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Chronic Disease Management Systems for the Treatment and Management of Diabetes in Primary Health Care Practices in Ontario: OHTAC Recommendation

Ontario Health Technology Advisory Committee

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Conflict of Interest Statement

All authors in the Evidence Development and Standards branch at Health Quality Ontario are impartial. There are no competing interests or conflicts of interest to declare.

About Health Quality Ontario

Health Quality Ontario (HQO) is an arms-length agency of the Ontario government. It is a partner and leader in transforming Ontario's health care system so that it can deliver a better experience of care, better outcomes for Ontarians, and better value for money.

Health Quality Ontario strives to promote health care that is supported by the best available scientific evidence. The Evidence Development and Standards branch works with advisory panels, clinical experts, developers of health technologies, scientific collaborators, and field evaluation partners to provide evidence about the effectiveness and cost-effectiveness of health interventions in Ontario.

To conduct its systematic reviews of health interventions, the Evidence Development and Standards branch examines the available scientific literature, making every effort to consider all relevant national and international research. If there is insufficient evidence on the safety, effectiveness, and/or cost-effectiveness of a health intervention, HQO may request that its scientific collaborators conduct economic evaluations and field evaluations related to the reviews. Field evaluation partners are research institutes focused on multicentred clinical trials and economic evaluation, as well as institutes engaged in evaluating the safety and usability of health technologies.

About the Ontario Health Technology Advisory Committee

The Ontario Health Technology Advisory Committee (OHTAC) is a standing advisory subcommittee of the Board of Directors of Health Quality Ontario. Based on the evidence provided by Evidence Development and Standards and its partners, OTHAC makes recommendations about the uptake, diffusion, distribution, or removal of health interventions within the provincial health system. When making its recommendations, OHTAC applies a unique decision-determinants framework that takes into account overall clinical benefit, value for money, societal and ethical considerations, and the economic and organizational feasibility of the health care intervention in Ontario.

Publishing Health Quality Ontario Research

When the evidence development process is nearly completed, draft reviews, reports, and OHTAC recommendations are posted on HQO's website for 21 days for public and professional comment. For more information, please visit: http://www.hqontario.ca/evidence/evidence-process/evidence-review-process/professional-and-public-engagement-and-consultation.

Once finalized and approved by the Board of Directors of Health Quality Ontario, the research is published as part of the *Ontario Health Technology Assessment Series*, which is indexed in MEDLINE/PubMed, Excerpta Medica/Embase, and the Centre for Reviews and Dissemination database. Corresponding OHTAC recommendations and associated reports are also published on the HQO website. Visit http://www.hqontario.ca for more information.

When sufficient data are available, OHTAC tracks the ongoing use of select interventions it has previously reviewed, compiling data by time period and region. The results are published in the Ontario Health Technology Maps Project Report.

Disclaimer

This report was prepared by the Evidence Development and Standards branch at Health Quality Ontario or one of its research partners for the Ontario Health Technology Advisory Committee and was developed from analysis, interpretation, and comparison of scientific research. It also incorporates, when available, Ontario data and information provided by experts and applicants to HQO. The analysis may not have captured every relevant publication and relevant scientific findings may have been reported since the development of this recommendation. This report may be superseded by an updated publication on the same topic. Please check the Health Quality Ontario website for a list of all publications: http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations.

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Background

The Evidence Development and Standards branch of Health Quality Ontario commissioned the Programs for Assessment of Technology in Health (PATH) Research Institute to conduct a field evaluation[1] (1) to answer the following research questions:

- What was the absolute change from baseline in the proportion of patients in each practice who had up-to-date monitoring of hemoglobin A_{1c} (HbA_{1c}), blood pressure, and cholesterol ("ABC") in practices using a chronic disease management system (CDMS) for 1 year?
- What was the mean change from baseline in up-to-date clinical values for HbA_{1c}, blood pressure, and cholesterol (total cholesterol to high-density lipoprotein cholesterol [HDL-C] ratio, HDL-C, and low-density lipoprotein cholesterol)?
- What was the mean change from baseline in use of other care and treatment elements (foot examination, retinopathy screening, use of angiotensin-converting enzyme inhibitors or angiotensin II receptor blockers, microalbuminuria testing, and documentation of self-management goals)?
- What was the primary health care team's evaluation of Provider and Patient Reminders in Ontario: Multi-Strategy Prevention Tools (P-PROMPT) with respect to Learning, Training, Using, Usefulness, Daily Practice, Practice Planning, CDMS, Support from Service Provider, and Satisfaction?

[1] In the absence of adequate evidence on the safety, efficacy, effectiveness, clinical utility, and/or cost-effectiveness of health interventions, OHTAC may initiate a field evaluation. Field evaluations evaluate health interventions in clinical settings in real time to reduce uncertainty in estimates of effect and to find out how they work in Ontario. They allow patients to access interventions during the evaluation process (known as coverage with evidence development) and provide decision-makers with Ontario-specific evidence prior to making comprehensive funding commitments.

Conclusions

This community-based, real-world evaluation of a web-based CDMS for the treatment and management of diabetes failed to impact physician practice due to limited engagement in the majority of practices. Simply giving health care providers a potentially useful technology will not ensure its use. Organizational readiness and implementation strategies should be developed prior to introducing a CDMS into practice.

Decision Determinants

OHTAC has developed a decision-making framework that consists of 7 guiding principles for decision making and a decision determinants tool. When making a decision, OHTAC considers 4 explicit main criteria: overall clinical benefit, consistency with expected societal and ethical values, value for money, and feasibility of adoption into the health system. For more information on the decision-making framework, please refer to the *Decision Determinants Guidance Document* available at: http://www.hqontario.ca/evidence/evidence-process/evidence-review-process/decision-making-framework.

Appendix 1 provides a summary of the decision determinants for this recommendation.

Based on the decision determinants criteria, OHTAC considered the overall clinical benefit (or lack thereof) in making its recommendations. For the treatment and management of diabetes, the CDMS evaluated in this study failed to impact physician practice as expected.

OHTAC Recommendations

The results of a field evaluation of 1 information system aimed at integrating data for the management of chronic disease[2] demonstrated limited effectiveness in a real-world setting.

1. The Ontario Health Technology Advisory Committee (OHTAC) recommends that information systems for the management of chronic disease be subject to the same rigorous standards of evidence applied to other forms of technology.
2. OHTAC recommends further controlled evaluations of these types of electronic tools, and consideration of how they will operate and integrate with existing e-health technologies.[3]
3. To facilitate such analyses and to improve data quality, OHTAC recommends that the Ontario Ministry of Health and Long-Term Care mandate consistent reporting of laboratory data across the province.

[2]The CDMS evaluated by the Programs for Assessment of Technology in Health (PATH) Research Institute maintained an electronic registry of all patients rostered to a primary care practitioner; could enter individuals into multiple disease registries; and integrated all patient comorbidities and their combined care targets. The key feature of this CDMS was that it acquired and integrated data from external sources and provided data-driven supports to clinicians and patients as a way of fostering systematic and timely treatment.

[3]Further analyses of similar information systems must take account of human factors that play a role in whether and how they are used (e.g., single screen views, ease of data entry).

Appendices

Appendix 1: Decision Determinants

Table A1: Decision Determinants for CDMSs for Diabetes Care in Ontario

Decision Criteria	Subcriteria	Decision Determinants Considerations
Overall clinical benefit How likely is the health technology/intervention to result in high, moderate, or low overall benefit?	**Effectiveness** How effective is the health technology/intervention likely to be (taking into account any variability)?	Uncertain; the technology has the potential, if implemented effectively and used appropriately, to improve compliance with clinical practice guidelines
	Safety How safe is the health technology/intervention likely to be?	The safety of this technology was not evaluated directly
	Burden of illness What is the likely size of the burden of illness pertaining to this health technology/intervention?	The age-standardized prevalence of diagnosed diabetes in Ontario was 6.0% in 2008/09 The age-standardized incidence of diabetes in Ontario showed an increasing trend between 1998/99 and 2008/08, with a rate of 5.7% in 2008/09
	Need How large is the need for this health technology/intervention?	There is a need to increase the number of patients with diabetes in Ontario receiving the recommended frequency of care/monitoring. However, it is uncertain whether CDMSs are capable of improving rates. The current evaluation showed little to no impact of a CDMS on this sort of monitoring. According an Ontario Health Quality Council report, approximately 49% of Ontario patients with diabetes receive the recommended frequency of care. Broken down by measure, 48% receive the recommended frequency of hemoglobin A1c checks; 35% receive the recommended frequency of blood pressure monitoring and medication evaluation; and 64% receive the recommended frequency of cholesterol monitoring and medication evaluation
Consistency with expected societal and ethical values[a] How likely is adoption of the health technology/intervention to be congruent with societal and ethical values?	**Societal values** How likely is the adoption of the health technology/intervention to be congruent with expected societal values?	The adoption of this technology would be congruent with the secular trend toward increasing use of electronic tools to support and improve health care delivery
	Ethical values How likely is the adoption of the health technology/intervention to be congruent with expected ethical values?	Uncertain
Value for money How efficient is the health technology likely to be?	**Economic evaluation** How efficient is the health technology/intervention likely to be?	Uncertain

Feasibility of adoption into health system How feasible is it to adopt the health technology/intervention into the Ontario health care system?	**Economic feasibility** How economically feasible is the health technology/intervention?	Uncertain
	Organizational feasibility How organizationally feasible is it to implement the health technology/intervention?	Not all laboratories provide electronic data feed, presenting a barrier to some practices that use CDMSs In this study, there was significant heterogeneity across sites with respect to data systems and flow of information, making interoperability across practices challenging Some of the data need to be entered into the CDMS manually, and the data entry tasks associated with this CDMS may require double data entry (i.e., electronic medical record and the CDMS), in excess of what can be expected of a busy clinical practice Provision of information and communication technology without considering systemic factors (e.g. health care system readiness) may not produce the desired clinical outcomes and behavioural change

Abbreviation: CDMS, chronic disease management system.
[a]The anticipated or assumed common ethical and societal values held in regard to the target condition, target population, and/or treatment options. Unless there is evidence from scientific sources to corroborate the true nature of the ethical and societal values, the expected values are considered.

References

1. O'Reilly DJ, Bowen JM, Sebaldt RJ, Petrie A, Hopkins RB, Assasi N, MacDougald C, Nunes E, Goeree R. Evaluation of a chronic disease management system for the treatment and management of diabetes in primary health care practices in Ontario: an observational study. Ont Health Technol Assess Ser [Internet]. 2014 April;14(3):1–37. Available from: http://www.hqontario.ca/en/documents/eds/2014/full-report-cdms-diabetes.pdf.

Health Quality Ontario
130 Bloor Street West, 10th Floor
Toronto, Ontario
M5S 1N5
Tel: 416-323-6868
Toll Free: 1-866-623-6868
Fax: 416-323-9261
Email: EvidenceInfo@hqontario.ca
www.hqontario.ca