

- “Lifestyle measures, optimized glycaemic control and blood pressure control are applicable to all patients. For patients considered at high risk for a cardiovascular event, recommended treatment is with either angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blocking agents (ARBs), antiplatelet therapy (usually ASA), and lipid lowering therapy (usually statins).”
- The primary lipid target for high-risk persons with diabetes is an LDL-C of ≤ 2.0 mmol/L
- The target BP is $< 130/80$ mm Hg
- *Comment: The therapeutic approach is identical to the typical cardiac client in CR.*
- “Generally, heart failure in people with diabetes should be treated similarly to heart failure in those without diabetes, although comorbidities such as renal dysfunction may be more prevalent in people with diabetes and may influence heart failure drug doses and monitoring of therapy.”
- *Comment: Exercise remains an important intervention for all persons with heart failure. The presence of both conditions requires a very individualized approach to management with frequent monitoring of symptoms and adjustment of activity and therapies.*

TREATMENT OF DIABETES IN PEOPLE WITH HEART FAILURE

- “Diabetes can cause heart failure independently of ischaemic heart disease by causing a diabetic cardiomyopathy. The incidence of heart failure is 2- to 4-fold higher in people with diabetes compared to those without.”

References

1. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. *Can J Diabetes*. 2008;32(suppl 1): S1-S201.
2. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada: Executive Summary. February 2009. <http://diabetes.ca/files/for-professionals/CP-ExecSummaryEssentials.pdf>

The Ottawa Model for Undiagnosed Diabetes in Hospitalized Patients

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Canada, like the rest of the world, is facing a diabetes epidemic. Within North America, 50% of patients with diabetes are undiagnosed and unaware of their disease.¹ The time between onset of type 2 diabetes and diagnosis is on average 10 years.^{2,3} This delay results in the development of complications such as cardiovascular disease, renal disease, and retinopathy. As diabetes can go undetected for many years, there is also a high likelihood that many hospitalized patients have undiagnosed diabetes. Identification of these individuals allows an opportunity for earlier treatment, a potentially earlier diagnosis of diabetes, and the application of risk-reducing strategies.

Developing the Ottawa Model for Undiagnosed Diabetes

In 2008, Ontario announced the launch of a \$741 million diabetes strategy that aims to prevent, manage and treat diabetes care across

the province. Through the Ontario Ministry of Health Promotion, funding was provided to the investigators to develop the Ottawa Model for Undiagnosed Diabetes (OMUD). This funding allowed endocrinologists in the Champlain District of Ontario to work collaboratively with health services researchers, diabetes educators, nursing leaders, and behavioural scientists to develop a protocol to systematically identify, manage and follow patients with undiagnosed diabetes. The OMUD was created using principles of the widely successful Ottawa Model for Smoking Cessation created by University of Ottawa Heart Institute, that systematically identifies smokers on admission, provides stop-smoking counseling and medication during hospitalization, links the patient back to community resources, and provides follow-up after discharge from hospital.

Researchers will conduct a 26-week prospective cohort pilot study at the University of Ottawa Heart Institute and Ottawa Hospital, to validate

and determine the ‘real-world’ feasibility of a process to systematically identify and manage in-patients with undiagnosed diabetes and to attach patients to diabetes care in the community.

The objectives of this pilot are to:

1. Establish the validity of the OMUD process to identify patients with undiagnosed diabetes;
2. Estimate the prevalence of undiagnosed diabetes on selected hospital units;
3. Examine the effect of the OMUD process on attending physician practices (i.e., proportion of patients for whom bedside glucose measurements are ordered; proportion of patients with a change in therapy for treatment of hyperglycemia);
4. Estimate the effect of hyperglycemia and undiagnosed diabetes on in-hospital outcomes (death, length of stay);
5. Estimate the effect of hyperglycemia and undiagnosed diabetes on outcomes following discharge (death, re-admission, health care utilization);
6. Describe actions taken by patients with undiagnosed diabetes to manage their diabetes in the six months following hospital discharge (laboratory testing, hypoglycemic medications, diabetes education, GP and community care contacts);
7. Describe blood glucose and hemoglobin A1C levels in patients with undiagnosed diabetes, six months following hospital discharge;
8. Describe diabetes-related quality of life in patients with undiagnosed diabetes;
9. Describe patient satisfaction with treatment in patients with undiagnosed diabetes.

The Ottawa Model for Undiagnosed Diabetes Pilot Study

As part of the pilot study a research nurse will stratify patients into one of two risk groups (Diabetes Unlikely or Potential Diabetes) depending on results of blood work drawn on admission. Patients in Group 1 (Diabetes Unlikely) will receive no further hospital intervention. Patients stratified into Group 2 (Potential Diabetes) will have a letter placed on their charts informing the attending team that their patient might have diabetes, in addition to recommendations for management based on the Canadian Diabetes Association (CDA)

2008 Guideline for In-hospital Management of Diabetes. At discharge, patients in the “Potential Diabetes” group will be further stratified into two groups based on the initiation of diabetes medications during hospitalization and continuation of diabetes medications post-discharge (i.e. Possible Diabetes or Newly Diagnosed Diabetes). All “Potential diabetes” patients will have a patient-specific letter sent to their primary care provider notifying them that their patient may have diabetes, along with recommendations as per CDA guidelines for further diabetes screening. A personalized letter will also be given to the patient prior to hospital discharge. Post discharge, “Potential Diabetes” patients will receive a maximum of three automated calls over the period of one year, to follow their progress on diabetes re-screening and management. All OMUD patients will be contacted six weeks and six months following hospital discharge to complete blood tests and self-reported questionnaires.

Significance

The growing epidemic of type 2 diabetes with its associated morbidity and impact on health care costs highlights the importance of strategies for early detection and management of diabetes. Hospitalized patients represent a high risk population that is not being systematically screened. This project will yield valuable new information on the characteristics, post-discharge outcomes, and health care utilization of hospitalized patients with previously undetected diabetes. It will also be the first Canadian study to examine a systematic process to diagnose potential diabetes among hospitalized patients and attach them to appropriate community-based care.

References

1. Harris MI, Flegal KM, Cowie CC, et al: Prevalence of diabetes, impaired fasting glucose, and impaired glucose tolerance in U.S. adults. The Third National Health and Nutrition Examination Survey, 1988-1994. *Diabetes Care* 1998; 21:518-24.
2. Harris MI, Klein R, Welborn TA, et al: Onset of NIDDM occurs at least 4-7 yr before clinical diagnosis. *Diabetes Care* 1992; 15:815.
3. Levetan CS, Passaro M, Jamblonski K, et al: Unrecognized diabetes among hospitalized patients. *Diabetes Care* 1998; 21:246.