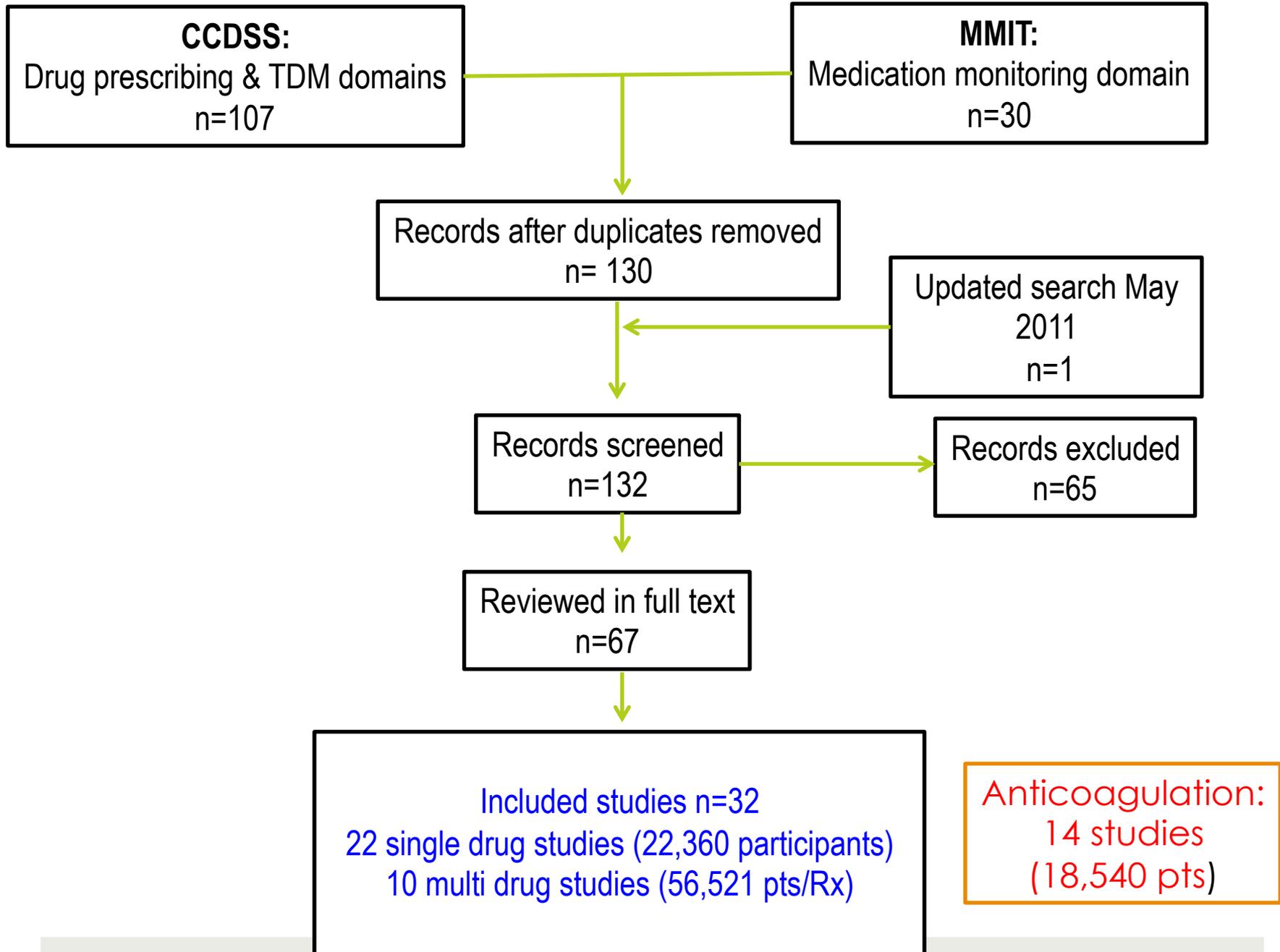


Systematic review

Inclusion criteria:

1. RCT
2. Computerized drug lab reminder systems
3. Participants: prescribing clinicians
4. Outcomes:
 - ▣ Primary: ADE
 - ▣ Secondary: Change in lab monitoring, Change in prescribing, hospitalization, mortality, increased time in therapeutic range, overridden alerts, cost

Exclusion criteria: exclusively students, no clinician decision making, target improved guideline adherence rather than safety



Risk of bias and other methodological issues

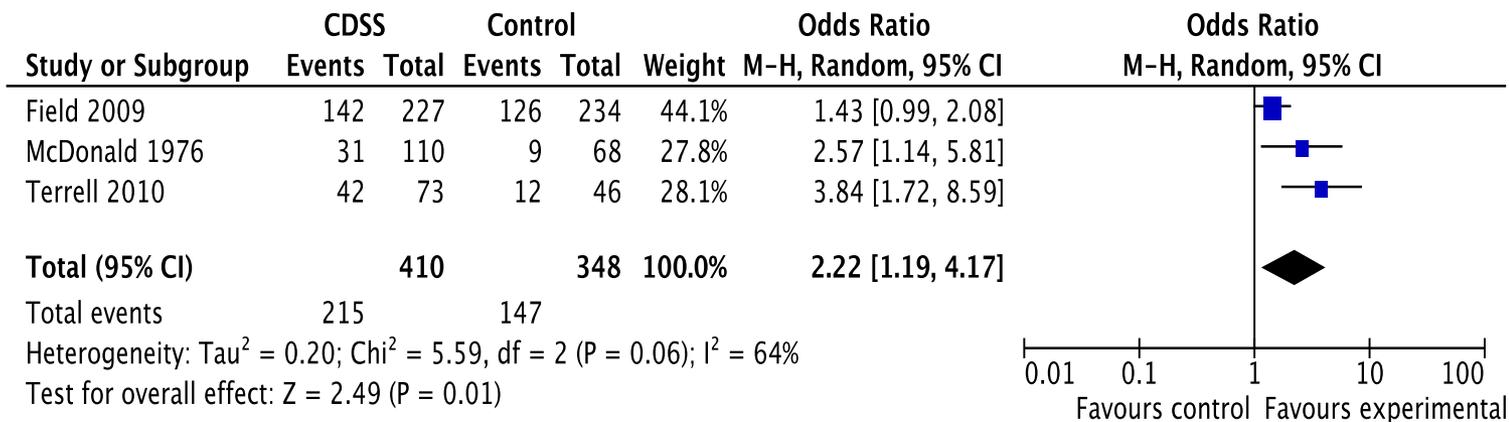
- Blinding
- Contamination
- Few studies gave basic demographic data on healthcare providers who were research subjects

	Adequate sequence generation	Allocation concealment?	Blinding?	Incomplete outcome data a	Free of selective reporting?	Free of other bias?
Agno 1998	?	?	?	?	?	?
Albisser 2007	+	+	?	+	+	?
Carter 1987	?	?	+	?	+	?
Cavalcanti 2009	+	+	?	+	+	?
Claes 2005	+	+	?	+	+	?
Demakis 2000	?	?	?	?	?	?
Feldstein 2006	+	+	+	+	+	+
Field 2009	?	?	?	+	+	?
Fitzmaurice 2000	+	?	?	+	+	+
Judge 2006	?	?	+	+	+	?
Lo 2009	?	?	?	+	+	?
Manotti 2001	?	?	?	+	+	?
Marco 2003	?	?	?	?	?	?
Matheney 2008	?	?	?	+	+	+
McDonald 1976	+	+	?	+	?	?
Mitra 2005	+	?	?	?	?	?
Mungall 1994	?	?	?	?	?	?
Palen 2006	+	?	?	+	+	?
Paul 2006	+	?	+	+	+	?
Peck 1973	?	?	?	+	+	?
Poller 1998	+	?	?	+	+	?
Poller 2008	?	?	?	+	+	?
Raebel 2005	+	?	?	+	+	+
Rood 2005	?	+	?	?	?	?
Saager 2008	?	?	?	+	+	?
Terrell 2010	?	?	+	+	+	+
Tierney 2005	+	+	?	?	+	?
Vadher (BMJ) 1997	+	?	?	?	+	?
Vadher 1997	+	?	?	+	+	?
White 1984	+	?	?	?	?	?

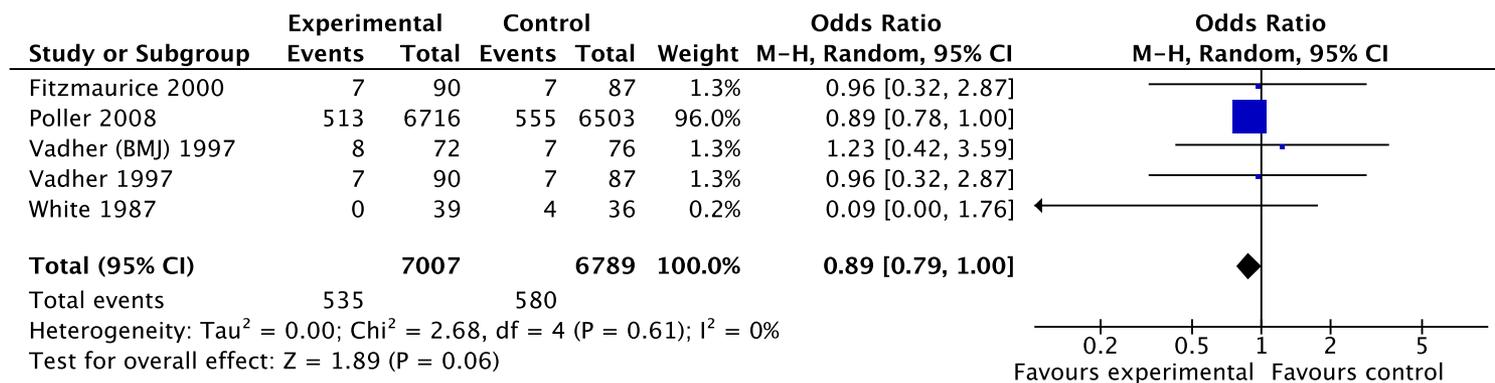
Selected results

Multi drug studies

More appropriate prescribing



Anticoagulation studies: Adverse events



Conclusions



- Moderately strong evidence of improved prescribing and trend suggesting reduction in adverse events in anticoagulation

Future directions:

- Improved methodological rigour
- Focus of patient relevant outcomes
- Impact of new workflows

Thank you!

Questions?

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