ICES Institute for Clinical Evaluative Sciences

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June 2003

A Summary of ICES Research Findings for Decision Makers

Diabetes in Ontario: An ICES Practice Atlas

Diabetes Mellitus (DM) is a leading cause of death in Canada. Over 2 million Canadians have diabetes, at an estimated cost of $9 billion annually. In the past several years, there has been a 31% rise in the number of Ontarians living with DM. The expected future growth of DM over the coming decades, due to the aging population and increasing rates of obesity, raises concerns about the impact of the disease on the health of Ontarians and the pressures it will place on our health care resources.

Diabetes in Ontario: An ICES Practice Atlas is the most comprehensive resource on diabetes ever produced in North America, and among the most extensive in the world. The Atlas provides population-based evidence to support policy development, resource planning and care delivery, with a view to improving health outcomes.

Research findings and recommendations focus on:

- Patterns of diabetes in the province (by district health council region and county)
- Acute complications (hospital and emergency department admissions)
- Chronic complications (dialysis, heart failure and heart attack, stroke, amputation)
- Risk factors and health outcomes
- Supply and use of physician, optometry and other health services
- Screening and treatment for eye disease
- Pregnancy
- Children
- Related medication use in the elderly
- First Nations communities

Key Findings and Policy Options

Following is a series of key findings and related policy options to address the serious and growing health problem of diabetes in Ontario.

Key Findings	Policy Options
The number of new cases and total number of Ontarians with DM is increasing, with a particularly high prevalence in the elderly.	Institute an intensive public education and lifestyle modification program to decrease the risk factors for developing DM, most importantly obesity and physical inactivity. This program should be designed with an awareness of the cultural, educational and economic factors that are unique to various segments of the Ontario population.
Smoking, obesity, physical inactivity, high blood pressure, and high cholesterol markedly increase the likelihood that people with DM will develop vascular complications, such as heart attack and stroke. These risk factors are common among Ontarians with DM.	Aggressively implement strategies to promote lifestyle modification (smoking cessation, increased physical activity, a healthy diet) and appropriate medication use (to control blood sugar, blood pressure and cholesterol).
People with DM have a markedly increased chance of having a heart attack or stroke, requiring dialysis, or undergoing an amputation, compared to people without DM. The likelihood of developing these complications can be significantly decreased with more aggressive use of medications to manage blood sugar, high blood pressure, high cholesterol, and protein in the urine. Although the frequency of such medication use is increasing in Ontario, it still lags behind recommended practice.	1) Aggressively disseminate guidelines about ideal medication use in people with DM to physicians (especially family physicians) and patients. 2) Establish risk factor modification clinics throughout the province aimed at people with DM. These clinics could be coordinated by appropriately trained teams of nurse practitioners, family physicians and general internists. 3) Review cost barriers (e.g. co-payments) to the use of drugs and testing agents aimed at blood sugar control and risk factor modification, given that people with DM are often on many of these medications at the same time.

Key Findings	Policy Options
Despite a decrease in the *rate* of complications associated with DM (e.g. heart attacks, end stage kidney disease), the *actual number* of people with complications is increasing. This trend is likely to continue and will place increasing pressure upon the hospital sector.	Regularly monitor the trend in the number of complications over time, and use this information to plan for services in the future, such as dialysis and specialized cardiac procedures.
About 75% of people with DM are managed by their family physician and do not see a diabetes specialist. As the prevalence of DM increases, it is likely that an even greater portion of people with DM will be managed without the involvement of medical specialists.	Tailor educational efforts and guideline dissemination to the needs of busy family practitioners. Risk factor modification clinics should be locally available, as should educators and other health professionals involved in diabetes care.
Continuity of care with a family physician is generally good in Ontario. Those individuals who do not see their family physician regularly are more likely to be admitted with both acute and chronic complications of DM.	1) Ensure that there are sufficient family physicians and appropriately trained nurse practitioners in Ontario to provide good continuity of care to people with DM. 2) Ensure that alternative physician reimbursement schemes adequately account for the intensity of service utilization required by people with DM.
Individuals with lower incomes are, in general, more likely to suffer complications from their DM than those with higher incomes, and are less likely to see a physician regularly.	Target areas of lower socioeconomic status for intensive educational efforts, making sure that these efforts are culturally and literacy-level appropriate. Ensure that individuals of lower income levels are able to afford the necessary medications and blood sugar monitoring devices, and have access to the appropriate health professionals.
Despite excellent evidence that eye screening for diabetic eye disease leads to a decrease in blindness, the frequency of eye examination in Ontario is much lower than suggested by guidelines. In fact, there has recently been a slight decrease in the proportion of people with diabetes undergoing screening eye examinations, possibly related to a change in the OHIP fee schedule regarding coverage for eye examinations.	1) Increase awareness of the need for regular eye examinations by disseminating guidelines to both patients and physicians. 2) Re-evaluate the OHIP fee schedule to see if it has had any unintended consequences. 3) Ensure that there are an adequate number of eye care professionals, trained to examine the eyes of people with DM. Consider greater use of mobile units that take high quality retinal photographs, with subsequent central reading in areas where access to eye care professionals is reduced.
People with DM living in rural or remote communities have higher rates of hospitalization for acute and chronic complications of DM.	Ensure an adequate supply of family physicians and access to diabetes services in all regions of the province.
Women with DM are more likely to have complications in pregnancy, such as pre-eclampsia, high blood pressure, obstructed birth and stillbirth. The frequency of complications appears to be higher in Ontario than in some other countries. While some pregnant women with DM make more use of specialist prenatal and obstetrical care than those without DM, a significant proportion do not.	Determine why some pregnant women with diabetes are not receiving specialist prenatal and obstetrical care, and ensure that such care is made available.
There is no reliable information about the availability of nurse practitioners or diabetes clinics caring for people with DM in Ontario.	Information about the number, location, workload and outcomes associated with these health care professionals needs to be collected on a regular basis. These groups should be networked with each other, to facilitate sharing of best practices.
Aboriginal people have a high prevalence of DM and its associated complications.	1) Target culturally appropriate preventive and therapeutic interventions to the aboriginal communities, ensuring access to the full range of services needed. 2) Work with First Nations health directors to evaluate the impact of DM in the entire aboriginal population in Ontario and to develop ongoing surveillance programs.

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ICES is an independent, non-profit organization that conducts research, on a broad range of topical issues, to enhance the effectiveness of health care for Ontarians. Internationally-recognized for its innovative use of population-based health information, ICES research provides evidence to support health policy development and changes to the organization and delivery of health care services.