

Diabetes Care in Nova Scotia



A NEWSLETTER OF THE DIABETES CARE PROGRAM OF NOVA SCOTIA

State of the Art

Hypertension - Why all the Fuss?

“The World Health Organization identifies hypertension as one of the most significant, preventable causes of premature morbidity and mortality in developed countries.”¹

Management of hypertension remains a strong focus for the work of the Diabetes Care Program of Nova Scotia (DCPNS). Recently, the DCPNS, in partnership with Cardiovascular Health Nova Scotia and the Nova Scotia Renal Program, has placed hypertension as a top priority for a provincial initiative. The DCPNS continues to support the Nova Scotia (NS) Diabetes Centres (DCs) by providing focused clinical guidelines for implementation in these settings. The revised *Guidelines for Blood Pressure Monitoring and Education through Nova Scotia Diabetes Centres* is planned for release in early Fall 2009. This “State of the Art” article provides insight into the background and literature that support our continued work in Nova Scotia.

Hypertension is a common but challenging comorbid condition of diabetes. The World Health Organization identifies hypertension as one of the most significant, preventable causes of premature morbidity and mortality in developed countries.¹ Higher rates of hypertension in persons of Aboriginal, African, and South Asian descent increase the risks of cardiovascular disease and stroke in these populations.²⁻⁴ Systolic blood pressure increases with age in both men and women and in most ethnic groups.^{3,5,6}

Hypertension is reported in 28% of Nova Scotia residents, aged 20+. It is slightly higher in females as compared to males in all age categories and varies by age group; peaking in the 75+ age groups at over 75%.⁷ In persons with diabetes, close to 70% have hypertension. Again, rates are higher in females than males across all age categories. Hypertension rates reach over 85% in females with diabetes between the ages of 70-79 and \geq age 85. In younger age groups, 30-39 and 40-49, hypertension is present in 27% and 44% of the population, respectively.⁸

Hypertension continues to be a leading cause of cardiovascular morbidity and mortality, and recommended blood pressure levels are seldom achieved.⁹ The Hypertension Optimal Treatment (HOT) trial indicates less than 30% of hypertensive patients have their blood pressure $<140/90$ mm Hg.¹⁰ In the Canadian Heart Health Survey, 43% of

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Newsletter publication dates:

February, June, and October. Questions or contributions should be submitted at least 3-4 weeks prior to publication.

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people (ages 18-74 years) had an optimal blood pressure (<120/80 mm Hg); and of those with a diagnosis of hypertension, only 13% were below target (defined as 140/90 mm Hg).¹¹ A 1999 study found 57% of men and 42% of women in Halifax County diagnosed with hypertension did not have adequately controlled blood pressure.¹² Recent analysis of DCPNS Registry data (2007) indicated, on average, 50% of adult follow-up cases with Type 1 and 2 diabetes attending DCs had blood pressure within target (<130/80 mmHg). Hypertensive medications were used in 80% of these cases.¹³ This is a marked improvement over data from 2000/01 when 26% had blood pressure within the 1998 recommended target of $\leq 130/85$ mmHg.

There are notable gender differences in diagnosis, treatment, and control of hypertension. Blood pressure is not regularly measured in those that are male, of a younger age, have no family doctor, are of a visible minority ethnic background, or are of Aboriginal descent.¹⁴ The Canadian Heart Health Survey showed men aged 18 to 34 years old had the highest rate of never having their blood pressure measured.¹⁴ As well, close to 50% of Canadians with known hypertension aged 20 to 39 years were not on antihypertensive medication, regardless of the number of other risk factors.¹⁵ Women who are aware and treated for hypertension are less likely to reach target blood pressure control as compared to men.¹⁶

As well, people of African descent are more likely to have hypertension and more likely to receive drug therapy; but less likely to achieve blood pressure control as compared to the Caucasian population.¹⁶ People of African or South Asian descent are three times more likely to have hypertension than Caucasian people.²⁻⁴ As well, people of South Asian descent are Canada's fastest growing immigrant

population.¹⁷ People of African descent have higher rates of morbidity and mortality from diabetes as compared to the general population.¹⁸ Persons of African descent respond better to thiazide, thiazide-like diuretics, or calcium channel blockers than to beta blockers, ACE inhibitors, or angiotension receptor blockers.¹⁹

Hypertension is a significant risk factor for cardiovascular disease (CVD) and the microvascular complications of diabetes.^{1,5,10,20,21} CVD rates are two to four times higher in persons with diabetes than in matched non-diabetes populations.¹⁷ Microvascular complications lead to significant morbidity and mortality; however, the greatest cause of death in people with diabetes is CVD.²² The HOT trial reports for people aged 40 to 70 years that for each incremental increase of 20 mm Hg in systolic BP, or 10 mm Hg in diastolic BP, there is a doubling effect of risk for CVD.^{10,22} Up to 80% of people with Type 2 diabetes will develop or die of macrovascular disease.²³ However, clinical trials of blood pressure control in diabetes have shown a dramatic effect in preventing such serious outcomes. The HOT trial indicates a diastolic blood pressure target of 80 mm Hg significantly reduced risk for cardiovascular death and major cardiovascular events compared to a target of 90 mm Hg.¹⁰

The United Kingdom Prospective Diabetes Study (UKPDS) clearly demonstrated the need for tight control of blood pressure in persons with Type 2 diabetes.²⁴ In this study, "tight" blood pressure control reduced the risk of multiple diabetes endpoints - 32% decrease in deaths related to diabetes; 44% decreased risk of stroke; and a 34% decrease in risk of all macrovascular diseases as well as a significant decrease in the development of retinopathy and proteinuria. This landmark study changed the emphasis of focusing mainly on glycemic

control to prevent diabetes complications to a combined metabolic and cardiovascular risk factor control.²⁴

The UKPDS 10-year follow up established early intensive blood glucose control in people with Type 2 diabetes has sustained and significant effects not only for major diabetes end points, but also for risk on myocardial infarction and death from any cause. This large post trial study demonstrated a 13% reduction in all-cause mortality and a 15% reduction in MI as well as a significant decline in microvascular disease.²¹

Traditional health care programs often lack cultural relevance or culturally appropriate approaches, education techniques, and support. When designing any community-based program, community traditions, cultural dynamics, and influence on the management of chronic disease needs to be considered. The influences of ethnic disparity in hypertension may include socioeconomic resources, health literacy, and barriers to accessing care.

The 2008 CDA Clinical Practice Guidelines¹⁷ and the 2009 Canadian Hypertension Education Program Guidelines²⁵ have made clear and consistent evidence-based recommendations. Diabetes educators, working in a patient-centered team, aiming to lower blood pressure values to target should evaluate blood pressure in an accurate, standard way and report the values to physicians. It will be important to track blood pressure values aggregately to determine the need for targeted population interventions. "A multifaceted, comprehensive approach is proposed because there is no one intervention that will accomplish the goal of improving the health of Canadians through high blood pressure prevention and control."²⁶

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The *Guidelines for Blood Pressure Monitoring and Education through Nova Scotia Diabetes Centres* (release early Fall 2009) focus on implementation of standard blood pressure measuring, recording, reporting, and culturally relevant educational initiatives for persons attending DCs in NS. These recommendations support the self-management component of the chronic care model in keeping with chronic disease management and are consistent with national guidelines. These guidelines are intended to enhance and further build on the work already being completed within the NS DCs. DC staffs are encouraged to implement these guidelines for the management of hypertension within our communities.

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MedicAlert info Accessible to Paramedics in NS

Paramedics in Nova Scotia will soon have access to a patient's MedicAlert Emergency Health Record while on route to the hospital.

The initiative – the first in Canada – allows paramedics to access the potentially life-saving information as part of the electronic patient care record now used by paramedics to chart the care they provide to patients from the field. The \$625,000 project, a collaboration between the Department of Health, Canadian MedicAlert Foundation, and Canada Health Infoway, may be expanded to provide other health care professionals, such as emergency room staff, with timely and secure access to MedicAlert information.

Currently, there are more than 43,500 Nova Scotians enrolled with MedicAlert, a national charity, but thousands more individuals could benefit from the protection that only membership in the national charity can provide. Indeed, we could use your help to ensure more people are aware of the benefits of membership.

“By end of this year, 911 dispatchers and paramedics in Nova Scotia will ask patients if they are a member of MedicAlert so they can access their medical information faster,” says President and CEO Robert Ridge. “Now is the time for us to get the word out that membership in MedicAlert will provide greater protection and enhanced health benefits.”

For more information, please contact www.medicalert.ca or call toll-free 1-800-668-1507.

News from the Care Program

This is the 68th issue of the DCPNS newsletter! Introduced in July 1991, we have produced 4 issues for each of the past 17-18 years. Our new look was launched in July 2007 to very positive response. Earlier this year, we conducted a survey of our key stakeholder group (Nova Scotia diabetes educators) intending to find out the value of the newsletter and how our readers use the content. See the April 2009 issue of the newsletter (2009;17[2]:9) for a brief synopsis of the findings. With overwhelmingly positive feedback, the DCPNS will continue to produce this newsletter but will reduce production from four times a year to three. This will provide the Program staff and our regular contributors with a bit of a break and will also allow us to move the publication dates to less hectic months—February, June, and October.

We continue to invite contributions to the newsletter, as this is what it is all about - sharing. Remember, new approaches and new ideas are always welcome.

Subcommittees and Working Groups

The Diabetic Foot in Nova Scotia: Challenges and Opportunities—Working Group Activities

The eight (8) different tools—The *Diabetes Foot Care Questionnaire*, the *Diabetic Foot Risk Assessment* form, the *Foot Risk Stratification* form, the *Diabetic Foot Referral Algorithm*, *A Patient Foot Care Path*, and risk information sheets (one each for the low, moderate, or high risk foot) are in print and will be posted to our website in mid to late September. Direct distribution to Diabetes Centres and other interested care providers will take place around the same time. Please contact the DCPNS office if you are in need of a supply of these tools. These forms are intended for use across settings and by many different health care providers.

Care of the Elderly with Diabetes Residing in Long-Term Care (LTC) Facilities

We can finally say the pocket-reference tool is in print! As Brenda can attest, it has been a long time coming. This tool, along with the foot assessment/resource tools, will also be posted to the website mid to late September. A small working group has been refining the key messages and developing a dissemination strategy. Tools to assist with dissemination and uptake may include power point slides, the delivery of a webcast for easy access and review, newsletter articles, etc.

Pediatric to Adult Care Transition Working Group

We are moving forward with the *Moving On With Diabetes* transition booklet and the completion/circulation of the transition forms and tools. See pages 6 & 7 for the results from a pilot of these tools at the St. Martha's Regional Hospital Diabetes Centre.

Special Initiatives

Guidelines Review and Revision

This issue's State of the Art article (*Hypertension - Why all the Fuss?*) provides the reader with a look into the literature review of the “soon to be released” DCPNS guidelines. With the assistance of Tina Witherall, our 2004 guidelines have been updated (2009) to reflect the newest information from the Canadian Hypertension Education Program (CHEP) and the CDA 2008 Clinical Practice Guidelines. Other guidelines currently under review include *Dyslipidemia*, *Prediabetes*, and *Triage for Initial and Follow-up Appointments*. Lots of good work has been done to date, with more to come. . .

DCPNS Forms Revision

Revised pregnancy and pediatric forms are currently being printed and should be available on the DCPNS website (pdf version) late September. These forms are also available to the Nova Scotia Diabetes Centres through the DCPNS office. The adult forms and flow sheet are the last to undergo revision but are in the queue. Any changes to the hard copy form of the flow sheet will have major implications for the DCPNS Registry and any reports that it currently generates.

A special thanks to all who provided ideas and suggestions. Cora Lee has provided a bit of insight into the revision process (see page 14). This process is not an easy one, and we thank her for her persistence, insights, and strong leadership.

DCPNS Insulin Dose Adjustment Policies & Guidelines Manual

Work continued over the summer months to complete the review and revision process for the 2009 version of this guidelines manual. Editing changes are underway. Once complete, our Medical Advisory Group will craft the exam questions. Expect the completed manual by early to mid November.

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Surveys

Thanks to all who provided response to the surveys related to the uptake of the *DCPNS Dyslipidemia Guidelines* (released in 2007) and the *Hypertension Guidelines* (released in February 2005). Responses will help us to formulate next steps and see where additional support/emphasis may be required.

Information Gathering – Pump Program

The DCPNS, in conjunction with the Acute and Tertiary Care Branch of the DoH, has been gathering information to help inform a pump document for Nova Scotia. The DCPNS has been in direct contact with front-line care providers in each of four provinces (NL, ON, SK, & BC) that currently provide pumps and pump supplies, as part of a provincial approach, to specified diabetes populations. The lessons learned and insights have been invaluable. We have also held a series of focus groups with diabetes educators (3), parents of children currently using pump therapy (1), pediatricians (2), and the Adult Division of Endocrinology (QEII) to truly understand issues related to current practices and what future processes and access might look like if such a program was to move forward in Nova Scotia.

Registry Enhancements

A new training program is in development for users of the DCPNS Registry. This 3-hour session, delivered on-site by DCPNS staff, refreshes and reviews use of all DCPNS Registry reports while encouraging interpretation and use of the valuable data found within local Registries. Three training sessions in three different DHAs have already been scheduled for early fall. Please contact the DCPNS office to obtain an overview of the training session and to arrange a session for your DHA.

The DCPNS has been working on developing a standard report for DCs that have a pediatric population. This report will provide information relevant to this age group.

Release Diabetes Centres' Diabetes Statistics

In July, indicator reports (including interpretation sheets with summary observations) were released to all Diabetes Centres using the DCPNS Registry during calendar year 2008. These reports demonstrate the value of data collection and improving data quality (more complete capture). It was exciting to see the efforts of programs new to the on-site Registry as they strive to capture key clinical and self-care indicators that can be used to inform future targeted interventions or support changes in program approaches. Programs that have been using the Registry for a number of years are now able to see the results of their efforts to track changes overtime.

Early in September, DCs and DHAs will also receive DC-specific visit statistics—total number of visits, by visit category (newly diagnosed, follow-up, re-referral, etc.), and treatment type. The information compiled for the province will be posted (under statistics) on the DCPNS website in October.

Partnership Projects

Provincial Programs Hypertension Initiative

Stay tuned for upcoming activities related to this initiative. We are currently seeking information on what is being done in other provinces and territories related to sodium reduction/awareness, advocacy, etc.

Development of a Cultural Competence Assessment Tool for Provincial Program Clinical Guidelines

The draft tool, as developed by a consultant and working group, is being reviewed by committee members for final changes. These changes will be discussed at a meeting later in September, along with discussion/decision on next steps. As provincial programs, we are excited to know that the use of the tool and the principles it embodies will help ensure that any development/revision of guidelines considers gender, culture, and/or health disparities (both in context and content). We look forward to a tool that will guide our work and be more reflective of our diverse populations.

Self-Monitoring of Blood Glucose: The Health Care Professional Perspective

With the project work now complete, the partners in this project - DoH (DCPNS and Drug Technology Assessment, Pharmaceutical Services), Dalhousie University (Department of Family Medicine and College of Pharmacy), and the QEII Health Sciences Centre (Drug Evaluation Unit, Pharmacy Department) - are in the process of preparing a manuscript for publication. This work should help to inform groups and individuals involved in the promotion and direct education of self-blood glucose monitoring about the need for consistent messages across disciplines, patient feedback on recorded results, etc.

Development of a Nova Scotia Diabetes Dataset (Repository)

Stay tuned. This project will be highlighted in a future issue of the newsletter. It is complete, it was successful, and there are plans to continue this forward momentum.

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“Upstream” Screening and Community Intervention for Prediabetes and Undiagnosed Type 2 Diabetes

Please see pages 9-10 for a summary (Part 2) of this project.

Quantifying the Burden of Diabetes: Time to Comorbidity and Time to Death

Work with the DCPNS Registry has been ongoing over the summer months. Mapping of the data (accuracy and completeness) in each Registry field is just about complete. We are pleased to share that the accuracy of these data is extremely high (e.g., 99.99% accurate for date of birth - only 7 mistakes in over 70,000 records). This deserves mention as it reflects the suburb job that dedicated DC and central office staff have done with data entry. Work is also started on the indicators for various comorbidities as well as definitions to be used to determine disease severity. We are hoping to move forward with data linkage through September/October.

The Diabetes Physical Activity and Exercise Tool-Kit

In this issue of the newsletter you will find a brief update on what's new and what's about to happen with this project in a section titled “Physical Activity Corner” on page 14.

Diabetes Assistance Program (DAP) for Uninsured Nova Scotians with Diabetes

This project officially ended early this year. Preliminary analysis has been shared with the project partners, and the manuscript is in the works for publication.

Peggy Dunbar
Program Manager, DCPNS

Pediatric Focus

Transition to Adult Care

The change of physician or diabetes health care (DHC) team can have a major impact on disease management and metabolic control in the person with diabetes. “Between 25% and 65% of young adults have no medical follow-up during the transition from pediatric to adult diabetes care services. Those with no follow-up are more likely to experience hospitalization for DKA during this period. Organized transition services may decrease the rate of loss of follow-up.”¹

PATIENTS AND METHODS:

Saint Martha's Regional Hospital Diabetes Education Centre (DEC) currently supports and educates 27 children and adolescents with type 1 & 2 diabetes. Of this total group, 40% or 11 patients were identified as candidates for transitional care. These 11 patients, aged 16-18, were identified as individuals that would be moving on to adult care with various transition scenarios identified - staying in the area or leaving the area for employment or post secondary education.

The diabetes team's (comprised of Pediatrician, RN and PDt) goal was to assess the needs of this group and then to offer education and support regarding issues that may be common to the milestone of transitioning.

A needs assessment was conducted utilizing a checklist developed through expert consensus by the Diabetes Care Program of Nova Scotia (DCPNS). The checklist is entitled *Moving on with Diabetes: Knowledge and Skills Checklist*. It was mailed to all teens with an explanatory letter to be read by parent and teen. We requested the teen review and complete the checklist with a parent and return by mail. All 11 or 100% of the needs assessments were returned. The team reviewed these for consistently identified topics that could be provided in a group setting. The topics that stood out were “Sick Day Management,” “Long-Term Complications,” and “Living with Diabetes.”

INTERVENTION:

A workshop morning was organized. One hundred percent or 11/11 teens attended.

A brief, regular checkup and review of diabetes management was carried out by dividing the group among the three members of the health care team. A “Handheld Record,” developed by DCPNS, was used to document each teens lab results. This was explained in context of adult care or “Moving on with Diabetes” and knowing your results.

The group of 11 then attended presentations with the pediatrician regarding living with diabetes that covered a range of issues related to independence, targets for control, prevention of long-term complications, sexuality, pregnancy, and drugs and alcohol. The PDt and RN presented sick day management and prevention of DKA. These presentations were done with PowerPoint and interactive problem solving. Resource handouts regarding self-care for sick day management were presented in a folder to each participant. Lunch and door prizes were provided during the presentation.

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ASSESSMENT AND RESULTS:

During the workshop, teens asked questions of the presenters and were attentive. Interaction and sharing among teens occurred as some talked freely about their experience with DKA and were honest as to why it occurred (insulin omission). Some problem solving using a sick day scenario elicited responses from the group.

Evaluations were mailed, and the return rate was 36%.

Evaluation Responses:

- 4/4 reported the questionnaire *Moving on with Diabetes: Knowledge & Skills Checklist* was helpful for them and their parents to reflect on what they wanted to know.
- 1 of 4 suggested more selections on the checklist, yet did not specifically identify suggestions.
- 4/4 felt that it helped them understand our goal of getting ready to "Move on" or "Transition" with their diabetes care and management as they finish high school.
- 4/4 found the group session with the pediatrician to be helpful. Specific comments were:
 - "I found it very interesting to learn a lot about my diabetes that I didn't know."
 - "She explained everything clearly."
- 4/4 found the group session with RN and PDt helpful. Comments were:
 - "It will help me have safer sick days."
 - "I already used the new information, and it helped me a lot when I was sick."
- 4/4 stated they have considered self-care changes or steps they might take but did not itemize these considerations.
- 4/4 liked coming together as a group.

Comments were:

- "It made me realize how many teenagers are living with diabetes."
- "It was fun to meet people who are going through what I am going through."
- 4/4 found the day "just right" in terms of length and liked the lunch.
- 4/4 felt their privacy was respected in group.

Future suggestions:

- 2/4 had none and other comments included:
 - "Nothing, I found the presentation to be very well put together, and I learned a lot."
 - "It covered the points that I wanted/needed covered."

A sick day management crossword puzzle has been developed and placed on the participants' charts. It will be presented to each teen at their next follow-up visit to refresh the sickday topic and assess post workshop knowledge.

The needs assessments *Moving on with Diabetes: Knowledge and Skills Checklist* originally completed by all teens has become part of the clinic chart. At follow-up visits, we will identify and discuss other topics that were noted by the individual. This will allow us to continue to support transition for this group.

CONCLUSION:

The goal of assessing the needs of this group was met. The checklist provided a valuable tool for assessing needs and heightening awareness of transition topics among the teens and as well for the health care team. The approach of clinic visit and group education all at same visit was well received. Future clinics using this approach can be a way to meet needs of a

large group while providing information on a number of topics at one visit.

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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): S155.

Practice Point

Q: *We had one of our follow-up type 2 clients referred to our Diabetes Centre (DC) for a possible insulin start. We booked this individual for an insulin instruction appointment. However, following the appointment, he and his physician decided that starting insulin was not a treatment option at this time; and he would continue to take OAs only.*

Should the insulin instruction visit be recorded as an SI for the DCPNS statistics? If not, how should this visit be recorded?

A: **No**, the insulin instruction should not be recorded as an SI (started insulin) visit. The DCPNS is tracking the number of individuals that are **started on insulin**, not the number of instructions (workload). **The visit in question should be recorded as a FUV T2 OA visit only.**

Please refer to the **DCPNS Statistics Trouble Shooting Guide** for answers to other common questions. If you require another copy, please contact the DCPNS office.

Research to Practice

Nutrition and Anti-AGE Therapy

Over the past 15-20 years, there has been increasing emphasis on managing and monitoring of diabetes complications by diabetes educators in Nova Scotia Diabetes Centres (DCs). The *2008 Canadian Diabetes Association Clinical Practice Guidelines* recommend that reduction of cardiovascular risk by vascular protection through a comprehensive, multifaceted approach (lifestyle modification and pharmacology) should be the first priority in the prevention of diabetes complications.¹ This article reviews the interaction of nutrition and the inflammatory process in the development and progression of diabetes complications. Inflammation plays a pivotal role in the development of diabetes complications.

Hyperglycemia activates many biochemical mechanisms in the inflammatory response and accelerates the formation of advanced glycation end products (AGEs). AGEs are the products of nonenzymatic glycoxidation and oxidation of proteins and lipids. The presence and accumulation of AGEs in the cells disrupt intracellular and extracellular structure and function. Through the formation of cross-linkages between molecules on the cells resulting in basement membrane thickening and through interaction with the AGE-specific receptor,

known as RAGE, the AGEs are responsible for activating inflammatory pathways, endothelial dysfunction, and many other adverse effects on the vasculature of people with diabetes. These adverse effects contribute to the development and progression of micro and macrovascular diabetes complications. The endogenous formation of AGEs was believed to take days to weeks. However, in an environment of hyperglycemia and oxidative stress, AGEs formation may take place in minutes to hours. People with type 2 diabetes have significantly higher serum AGE concentrations than do healthy people.²

Although a variety of different compounds are being investigated for inhibiting AGEs formation, this article will concentrate only on nutrition as part of anti-AGE therapy. Traditionally, people with diabetes have been counseled to choose foods such as fruits, vegetables, whole grains, and lean protein foods including meat, poultry, fish, skim or 1% milk, and lower fat cheese. As well, they have been provided information on appropriate food preparation methods, limiting added fat, CHO content and counting, and portion control. How do these nutrition guidelines rate according to AGE production and do exogenous sources of AGEs have any negative impact in the body?

A study was conducted to determine the AGE content of common foods and to evaluate

various methods of food preparation on AGE production. A total of 250 foods were chosen from a hospital cafeteria menu and local restaurants to represent foods and culinary techniques typical of a multiethnic, urban population. Standard cooking times and cooking methods were used: boiling, broiling, frying, and roasting. A daily AGE intake greater than or less than 15,000-16,000 kilounits (ku) defines a high or low AGE consumption respectively. Table 1 provides the AGE content of selected foods. AGE formation in foods during cooking varies based on the following:³

- **Nutrient Composition:** Foods high in fat and protein have the highest AGE content. Carbohydrate foods (vegetables, fruit, starches, and milk) have the lowest AGE content. However, commercially prepared breakfast cereals and snack foods have significantly higher AGE content as a result of the processing methods such as heating at high temperature, extrusion processes at high pressure to produce pellets of different shapes and densities; e.g., ready to eat breakfast cereal.
- **Cooking Methods:** AGE formation is greatest with frying; deep frying; broiling; roasting; boiling; microwaving.
- **Temperature:** Cooking temperature is more critical to AGE formation than cooking time. Broiling for 15 minutes produces more AGEs than boiling or stewing for one hour.

Table 1: AGE Content of Selected Foods (adapted from Goldberg T, Cai W, Peppia M, et al³)

Food Item	AGE (ku)	Food Item	AGE (ku)
FAT (1 tsp)		PROTEIN FOODS	
Butter	1325	Meat (beef, poultry) 100g	
Margarine	875	Boiled x 1 hr	1650 (avg.)
Olive oil	600	Broiled x 15 min	5850 (avg.)
STARCHES		Fried x 6 min (hamburger)	2639
Bread, whole wheat (30g)	16	Fried x 15 min (chicken breast)	6122
Potato, boiled x 25 min (100g)	17	Cheese 60g	
Potato, french fries, fast food (100g)	1522	America cheddar	5220
White rice, cooked x 35 min (100g)	9	Mozzarella, part skim	1006
Pasta, cooked x 8 min	112	Fish	
FRUITS & VEGETABLES		Salmon, breaded, broiled x 10 min	1400
Raw 100g	15 (avg.)	Tuna, canned	1700
Vegetables grilled	2400 (avg.)		

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A randomized crossover design study was conducted to investigate the acute effects of a high AGE (HAGE) and a low AGE (LAGE) “real life” meal on postprandial oxidative stress and vascular endothelial dysfunction in people with type 2 diabetes. Twenty people with type 2 diabetes, aged 41-71 years, were recruited from a group of inpatients. A standard diabetes diet was given to the participants over a 6-day period. On day 4, a single LAGE meal was consumed and on day 6, a single HAGE meal was consumed. Vascular function was assessed after an 8-hour overnight fast, then 2, 4, and 6 hours after the test meals. The test meals were isocaloric, had identical ingredients, and differed only by the temperature and time of cooking. The HAGE meal showed significant impairment of vascular function in comparison to the

LAGE meal. As well, markers of oxidative stress increased significantly with the HAGE meal in comparison to the LAGE meal. More research is needed to determine if a chronic HAGE diet, typical of Western lifestyle, could lead to persistent endothelial dysfunction, and contribute to the development of vascular complications of diabetes.⁴

Understanding the impact of appropriate food choices, portion control, cooking methods, and cooking times on AGE production and consumption will facilitate further educational strategies to guide patients towards smarter food habits in order to delay the development of diabetes complications.

Brenda Cook

Diabetes Consultant, DCPNS

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“Upstream” Screening and Community Intervention for Prediabetes and Undiagnosed Type 2 Diabetes - Part 2

In the last DCPNS Newsletter, you learned how the Prediabetes Pilot Project evolved. The DCPNS partnered with Annapolis Valley Health (AVH), the Guysborough Antigonish Strait Health Authority (GASHA), the NS Department of Health, Dalhousie Family Medicine, Cardiovascular Health NS, and the NS Department of Health Promotion and Protection to assist with the validation of the *Canadian Diabetes Risk Assessment Questionnaire (CANRISK)* and to help guide the development and delivery of two community-based programs to promote lifestyle changes known to prevent or delay the onset of type 2 diabetes (DM). In this issue, we would like to share with you some of the results.

In total, 417 adults (40-74 yrs) living in AVH (n=186, Kentville & New Minas) or GASHA (n=231, Antigonish County) participated in the project. Two thirds of participants were female, and almost all were of white ancestry (97%); the average age was 57 years. Participants were highly educated, with nearly 40% holding a university degree. All participants had a family physician at the time of the study.

Case Ascertainment

Approximately 84% (n=350) of participants had normal blood glucose, 13% (n=54) had prediabetes (PreDM), and 3% (n=13) had

previously undiagnosed DM. These percentages differed from those observed for the first wave pilots in New Brunswick, Saskatchewan, and Prince Edward Island: 79%, 16%, and 5% respectively.¹ The percentage of PreDM cases detected also varied across the pilot communities: 10% in AVH versus 16% in GASHA.

In NS, the percentage of PreDM cases with isolated IFG (48%) and isolated IGT (41%) differed markedly from the first wave pilots at 26% and 59% respectively.¹ There was less of a difference for the percentage of PreDM cases with both IFG and IGT: 11% for NS vs. 15% for the first wave pilots.¹

PreDM Risk Profile

The 16-item *CANRISK Survey* was designed to assess an individual's 10-year risk for developing type 2 DM. Compared to participants with normal blood glucose, a higher percentage of participants with PreDM/DM reported having a BMI over 30, a waist circumference over 35 inches (women)/40 inches (men), a history of hypertension and high blood glucose, having one or more first degree relatives with DM, not engaging in at least 30 minutes of physical activity daily, not eating fruits and vegetables daily, and not holding a university degree. For women, a higher percentage of participants with PreDM/DM (vs those without) reported having gestational DM or giving birth to a baby over 9 pounds. When asked to rate their health, participants with PreDM/DM were less likely than their peers to report having excellent/very good health.

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Participant Feedback about Prediabetes Pilot Project

About 60% of participants (n=251) returned a brief feedback form evaluating various aspects of the Prediabetes Pilot Project. Respondents listed three major reasons for taking part in the study: 49% (n=123) wanted to be tested, 41% (n=103) wanted to help the study, and 41% (n=102) had a family history of DM. Nearly all respondents (n=246, 98%) reported that they were able to complete the *CANRISK* on their own, and all respondents agreed that the OGTT instructions were somewhat easy (1%), easy (14%), or very easy (85%) to understand.

The community awareness activities (e.g., newspaper articles, radio interviews, workplace ads, etc.) related to the project were fairly effective as 42% of respondents (n=106) indicated that they had heard about the project before receiving their study package. Only 53% of respondents (n=134) indicated that they knew what PreDM was prior to receiving the study package, highlighting the importance of public education about PreDM and its implications for long-term health.

Provider Feedback about Prediabetes Screening

In total, 25 family physicians (FPs) returned a physician feedback form (response rate=22%). About 40% (n=10) of responding FPs indicated that the *CANRISK* screening process had no impact on their work, 52% (n=13) noted that there was a minimal impact, and 8% (n=2) reported a moderate

impact. Responding FPs indicated that the *CANRISK* screening presented an opportunity to speak to their patients about positive lifestyle changes, identified previously undiagnosed cases of PreDM/DM, and resulted in more office visits.

Half of the responding FPs (n=13) indicated that the *CANRISK* should be used to screen for DM in their community, 28% (n=7) felt that the *CANRISK* should not be used for community screening, and 20% (n=5) were undecided. The most commonly cited reason for using the *CANRISK* as a population-based screening tool was to detect DM earlier, possibly altering long-term prognosis and changing outcomes.

Prediabetes Lifestyle Program

Each pilot community developed a Prediabetes Lifestyle Program that included five core components addressing lifestyle factors known to delay the development of type 2 diabetes among "at risk" individuals. An Introductory Education Session focused on risk factors for developing DM, criteria used to diagnose DM, prevention and treatment of DM, and healthy eating. This session was followed by Goal Setting, Nutrition, Physical Activity, and Stress Management sessions. These programs varied with regard to delivery location and session facilitators depending on the available community resources.

The 54 individuals identified as having PreDM were invited to take part in a community-based PreDM Lifestyle Program; 19 (35%) participated.

Conclusion

Overall, the Prediabetes Pilot Project was a very positive experience. The successful completion of this project would not have been possible without the many hours of dedicated work by the various volunteer committee members including the local and provincial advisory committee members, physician champions, lab directors, staff at the local research ethics offices, the local and provincial project managers, and the DCPNS Advisory Council.

There were a number of valuable lessons learned about various aspects of the *CANRISK* screening process and the delivery of the PreDM Lifestyle Program, including the importance of a committed project team and local project champions, the value of stringent OGTT protocol, the time required to build partnerships, the importance of flexible timing and delivery locations for Lifestyle Programs, and the need to plan for delays.

For more detailed information about the Prediabetes Pilot Project, see the Final Report to be posted on the DCPNS website (www.diabetescareprogram.ns.ca) in early fall.

Pam Talbot

DCPNS Project Manager

Reference:

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The Nova Scotia Renal Program is a Department of Health provincial program dedicated to improving the renal health and care for all Nova Scotians. The Program is responsible for standards development and monitoring, service delivery model recommendations, working with provider organizations and stakeholders to ensure uptake of standards, and participating in program evaluation. The Program's scope addresses the continuum of kidney disease and management from early identification of individuals at risk for kidney disease, through the various treatment options for management of end stage kidney disease including palliative care and is committed to the development of linkages and collaborative initiatives with partners to improve renal health and care for all Nova Scotians.

We are pleased to announce the launch of our new website. Please visit us at www.nsrp.gov.ns.ca.



Educator Sharing

Integration In Action - Interior Health, Penticton Integrated Health Centre, BC

Early in June, I had the opportunity to spend a day in the Penticton Integrated Health Centre. As integration is a key word these days, my time was split trying to understand the operational issues related to the planning and scheduling of an integrated program and the rest immersed in the overall philosophy and steps required to reach the present stage of operation. For those of you that may have attended CDA in 2007, this program was highlighted during a symposium; and my host was one of the keynote speakers - Susi Wilkinson, Manager.

In 2005, this program brought Healthy Heart, Predialysis, and Diabetes together under one roof in a community setting. Within sight of the acute care facility, this Center houses the specialty teams (primarily nurses and dietitians) from the above-mentioned areas. A pharmacist and exercise specialist support the predialysis and cardiac programs, respectively. A social worker is also available to predialysis clients and others as needed. Cross training and job shadowing has focused on increasing an understanding of each specialty area (allowing for vacation and other coverage), while recognizing that specialization is both necessary and valued. These teams access a centralized teaching room, registration, and office assistant support. Specialist physicians - nephrologists and cardiologists - attend clinics offered in this site on a regular basis; however, no physicians are housed in this area. The Centre is focused on supporting the general practitioner

and emphasis is placed on more group teaching and use of evidence-based self-management strategies, including action plans for those with chronic illnesses. A number of group sessions are offered that meet the needs of all conditions. These include, among others, "Getting Started Managing Your Health," "Healthy Eating and Active Living," "Chronic Conditions and Life Choices," "Weight Management," "Stress Management and Relaxation," etc. Specialty topic groups are also offered and include "Kidney Basics," "Diabetes Basics," "Staying Healthy with Diabetes," "Cardiac Basics," "Managing Heart Failure," "Overcoming Pain (for those with chronic pain)," "Insulin 'Starting' and Insulin 'Adjusting'," etc. Referrals are reviewed using a triage process (reviewed by one of the team members), and an individual appointment is given with a member of the most appropriate specialty team to review the services and options, and then the individual is encouraged to direct their own care. Group sessions are supplemented with individual appointments, where required. It is estimated that 2/3 of referrals will access the group programming and 1/3 continue with individual sessions. A database, including a scheduling component and clinical forms (general assessment, nutrition, etc.), is essential to the work of the Centre, with the eventual goal of becoming paperless and being able to run statistical reports on-site as required. While self-management support is a key philosophy of the Centre, direct link to the Stanford program, while desirable, has not yet been possible due to lack of ability to routinely facilitate the delivery of this program with trained lay-leaders.

Initially, six different committees were established; e.g., Service Delivery, Basic Education, Incorporating Self-Management Support, etc. And an informal patient advisory committee has helped to guide the work of the Centre and ensure client-centeredness. Individual physicians act as advisors to the three specialty areas and will meet with the applicable team on a routine basis; i.e., monthly. Flexible office hours allow for Saturday opening twice a month, and there are "problem-solve and drop in days (hours)" for those quick checks and review of action plans. Evening hours have not been found to be successful, but later afternoon hours meet the needs of the school age and working populations.

Future plans include established linkage with the EMR, paperless records, improved data capture and on-site reporting, and teams moving out to the community to assist physicians in their practice.

Peggy Dunbar

Provincial Program Manager, DCPNS



DCPNS Grant Funding (2008/09)

Project Summary

Eskasoni Diabetes Talking Circle Self-Management Program

Anita MacKinnon, Eskasoni Health Centre - (902) 379-3200

In an effort to help people take control of their health by taking a greater role in managing their diabetes, the Eskasoni Diabetic Clinic applied for and received a grant from the Diabetes Care Program of Nova Scotia (DCPNS). The goal was to develop a self-management program that would be delivered in a culturally appropriate manner. The program would be offered over a period of 8 weeks and highlight a different aspect of diabetes each week. It was hoped that by the end of the program, participants would learn self-management skills that would enable them to play an active role in their diabetes care.

The culturally appropriate component took the form of a “Talking Circle” (participants sit in chairs arranged in a circle), and an elder from the community began each session with a prayer. The program facilitator introduced the theme for the day as well as the guest speaker - an expert on the featured topic. Each guest speaker had experience with the community and diabetes, either through their personal or professional life. Featured speakers and topics for the eight week program included:

- Georgina Doucette - Elder
Mi'kmaq Spirituality
- John Ritter - Physician
What You Need to Know About Diabetes
- Angela MacDonald - Dietitian
Eating for Blood Sugar Control

- Mary MacIssac - Nurse
Managing your Diabetes
- Carol Roberts - Pharmacist
How to Take Your Medication
- Kay Batherson - Fitness
Controlling Your Blood Sugar with Exercise
- Sarah Mae Doucette - Champion
Living Well with Diabetes
- Closing - *Wrap up and Evaluation*

Within the “Talking Circle,” a “Talking Stick” was passed around for participants to hold as they told their stories and shared their experiences. While a person was speaking, the group honored them by listening and not interrupting. After all the participants had an opportunity to speak, the “Talking Stick” came to the guest presenter who addressed the issues that arose in the “Circle.” Discussion ensued; and after all issues and concerns were addressed, the “Talking Circle” closed with a prayer.

Themes that came up throughout the course of the program included fear, denial, lack of self-confidence, acceptance, and responsibility for their diabetes. Issues of low self-esteem, residential schools, culture and traditions, and prevention of diabetes were raised repeatedly.

A marketing strategy for this program began early in September and the “Talking Circle” began after Thanksgiving. In spite of this promotion, attendance was not large. Twenty-two

people took advantage of the program, with sessions ranging from 2 to 12 participants. At first glance, this was discouraging. However, upon reflection, the information that was generated would not have been possible had the groups been larger. In the security of the small group and with the “Talking Stick” in hand, participants revealed stories that were very private, at times poignant, and always inspirational. The quality of the information was exceptional.

Participants indicated in the program evaluation that they learned more about managing their diabetes and were not alone in their efforts. They enjoyed the sharing of experiences and recipes and the information and support provided by the guest speakers.

The presenters were all very impressed with the “Talking Circle” format and indicated that it brought out many issues that would not necessarily be covered in client visits.

Valuable insights were also realized by Debbie MacLean, a dietetic intern from St. Francis Xavier University, who was working on a community placement in Eskasoni at the time (see “Reflections of a Dietetic Intern” on page 13). As a future health care provider, Debbie hopes to incorporate some of the lessons learned in the “Talking Circle” in providing client care.

This diabetes self-management project utilized a “Talking Circle” format and has revealed itself as a valuable program for both the participants and health professionals who work in Aboriginal communities. Due to the success of the program, the Eskasoni Diabetic Clinic will continue hosting a “Talking Circle” on a monthly basis.

We are grateful for the support from the DCPNS, whose funding enabled this project to become a reality.

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Reflections of a Dietetic Intern

I learned so much attending these sessions. First, I learned how much work goes into organizing such a program – writing a proposal for funding, advertising, organizing guest speakers, shopping and preparing food, purchasing door prizes, setting up and cleaning up the facility, not to mention facilitating the talking circle itself. Each week we talked about something different such as taking medication properly, easy ways to add exercise to our lives, sharing recipes, and various ways to better take care of ourselves. Not only did I learn a lot about diabetes management, I now

understand the feelings of fear, denial, acceptance, and responsibility attached to this disease. Some of the sessions I found very personal, inspirational, and emotional.

In discussing and evaluating the program, I came to realize that although the attendance was not high, the quality of the discussions were exceptional. A comment by one of the invited healthcare professionals was something to the effect, “all healthcare providers need to hear what people with diabetes really have to say.” Diabetes is more than just managing medication, exercise, and carbohydrates. It is about managing

fear, lack of self-confidence, and denial; themes that kept coming up throughout the sessions. As a future health care provider, I hope to pay attention to what my clients have to say instead of focusing on what I have to say to them. The Diabetic Talking Circle was an informal environment in which all participants felt comfortable in sharing their story. I know that this program was a great learning experience for all those involved - the participants, the invited guests, the healthcare providers, and especially the intern.

Debbie MacLean, Dietetic Intern

Project Summary

Facilitated Diabetic Exercise and Education Program

Marilyn Campbell-Profitt, Soldiers Memorial Hospital DC

(902) 825-3411, Ext. 291

Anyone who works in diabetes education understands the importance of physical activity and exercise in the control of diabetes. We also know how difficult that is to achieve. Research confirms that less than 40% of people with diabetes are physically active. It also confirms that diabetes educators really haven't progressed in their efforts at increasing levels of physical activity.

The educators in our Diabetes Centre (DC) were more than eager to undertake a different approach with a greater prospect of success. Along comes the DCPNS Diabetes Physical Activity & Exercise Tool Kit, and we had just the approach we needed – one that assessed the personal readiness to exercise, used experts in physical fitness to guide the program, and the supportive context of a group. Physiotherapy and DC staff prepared a grant proposal to DCPNS and received funding.

The Participants:

DCPNS staff identified a cohort of 50 patients from the Registry based on their last reported level of physical activity. Fifteen were selected to participate. They were screened for cardiovascular risk factors and stress tested as indicated. They were also pre and post tested for their stage of change (i.e., physical activity), blood pressure, weight, waist circumference, A1C, and lipids. Most rated their “stage” as contemplative or later and as such were combined in the one program. Two patients with negative stress tests self-referred to Physiotherapy for assessment and guidance and then continued with the group.

The Program:

Physiotherapy staff developed the program content from the DCPNS Tool Kit. The program started with 3 weekly sessions and then bi-weekly over 5 months and was designed to help participants develop and safely progress their individual exercise plans. Resistance bands were introduced and practiced over the weeks. Other (active) people with diabetes and representatives from local fitness and recreation organizations came as guest speakers. A unique version of Jeopardy was used to review, and the Ms. Pudding program was used as the finale.

Outcomes:

Participants were very positive about the program, especially the role of Physiotherapy, the dietician, and the group format. Most advanced in their stage of physical activity to “Active” and “Maintenance.” There was an average loss of 4 pounds and 2.5 inches, but no consistent change in blood pressure, glycemia, or lipids. The latter issues may relate to the modest weight loss, winter weather (and Christmas), and the short duration of the program.

Physiotherapy and the DC staffs feel the program was worthwhile and hope to undertake a “second run” in the fall. This will include a similar sized group and an individual consult where indicated. We also want to rebalance the workload that fell most heavily on Physiotherapy staff.

DC staff offer their thanks to Physiotherapy staff for their cooperation and to DCPNS, District staff, and Soldiers Memorial Hospital for their support.

My Top 3 Misconceptions About the Process of Forms Revision

1. **This should not be a long process.** . . . If only that were true. The process of revising forms involves checking recent literature, communication with the current users, re-checking the wording and flow, proper formatting, and meeting with the DCPNS team. All of this takes time and patience.
2. **Once complete the forms will be half the length.** . . . I was positive that I would finish the process with a short, concise end product. Initial information gathered indicated that everyone was looking for SHORTER forms, but it seemed like people wanted to retain the current information gathered and sometimes more instead of less.
- 3 **I will update the forms and make everyone happy.** As most people know this is not possible. There were a few occasions when I was not sure which direction to go due to conflicting requests. Thanks to the electoral process, a few items were determined by majority rules.

The DCPNS forms are something we use in our everyday practice in the diabetes centres. They help us understand our patients and their goals. We rely on them to ensure consistency in what we do and guide us in the education and management of our patients. They are valuable tools for which I have a new respect. A very big thank you to all the educators who continue to assist in this project!

Cora Lee Joudrey, PDt CDE
Tri-Facilities - Capital Health

Physical Activity Corner

Our top news story for this issue of the newsletter is the recent release and distribution of the exercise video. This was much anticipated and has been very well received! The DCPNS and Acadia University partnered to produce a video (as a DVD) to accompany the *Physical Activity and Exercise Tool-kit* and its associated brochures. This video complements the “Resistance Program 2” brochure using resistance bands, and “Resistance Program 3” brochure using dumbbells. Intended for home use, the video provides “a how to” safely engage in resistance exercise with some well paced examples of how to get started and then to perform a number of the exercises outlined in the brochures.

Many exercise videos already exist, but this video is specific to diabetes educators and the work they do; and it will be very helpful to persons with diabetes. This video provides specific information on exercise guidelines for individuals with type 2 diabetes as well as two step-by-step programs that individuals can do at home. It provides *safe* guidelines, along with all the tools educators and their clients will need to appropriately do a strength training workout using proper techniques. It can be used to lead a group discussion or to reinforce individual practices in the home setting.

Remember that exercise *is* medicine – and this video will help provide the appropriate prescriptions.

If Nova Scotia educators did not receive a video, or have any questions, please contact the Research Coordinator, Arlene Perry, at arlene.perry@acadiau.ca or via phone at (902) 585-1618.

References continued from page 3 (State of the Art article).

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News From Around the Province



New Faces

Welcome to:

- **Lynette Doucette, RN.** Lynette joins the staffs of the Yarmouth Regional Health Centre and Digby General Hospital DCs.
- **Krystal Burns, PDt CDE.** Krystal returns to the Strait-Richmond Hospital after a 1-year maternity leave.
- **Lisa Brown, PDt.** Lisa joins the staff of the Roseway Hospital DC (Shelburne).
- **Candice Samson, PDt.** Candice joins the staff of the Aberdeen Hospital DC (New Glasgow).
- **Susan LeBlond-Turner, PDt.** Susan joins the staff of the Sutherland Harris Memorial Hospital DC (Pictou). Best wishes to Barb Campbell on her retirement.
- **Debbie MacLean.** Debbie joins the staff of Victoria County Memorial Hospital DC (Baddeck).

Please remember if you have a change in any staff (professional or clerical) to let the DCPNS office know ASAP to ensure our contact list remains current. Thanks!

Congratulations to:

- **Marsha Arnborg, PDt CDE,** Digby DC, on the successful completion of the CDE exam.

What's New at the CDA?

Diabetes Summer Surge

Help lead the surge to end diabetes. Join the nation-wide movement to raise \$1,000,000 in support of leading-edge research, education, and advocacy services for those living with diabetes. Friends, family, volunteers and health professionals are asked to join the fun by hosting a surge event or making a donation.

For more information, visit www.diabetessummersurge.ca or phone the Nova Scotia Region office at (902) 453-4232. Take action and sign up today.

News from the Company Representatives**

Greg Cromwell, Coloplast Canada, has good news to share with readers of the DCPNS newsletter. The Canadian Diabetes Association of Nova Scotia has recently

added select Coloplast skin care supplies to their Diabetes Supply Centre for retail sale. Newly added products include Gentle Rain Extra Mild sensitive skin cleanser; Sween 24 once-a-day moisturizer for normal to dry, flaky skin; and Atrac-Tain for extremely dry skin (e.g., cracked, fissured heels). Products are now available at both CDA Nova Scotia locations in Bayers Lake, Halifax and in Sydney, Cape Breton. Many local pharmacies, especially those with Home Health Care sections, also supply these products.

Greg can be reached at 1-877-820-7008, Ext 7369 (voice mail); 902-456-2471 (cell); <mailto:cagrc@coloplast.com>.

Steve Bell has recently joined **Wholesale Medical / Tremblay Harrison Inc.** as their Sales Specialist for the Oracle Blood Glucose Monitoring System. Simple and easy to use, Oracle is Canada's first talking blood glucose meter.

Steve can be reached at (902) 864-0094 or steve.bell@ns.sympatico.ca. Toll Free Customer Service: 1-866-829-7926 or www.oraclediabetes.com.

***This information has been brought to our attention to share with educators around the province. Endorsement is not implied by appearance in the newsletter.*

DIABETES
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OF NOVA SCOTIA

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