Chronic Care Model Decision Support and Clinical Information Systems Interventions for People Living with HIV/AIDS: A Systematic Review

Pasricha A.[4] Deinstadt R.[2] Wilson M.[5,6,7,8] , Moher D.[4,9] Killoran A.[10] Rourke S.[8,11] Kendall C.[1,2,3]

[1]University of Ottawa, Department of Family Medicine, Ottawa, ON. [2]Élisabeth Bruyère Research Institute, Ottawa, ON. [3]London School of Hygiene and Tropical Medicine, London, UK. [4]University of Ottawa, Faculty of Medicine, Ottawa, ON, [5]McMaster Health Forum, Hamilton, ON, [6]Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, ON. [7]Centre for Health Economics and Policy Analysis, McMaster University, Hamilton, ON. [8]The Ontario HIV Treatment Network. [9]Ottawa Hospital Research Institute, Ottawa, ON. [10]National Institute for Health and Clinical Excellence, U.K. [11]The Keenan Research Centre - Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, ON.

PURPOSE: To describe the application and effectiveness of Decision Support and Clinical Information System interventions for persons living with HIV/AIDS, and to identify the successful characteristics of these interventions through a systematic literature review.

STATEMENT OF THE PROBLEM

- With the advent of antiretroviral therapy, HIV infection has become a chronic disease managed primarily in the ambulatory setting
- It is important to understand how the principles of chronic disease management can be applied to people living with HIV/AIDS (PHAs)
- The Chronic Care Model (CCM) is an effective framework for chronic disease management[1]: Decision Support (DS) and Clinical Information Systems (CIS) are two components of the CCM that aim to improve care by changing health care provider behaviour

METHODS

SYSTEMATIC REVIEW WITH THE FOLLOWING INCLUSION CRITERIA:

•Population – Individuals with HIV/AIDS with no restrictions based on age, gender, geography, setting, or transmission group
•Interventions – DS and CIS components of the CCM, categorized according to the Effective Practice and Organization of Care (EPOC) taxonomy of interventions[2]
•Comparators – Usual care or another (non-CCM) intervention
•Outcomes – Immunological/virological, medical, psychosocial, health care process/provider performance, and economic outcomes
•Study Designs – Randomized clinical trials, controlled clinical trials, cohort studies, case-control studies, and controlled before and after designs

RESULTS

Figure 1. Flow diagram of included studies

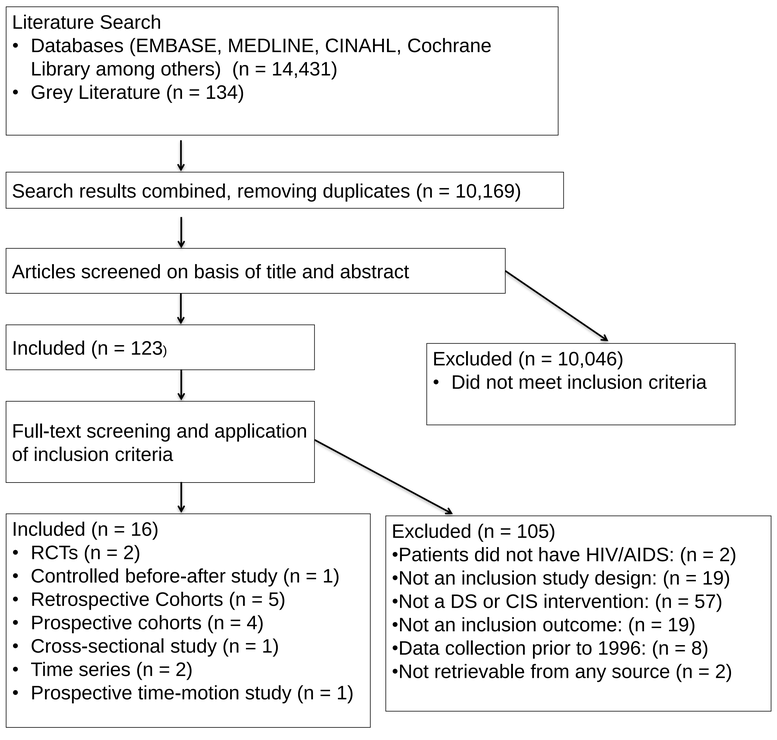

Table 1. Effective Decision Support and Clinical Information Systems interventions characterized by Effective Practice and Organization of Care (EPOC) Taxonomy

	Intervention (n= number of studies evaluating the intervention)	Outcome category (effective interventions /total interventions reported)*					Total
		Immunological/virological	Medical	Psychosocial	Health care process/performance	Economic	
Decision Support (DS)	Distribution of educational materials (n = 1)				1/4		1/4
	Educational Meetings (n=0)						
	Local consensus processes (n=0)						
	Educational outreach visits (n=0)						
	Explicit mention of implementation of guidelines (n = 1)				**4/5†**		**4/5†**
	Local opinion leaders (n=0)						
	Marketing to providers (n=0)						
	Mass media directed toward providers						
	Communication and case discussion (n = 2)	**2/3†**	1/5	**2/4†**			5/12
	Decision Support Total	**2/3†**	1/5	**2/4†**	**5/9†**		10/21
Clinical Information Systems (CIS)	Audit/feedback (n = 2)				1/5		1/5
	Reminders (n = 2)				**9/17†**		**9/17†**
	Changes in medical records systems (n=0)						
	Presence of quality monitoring (n = 2)	0/1			4/10	0/1	4/12
	Reminders AND Changes in medical records systems (n = 3)	**1/2†**	0/1		3/9	**2/4†**	6/16
	Clinical Information Systems Total	1/3	0/1		17/41	2/5	20/50
DS + CIS	Educational meetings AND Audit/Feedback (n = 1)		**1/1†**		**1/1†**		**2/2†**
	Educational meetings, Audit/Feedback, AND Presence of quality monitoring (n = 1)				0/3		0/3
	Explicit mention of implementation of guidelines, Reminders, AND Changes in medical records systems (n = 1)		**1/1†**	**1/1†**	**4/8†**		**6/10†**
	Mixed Interventions Total		**2/2†**	**1/1†**	5/12		8/15
All interventions total		**3/6†**	3/8	**3/5†**	27/62	2/5	38/86

*The proportions indicate the number of significantly improved discrete outcomes reported in the study (studies reported multiple outcomes per intervention).
†Indicates those studies for which ≥ 50% of outcomes were significantly improved

KEY FINDINGS

•8/16 (50%) of studies evaluated interventions for which ≥50% of reported outcomes were statistically improved
•DS interventions: 2/4 (50%) of studies and 10/21 (47.6%) of discrete outcomes within these studies showed improvement
•CIS interventions: 4/9 (44.4%) of studies and 20/50 (40.0%) of discrete outcomes within these studies showed improvement
•Mixed interventions: 2/3 (66.6%)of studies and 8/15 (53.3%) of discrete outcomes within these studies showed improvement
•Most effective interventions were explicit mention of implementation of guidelines (DS) and reminders (CIS)
•62/86 (72.1%) of all reported outcomes across the studies examined health care process/performance measures: improvement was the same for health care process/provider performance outcomes (43.5%) and patient-level outcomes (45.8%).

•Study populations were mostly male and <50 years old, but other equity indicators, including exposure group, ethnicity/race/culture, and socioeconomic factors, were poorly reported

LIMITATIONS

•Methodologically weak primary studies
•Clinical and statistical heterogeneity precluded meta-analysis
•Multifaceted interventions that made interpretation of effectiveness challenging

CONCLUSIONS

•DS and CIS interventions improve outcomes for PHAs
•DS-explicit implementation of guidelines and CIS-reminders were the most effective
•Interventions combining DS and CIS interventions were more effective than those implementing only one CCM element
•These interventions should be considered as part of strategies to improve patient care through changing provider performance

References

1.Improving Chronic Illness Care. www.improvingchroniccare.org.
2.Zwar N, Harris M, Griffiths R, et al. A systematic review of chronic disease management. Research Centre for Primary Health Care and Equity, School of Public Health and Community Medicine. *University of New South Wales.* 2006
3.Tugwell P, Petticrew M, Kristjansson E, et al. Assessing equity in systematic reviews: realising the recommendations of the Commission on Social Determinants of Health. *BMJ.* 2010;341:c4739.

Funding support

Anjori Pasricha received funding from the Élisabeth Bruyère Research Institute for a summer studentship and the Undergraduate Research Opportunity Program (UROP) award from the University of Ottawa. Dr. Claire Kendall received an Ontario HIV Treatment Network Health Care Provider Scholarship and Canadian Institutes of Health Research Fellowship.

OHTN
SOINS CONTINUS Bruyère CONTINUING CARE
INSTITUT DE RECHERCHE ÉLISABETH-BRUYÈRE RESEARCH INSTITUTE
Affilié à l'Université d'Ottawa
Affiliated with the University of Ottawa