

Online Appendix. Characteristics of included systematic reviews

Author, year	Focus of the review	Search period	Number of included studies	Methodological design of the included studies	Setting	Types of assessed CDSS	Stages of the Medication-Use process	Impact of the CDSS for the Medication-Use process	Overall effect of CDSS
Bright, 2012	The effect of CDSSs on clinical outcomes, health care processes, workload and efficiency, patient satisfaction, cost, and provider use	Up to January 2011	148	RCT	Inpatient / Outpatient	NR	Prescribing and administering	Improvement on health care process measures related to performing preventive services ordering clinical studies, and prescribing therapies	+
Carling, 2013	CDSS for medication management in ambulatory care, while intended to reduce prescribing errors	1995-2012	39	RCT, non-RCT, observational studies	Outpatient	- Electronic transmission of individual patients' prescriptions to a pharmacy or digital prescription repository accessible to community pharmacies (e-Rx); - CGPRx	Administering	Insufficient results to prove the efficacy on Medication- use process	0
Chaudhry, 2006	Impact of HIT on Quality, Efficiency, and Costs of Medical Care	1995-2004	257	Descriptive, and comparative studies, and systematic reviews	Inpatient / Outpatient	- Without restrictions by type of CDSS	Prescribing	Improvement on rates of vaccination (pneumococcal, and influenza), and fecal occult blood testing; increase on adherence to guideline-based care; enhance surveillance and monitoring; reduction of medication errors	+
Durieux, 2008	CDSS to guide dose adjustments and their effect on health outcomes	Up to March 2007	23	RCT	Inpatient / Outpatient	- Advice integrated in a CPOE; - Starter	Prescribing and administering	Improvement on quality of prescription; reduction on time to therapeutic stabilization, and on the length of hospital stay	+

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Eslami, 2007	CPOE and CDSS evaluation on: safety; cost and efficiency; adherence to guideline; alerts; time; and satisfaction, usage, and usability	Up to March 2006	30	RCT, non-RCT, and observational studies	Outpatient	- Adherence to guideline; - Alerts;	Prescribing	Insufficient results to prove the efficacy on Medication-Use process	0
Fathima, 2014	Effectiveness of CDSS for asthma and chronic obstructive pulmonary disease in primary care	2003-2013	19	RCT	Outpatient	- Diagnostic advice only; - Drug therapy management only - 'Multi-faceted' interventions	Prescribing, administering, and monitoring	Improvement on quality of prescription	+
Fraccaro, 2015	CDSS of multimorbidity	Up to January 2014	20	No restriction by design	NR	- Prescribing - Clinical guidance diagnosis	Prescribing and monitoring	Improvement on quality of prescription	+
Garg, 2005	Evaluating the benefit of CDSSs on physician performance, and patient outcomes	1998-2004	100	RCT, non-RCT	Inpatient	Varied	Prescribing	Improvement on practitioner performance (diagnostic, reminder, disease management, and prescribing systems)	+
Georgiou, 2013	Effect of CPOE and CDSS on clinical care and work processes in the emergency department	1990 - May 2011	22	RCT, non-RCT	Inpatient	NR	Prescribing	Reduction on prescribing errors, and potential adverse drug events	+
Gillaizeau, 2013	To assess whether computerized advice on drug dosage has beneficial effects on patient outcomes compared with routine care	1996 - January 2013	42	RCT, non-RCT, and quasi-experimental studies	Inpatient / Outpatient	- Prescribing, integrate or not to CPOE	Prescribing	Increased target peak serum concentrations of the drugs evaluated*; it led to a physiological parameter more often within the desired range for oral anticoagulants; it decreased the time to achieve stabilization for oral anticoagulants	+
Hemens, 2011	CDSS for systems for drug prescribing and management	2004-2010	65	RCT	Inpatient / Outpatient	- Prescribing	Prescribing and administering	Insufficient results to prove the efficacy on Medication-Use process	0

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Heselmans, 2009	Effectiveness of computer-based guideline implementation systems in ambulatory care settings with the multidimensionality and real-time interaction with the system during consultation	1990-2008	27	RCT, non-RCT	Outpatient	- Guideline implementation	Prescribing	Insufficient results to prove the efficacy on Medication-Use process	0
Holstiege, 2015	Improving antibiotic prescribing practice	Up to November 2013	7	RCT, and cluster randomized trials	Outpatient	NR	Prescribing	Improvement antibiotic prescribing behavior	+
Hunt, 1998	Evaluating the benefit of CDSSs on physician performance, and patient outcomes	1974-1992	68	RCT	Outpatient	NR	Prescribing	Improvement on physician performance, and on quality of prescription	+
Jamal, 2009	Impact of HIT or HIS on the quality of healthcare, focusing on clinicians' adherence to evidence-based guidelines and the corresponding impact this had on patient clinical outcomes	1998-2008	23	RCT	Inpatient / Outpatient	- Guideline implementation	Prescribing	Improvement on quality of prescription; reduction of number of days of excessive drug dosage, and length of hospital stay	+
Jeffery, 2013	CDSS on diabetes management	Up to January 2010	15	RCT	Outpatient	- Faxed and mailed reminders - Physician alert - Cell phone based system	Monitoring	No positive impact	-
Lainer, 2013	Effects of IT interventions on medication safety in primary care	1976 - December 2010	10	RCT	Outpatient	- Prescribing - PIMS	Prescribing and administering	Reduction on prescribing errors (half of the included studies)	+/-
Lobach, 2012	Characteristics linked to the success of a CDSS	1976 - December 2010	323 articles describing 311 unique studies	RCT, quasi-experimental, and observational studies	Inpatient / Outpatient	- Adherence to preventive care - Ordering a clinical study - Prescribing a treatment	Prescribing	Improvement on quality of prescription	+
Marasinghe, 2015	CDSS on medication safety	1950 – February 2014	7	RCT, cohort, retrospective and prospective studies	Long-term care	- Alert-generating systems - Detection of adverse events	Prescribing and monitoring	Improvement on quality of prescription	+

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Marc, 2013	Acceptance of CDSS by physicians	NR	NR	NR	NR	- Alert-generating systems - Reminders	Prescribing	Insufficient results to prove the efficacy on Medication-Use process	0
Millery, 2010	Evidence regarding health IT and quality outcomes in URSS (underresourced settings)	2004-2009	105	RCT, quasi-experimental studies	Inpatient / Outpatient	- Order entry - Computerized reminders - Patient self-management - Medication reconciliation - Registry - Documentation - e-Prescribing	Prescribing	Improvement on quality of prescription	+
Montgomery, 1998	Use of computers (CDSS) in the detection and management of high blood pressure	1966-1997	7	RCT	Outpatient	NR	Prescribing and administering	Improvement in patient administration, and on physician performance	+
Njie, 2015	The effectiveness of computerized clinical guidelines in the process of preventive care (cardiovascular disease)	Jan 1975-Oct 2012	45	RCT, and non-RCT	Inpatient / Outpatient	Varied	Prescribing a monitoring	Improvement on clinician practices related to screening, clinical tests, and treatments	+
Nieuwlaat, 2011	CDSS on improving of the processes of care or patient outcomes for therapeutic drug monitoring and dosing	Up to January 2010	33	RCT	Inpatient / Outpatient	- Prescribing	Prescribing and administering	Insufficient results to prove the efficacy on Medication-Use process	0
Oluoch, 2012	EMR-based CDSS on quality of HIV care and treatment in resource-constrained settings	Up to January 2012	12	No restriction by design	Inpatient / Outpatient	- EMR-based CDSS (reminders; alerts)	Monitoring	Reduction in data errors, reduction in missed appointments, reduction in missed CD4 results, and reduction in patient waiting time	+
O'Reilly, 2012	Cost-effectiveness evaluation	Up to the summer 2010	31	No restriction by design	Inpatient / Outpatient	- HIT - CPOE	Prescribing and monitoring	Insufficient results to prove the efficacy on Medication-Use process	0

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Pearson, 2009	The impact of CDSSs in targeting specific aspects of prescribing, namely, initiating, monitoring and stopping therapy	1990-2007	56	Quasi-experimental studies	Outpatient	CDSS only/ Multi-faceted	Prescribing and monitoring	Effectiveness on monitoring therapy, particularly using laboratory test reminders, and on drug selection	+
Randell, 2007	Assessing their benefit in nurses' performance and patient outcomes	Up to May 2006	8	RCT, and non-RCT	Outpatient	Varied	Prescribing	Insufficient results to prove the efficacy on Medication-Use process	0
Roshanov, 2011 (1)	CDSS on improving chronic disease management processes or patient outcomes	Up to January 2010	55	RCT	Inpatient / Outpatient	NR	Administering and monitoring	Improvement in processes of care diabetes	+
Roshanov, 2011 (2)	CCDSSs for diagnostic test ordering	Up to January 2010	35	RCT	Inpatient / Outpatient	- Diagnostic test ordering	Prescribing	Improvement on practitioner test-ordering behavior	+
Robertson, 2010	The impact of CDSSs addressing safety concerns (drug interactions, contraindications, dose monitoring and adjustment) and those focusing on medication use in line with guideline recommendations	1990-2009	21	Quasi-experimental	Outpatient	CDSS only/ Multi-faceted	Prescribing	Improvement on quality of prescription, especially on safety issues	+
Sahota, 2011	CCDSSs on improving the process of care or patient outcomes for acute medical care	September 2004-January 2010	36	RCT	Inpatient	NR	Prescribing and monitoring	Improvement on quality of prescription	+
Schedlbauer, 2009	Improving clinician's prescribing behavior	Up to May 2007	20	RCT	Inpatient / Outpatient	Alert-generating systems	Prescribing	Reduction on prescribing errors	+
Shebl, 2007	Supporting the use of antimicrobials	1996-2006	11	RCT, and quasi-experimental studies	Inpatient / Outpatient	- Alert-generating systems - Reminders	Prescribing and administering	Insufficient results to promote the efficacy on Medication-Use process	0
Shojania, 2009	The effects on processes, and outcomes of care attributable to on-screen computer reminders delivered to clinicians at the point of care	Up to July 2008	28	RCT, and quasi-experimental studies	Inpatient / Outpatient	On-screen computer reminders	Prescribing	Insufficient results to prove the efficacy on Medication-Use process	0

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Shojania, 2010	Evaluating the benefit of CDSSs on physician performance, and patient outcomes	1950 - July 2008	28	RCT, and quasi-experimental studies	Inpatient / Outpatient	Computer reminders	Prescribing	Improvement on prescribing behaviors; adherence to target vaccinations; and test-ordering behaviors	+
Sintchenko, 2007	Associating the use of CDSS and improved patient outcomes.	January 1994 - January 2006.	24	Prospective studies	Inpatient	- Alert-generating systems - Reminders	Prescribing	Reduction on prescribing errors	+
Souza, 2011	The effects of CCDSSs for primary preventive care on process of care, patient outcomes, harms, and costs	Up to 2004	41	RCT	Outpatient	- Stand Alone; Integrated with EMR; Integrated with CPOE	Prescribing and administering	Improvement on screening for cancer and mental health-related conditions, vaccinations, and other preventive care	+
Sturzlinger, 2009	Effectiveness and efficiency of CPOE-/CDS-systems and their ethical, social and legal aspects; cost-effectiveness	2002 - October 2007	791	NR	Inpatient	Prescribing	Prescribing	Insufficient results to prove the efficacy on Medication-Use process	0
Tawadrous, 2011	CDSSs on the process of kidney-related drug prescribing	Up to October 2010	32	No restriction by design	Inpatient / Outpatient	NR	Prescribing	Reduction on prescribing errors	+
Vedel, 2013	Application of health information technologies in geriatrics and gerontology (GGHIT).	January 2000 – April 2010	112	RCT, quasi-experimental design, observational study, survey, qualitative, mixed method designs	Inpatient / Outpatient	NR	Administering	Improvement on the clinical process, but the review did not specified them	+
Welch, 2013	CDSS for genetically guided personalized medicine (GPM)	1990-2011	38	RCT, and observational studies	Inpatient / Outpatient	Integrated with primary clinical information system, or stand alone	Monitoring	Insufficient results to prove the efficacy on Medication-Use process (just three studies demonstrated positive results on managing cancer)	0
Wong, 2010	Drug interaction detection software in preventing adverse drug events and determine the	January 1966 -June 2006	4	RCT, and non-RCT	Inpatient / Outpatient	- Drug interaction detection software	Prescribing	No positive impact	-

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Yourman, 2008	Improving the quality of medication prescribing in older adults	January 1980 - July 2007	10	RCT; cohorts; pre/postintervention studies; and interrupted time series (repeated pre/ post interventions)	Inpatient / Outpatient	Varied	Prescribing	Improvement on quality of prescription	+
<p>CDSS: Clinical decision support system; CGPRx: computer generation of paper prescriptions from prescriber's computer; CPOE: Computerized Provider Order Entry; EHR: electronic health record; HIS: health information systems; HIT: health information technology; IT: Information technology; NR: not reported; PIMS: pharmacy information management system; RCT: randomized control trial. * anticoagulants, insulin, aminoglycoside antibiotics, theophylline, anti-rejection drugs, anaesthetic agents, antidepressants and gonadotropins</p>									