

Canadian Foundation for Dietetic Research Showcase of Dietetic Research in Canada – June 12-14, 2008

The Dietitians of Canada conference in Winnipeg provides an opportunity to showcase the broad range of dietetic research that is underway by dietetic students, practitioners and researchers. The focus on research supports members by providing researchers an opportunity to share and discuss results. The profession is also supported by strengthening the evidence base needed to continue the advancement of dietetic practice.

The abstracts reflect the unique body of knowledge of dietitians and their practice in many settings, such as communities, hospitals, schools, grocery stores, health centres and universities. A number of important research questions have been asked that increase our understanding of factors affecting food intake; methods to assess food intake and nutritional status; underlying biochemical mechanisms; and measuring the impact of dietetic practice.

A number of best practices are identified in health communication, education chronic disease management as well as hospital food and nutrition services. Questions related to emerging public health issues such as the environmental impact of food production, use of technology and food safety are also being investigated.

On behalf of the membership of Dietitians of Canada I would like to thank the Abstracts Review Committee who took time from their busy schedules to help appraise the abstracts and plan the program: Lucille Cenerini, Elizabeth Chagas, Kim Saltel, Miyoung Suh, Gina Sunderland and Ellen Vogel. I would also like to thank the Canadian Foundation for Dietetic Research in particular Isla Horvath and Diana Sheh for their support of practice based research in Canada.

Please join us in supporting our dietetic researchers by participating in the poster sessions on Thursday and Friday, June 12 and 13 and the oral abstract presentations on Saturday June 14.

Kristin Anderson
Abstract Review Committee Chair, 2008

**Canadian Foundation for Dietetic Research
Dietetic Research Event – JUNE 12- 14, 2008**

These abstracts represent research projects of dietitians that were accepted through a peer-review process for presentation.

*Indicates the presenter [R] = Research abstract [E] = Experience-sharing abstract

POSTER RESEARCH PRESENTATION ABSTRACTS –THURSDAY JUNE 12, 2008

Community-based Nutritional Care

Community consultation reveals support for a program of home-based nutrition services in British Columbia

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Purpose: The purpose of this project was to consult with representatives of health and human service organizations in British Columbia who had interest in home-based nutrition services to gather their insights about their clients' needs for, and their suggestions on advocating for these services.

Process: Representatives of 27 health and human services organizations (including health authorities, non-government organizations, provincial health services, and health professions' associations) were identified and provided with a copy of the report, "Toward a Program of Home-based Nutrition Services in British Columbia". Respondents were asked to comment on the report's relevance for their client group, to imagine how such a program could be constituted, and to provide suggestions about ways to move forward. **Project Summary:** Thirteen organizations provided feedback on the report through telephone, email, and in person consultations; four provided letters of support. Respondents wholeheartedly supported the concept of a province-wide, accessible, integrated, and coordinated program of home-based nutrition services. Some respondents furnished vignettes about clients who could benefit from such a program. Given the extent of need, recommendations included developing an integrated system of telephone-, community-, and home-based nutrition services available to all British Columbians in need, building on existing and emerging primary health, and telehealth services. **Recommendations &**

Conclusions: Engaging representatives of health and human service organizations raised awareness of the nutrition care gap in BC, and yielded support to proceed with advocacy for a province-wide program of home-based nutrition services. Findings from the consultative process were incorporated into the report to produce "The Need for Home-based Nutrition Services in BC", a report to support advocacy efforts at provincial, regional, and local levels throughout the province.

Evaluation of cooking circles in a prenatal program for low income women

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Objectives: This project evaluates the impact of cooking circles in a prenatal program for low income women. **Methods:** The prenatal program offers weekly support-education groups at seven different sites, and individual counseling with program staff. Free resources such as food, bus tickets, and childcare at group are available to enhance access and food security. Participants are involved in hands-on preparation of low-cost, healthy foods at the cooking circles, which are offered monthly at six of the weekly groups and co-facilitated by a kitchen coordinator and nutritionist. The cooking circle evaluation consisted of information collected from focus groups with program participants, interviews with front-line staff, and participants' self-reported behavior changes upon program completion. In 2007, six focus groups (33 participants total) and 11 staff telephone interviews were conducted. Three of the focus groups were conducted in languages other than English. **Results:** Key benefits identified by staff and participants were enhanced knowledge and skills related to healthy eating and food preparation, and decreased social isolation. Participants reported improved food choices for themselves and their families. Challenges faced by participants included their limited income, unfamiliarity with Canadian foods and lack of English. For the fiscal year 2006, 83% of participants who completed the program questionnaire after giving birth (356 of 429) reported eating better, with most improvement related to making healthier food choices (243 of 356), eating more regularly (178 of 356) and trying new foods (164 of 356). **Implications and Conclusions:** The results of this cooking circle evaluation were extremely positive, indicating cooking circles are a valuable component of a prenatal program for low income women.

School Nutrition

Effects of an exposure-based intervention on the acceptance of and willingness to try 'new' fruits by school-children in Newfoundland and Labrador

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Objectives: To increase elementary school-children's acceptance of and willingness to try three 'new' fruits introduced to their schools pre-existing breakfast program. **Methods:** Using a within-subjects design, 325 students from seven schools completed pre-tested questionnaires asking if they liked and were willing to try three 'new' fruits (kiwifruit, cantaloupe and green seedless grapes) [time 0]. The same questionnaires were repeated eight weeks later [time 1]. Students were then offered each fruit 1x/week for eight consecutive weeks as part of their schools breakfast program. At the end of this intervention, students completed the questionnaires again [time 2]. After a 10 week follow-up period, when these fruits were not offered, students completed the questionnaires a fourth time [time 3]. Principals of participating schools were asked, by a second questionnaire, to identify factors potentially associated with students' food choices at school. **Results:** From 1729 students, 571 (33%) returned signed parental/guardian consent forms. Over half (325/571, 57%) of these students completed all four questionnaires. Statistical analysis indicated no increase in acceptance or willingness to try either test fruit with time. No factors affecting student's food choices at school were identified. Findings suggest students' acceptance and willingness to try the test fruits remained positive throughout the control, intervention and follow-up periods. They also suggest a statistically insignificant increase in the percent of students who 'tried' the test fruits over the course of the study. **Implications & Conclusions:** Findings could help with developing interventions aimed at increasing fruit intake/acceptance by school-children and decreasing associated illness. A longer intervention period and alternate process for obtaining parental/guardian consent is recommended in future studies.

A search for a valid and reliable population-based tool for measuring fruit and vegetable consumption in children aged 4-9 years

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Objectives: To search for a reliable and valid population-based tool for measuring the effectiveness of fruit and vegetable intervention programs targeting young children, aged 4-9 years. **Methods:** This study employed a two-pronged approach, i.e. a comprehensive literature search and qualitative interviews with expert informants. The literature search was conducted by key word using five electronic databases, from 1988-2007. In-depth interviews were conducted with 9 informants using a semi-structured guide. The interviews were audio-taped, transcribed verbatim and analyzed sequentially, utilizing a combination of editing and immersion crystallization. **Results:** The comprehensive literature search captured 995 unique citations, of which 44 utilized methodologies to assess dietary intake in children aged 4-9 years. Valid and reliable 24-hour recall tools were identified for use in 7-9 year olds; however, there was a general consensus among informants that food frequency questionnaires were not suitable for use in children under 12 years of age. Informants acknowledged that 4-6 year old children are not cognitively capable of independently providing accurate dietary intake data. Direct observation was shown to be valid and reliable, but the validity of parental proxy was challenged, due to over-reporting, despite the recognition that it is necessary when utilizing intake tools in 4-6 year olds. **Implications and Conclusions:** Valid 24-hour recall tools are available for use in 7-9 year old children; but not for children under 7 years of age. Direct observation plus parental proxy may be an alternative for this younger age group, but cost would be considerable for population-based interventions.

Toward common measurement of eating behaviour in youth

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Purpose: To identify a set of common core indicators and measures of eating behaviour in youth to support broad application and comparisons across surveys, evaluations and research studies, especially those in the school setting. **Process or Content:** In December 2006, more than 40 experts from across Canada representing Education, Public Health, Government, Research and Surveillance from national, provincial and local perspectives, attended a 2-day workshop held at the University of Waterloo, to begin a consensus-building process of identifying core indicators and measures for healthy eating behaviour among school-aged children and adolescents. Following the workshop, participants were invited to add personal comments to summaries of small group discussion on individual- and environment-level indicators and measures. In the fall of 2007, 40 nutrition experts from across Canada were approached to review the individual-level core indicators and measures. Of those approached, n=23 (58%) responded with comments, from which a student-level sample questionnaire was developed. Five focus groups with n=30 nutrition and education experts were held in January/February 2008 with the purpose of coming to consensus on a reasonable prototype. The sample questionnaire will be revised, as per focus group recommendations, and pilot tested with students over the summer of 2008. **Project Summary:** A consensus-building process has been used to identify core indicators and measures of eating behaviour in youth. **Recommendations & Conclusions:** This project will lead to a set of indicators and measures with potential to be used for the common measurement of eating behaviours among students across Canada.

Nutrition for good health: an education initiative for adolescents

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Introduction: Two educational materials, Nutrition for Good Health CD and Booklet were developed based on the 2006 survey findings on nutrition knowledge, practices and iron status of 403 high school students in Antigua and Barbuda. These materials provided information on healthy eating, physical activity and healthy lifestyles. The CD contained two Power Point slides: “You and Iron: Just the Basics” and “Are You Healthy and Active?” The Booklet contained the print version of the slides, BMI calculator and weight graphs. The Booklet also included a 30-day “My Healthy Lifestyle Diary” for recording nutrition practices and physical activity. **Methods:** The Booklet was distributed to 787 students in three high schools. The CDs were provided to schools with computer facilities or distributed to libraries. After exposure to the slides, the students were instructed to fill the diaries for the next 30 days. The researchers collected the booklets, talked with the students about their learning and answered questions on nutrition and physical activity. **Results:** Students (26%) exposed to the Booklet and completed the diaries were more keenly interested in their food intakes, physical activity and healthy lifestyle compared to those who did not have access to the materials. A post-test questionnaire showed moderate increase in knowledge of iron-rich foods, iron-deficiency anemia and healthy weights. A qualitative review of the diaries showed that students were able to apply their knowledge to improve their daily food choices and increase their physical activity levels. **Conclusion:** The initial evaluation of the education materials indicated that students could improve their nutrition practices when provided information on physical activity, anemia and obesity prevention and control.

Nutrition and Health Education

Manitoba dietitians’ perspectives on counseling clients about pulses

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Purpose: Pulses (beans, chickpeas, lentils, peas) are highly nutritious but under-utilized by most Canadians. The purpose of this needs assessment was to learn more about dietitians’ experience and resource preferences in counseling clients regarding pulses. **Process:** Three focus groups with 17 dietitians were conducted in January and February, 2008 in Winnipeg, Manitoba. The majority of the participants worked in clinical, community or private practice. Field notes and transcripts of audio-taped sessions were analysed thematically to guide resource development. **Project Summary:** Dietitians said most clients lacked familiarity with pulses; even those who consumed them regularly seldom knew the health benefits. Dietitians were enthusiastic about encouraging their clients to eat pulses, without calling them “pulses.” They most commonly discussed pulses for “*general healthy eating*” and in counseling about cardiovascular health and diabetes. For this reason, they preferred a comprehensive educational approach addressing the multiple health concerns of clients. Qualities of pulses discussed with clients tended to be practical and basic (ease, availability, affordability, low-fat, high-protein, soluble fiber source, red lentils as an iron-rich first food for babies, dealing with flatulence). Typically, dietitians recommended eating familiar pulses in combination with other foods without indicating a specific frequency or amount to consume. Most common suggestions given for consumer resources and personal education included easy meal ideas and simple recipes with demonstration and tasting opportunities, visual means to assist with identifying various pulses, a comprehensive pamphlet and research updates in various formats. **Recommendations & Conclusions:** Dietitians perceive a need to educate consumers about pulses and indicated resources that would assist them. Participants viewed an evidence-based statement recommending specific amounts to consume as useful.

Clinical Research (including Outcomes of Intervention)

Pre-adolescent boys and girls have different body image and dieting concerns

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Objective: Weight, body image concerns and some experimental dieting have been reported in children as young as six-years-old; however there is little information comparing pre-adolescent boys' and girls' concerns. The aim of this investigation was to assess differences in body image and dieting in pre-adolescent boys and girls. **Methods:** In this cross-sectional descriptive study, figure drawings of children's body shapes; the Children's Eating Attitudes Test (chEAT), the Restraint scale, and selected questions from the Healthy Youth Survey were administered to children who were part of a representative sample of pre-adolescents participating in the Study of Asthma, Genes and Environment, Manitoba, Canada. Analysis was completed using Mann Whitney U tests, chi square tests and t-tests. **Results:** A total of 562 10- and 11-year-old children (319 boys; 243 girls) completed the questionnaires. Boys reported larger perceived body sizes ($p = 0.003$) and less satisfaction with height ($p=0.023$) and face ($p=0.016$) than girls. Girls desired greater changes in body size ($p = 0.02$), and their Restraint scale scores indicated a greater tendency to diet than boys (median: 4.8 vs. 4.7, $p=0.01$). Girls more often reported their friends had changed their diet in the last year to lose weight ($p = 0.001$). Girls reported having supper more often with their families ($p= 0.038$). There was no significant difference between boys' and girls chEAT scores. **Implications & Conclusions:** These preliminary results indicate key differences exist between 10- and 11-year-old boys and girls for body image and factors potentially relevant to future dieting habits. Understanding children's attitudes towards body image and dieting is important in developing interventions aimed at preventing childhood obesity.

Assessing stage of change (SOC) for readiness to engage in weight management behaviours in outpatients with osteoarthritis of the knee

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Weight loss improves symptoms of knee osteoarthritis (KOA). Assessing SOC provides a basis for devising targeted interventions for weight loss. Various algorithms are used to assess SOC for individuals to engage in weight management behaviors (WMB), but none were used in KOA. **Objectives:** (1) Assess SOC to engage in multiple WMB. (2) Determine whether a single-item (SI-SOC) or multi-item (MI-SOC) algorithm is more conservative. (3) Examine relationships between SOC and BMI, age, gender, and income. **Methods** Outpatients with diagnosed KOA and a BMI ≥ 25 kg/m² participated in this cross-sectional survey by completing validated SOC and demographic questionnaires. **Results;** Of 37 individuals (62% female), more were in the pre-action vs. action stages for portion control (81%) and usual activity (78%), while similar proportions existed for decreasing dietary fat (54%) and increasing F&V (45.9%). Moderate agreement (66%, $p < 0.001$) was found between MI-SOC and SI-SOC, with SI-SOC being more practical. Pre-action staging was significantly related to higher BMI ($p = 0.003$). Significantly more men were pre-action for portion control ($p = 0.031$) and increasing F&V ($p = 0.003$). More participants in the lowest and highest income ranges were pre-action for activity ($p = 0.006$). **Implications & Conclusions.** Stage of change was heterogeneous across weight management behaviors with ~ 80% of participants being classified as pre-action for portion control and usual activity. The SI-SOC algorithm is preferred over MI-SOC for staging patients with KOA. These results support creation of best practice weight management interventions using SOC for patients with KOA.

The role of total parenteral nutrition (TPN) in advanced cancer patients – a retrospective analysis

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Background: The palliative use of TPN in advanced cancer patients is controversial and rarely appropriate. There is, however, some evidence of improved quality of life and survival in certain patient groups. No process is in place to determine which Vancouver Cancer Centre (VCC) inpatients are suitable for TPN and which patients would benefit from continuation of TPN upon discharge. Clear decision-making guidelines and processes are needed to determine which patients would benefit from this supportive care modality. **Objectives:** To gain information on the use of TPN in the VCC hospital unit. **Method:** A chart review was conducted of inpatients receiving TPN at VCC from January 2004-June 2007. Patients were identified from the BCCA Information System, systemic therapy drug database, and the provincial cancer registry. Data collected included reasons for TPN use and discontinuation, nutritional parameters, and duration of TPN. Descriptive statistics were used. Ethical approval was obtained. **Results:** Sixty-one charts were reviewed. Mean age was 55.1 years with 55% being females and 52% having gastrointestinal cancer. The primary indications for use were to support patients with bowel obstruction and those with dysphagia where a feeding tube could not be placed. Mean number of days on TPN ranged from 1-122 and the main reason for stopping TPN was resumption of oral intake. Outcome data (i.e., weight changes and complications) were inconsistent. Overall survival was difficult to evaluate since many patients were living at time of study. **Implications:** Results will be useful in formulating decision-making guidelines however; more research is needed to measure the impact of TPN on nutrition-related outcomes, quality of life and survival.

Pressure ulcers – a chart review to explore current nutrition practices at the Grey Nuns Community Hospital

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Objectives: A descriptive-comparative study was designed to examine the profile of hospital inpatients diagnosed with one or more pressure ulcers, as well as the incidence of referral to clinical dietitians and the impact of their nutrition support practices. **Methods:** Seventy eight patient charts were identified as relevant for a retrospective chart audit. Select data from these charts were identified, entered into a spreadsheet, and examined using descriptive-comparative statistical procedures available through the SPSS computer program. **Results:** In 43 of the 78 cases (55%), a clinical dietitian was involved in patient assessment and treatment. Of the 43 patients, 12 were seen as a result of routine screening by a dietitian, and 13 were seen to initiate enteral tube feeding. The additional referrals were by physicians and nurses, although this occurred in only 18 of the 78 cases (23%), with 6 referred due to low food intake. Among all 78 patients, 26 (33%) had supplemental feeds ordered and only 19 (24%) had multivitamins ordered. Missing data like weights and BMI were common obscuring other possible outcomes. **Implications:** Preventing pressure ulcers is very important, as well as their rapid identification and management whenever they occur. In nearly half of those diagnosed with pressure ulcer, clinical dietitians are not involved in addressing the nutritional state of these compromised patients. With missing data, this study was not able to clearly outline the impact of involving dietitians in the care of complex compromised patients. Dietitians need to develop Nutritional Standards of Practice and they need to continue to conduct research that will illustrate their patient care outcomes.

Effects of omega-3 fatty acid on adiposity, hepatic steatosis, inflammation and immune function in an obese rat model

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Objective: To study the effects of dietary omega-3 fatty acid supplementation on adiposity, hepatic steatosis, blood lipids, markers of inflammation, and immune function in an obese rat model. **Methods:** Seventeen-week old male Zucker rats were randomly assigned to one of 4 groups: *fa/fa* (fa) baseline (faBASE), *fa* control (faCTL), lean (ln) control (lnCTL), or omega-3 fatty acid diet with alpha-linolenic acid (faALA). The study period was 8 weeks. Liver lipids were determined gravimetrically after Folch extraction. Commercial spectrophotometric kits were used to determine serum haptoglobin, triglyceride and cholesterol. Pro- and anti-inflammatory cytokine production from splenocytes was measured using a Lincoplex kit. Adipokine levels (e.g. leptin, adiponectin, tumor necrosis factor- α) in peri-renal adipose tissue were measured by Western blot analysis. **Results:** At the end of the study period, obese rats had greater body weight, more peri-renal, epididymal and visceral adipose tissue, and elevated liver lipids compared to their lean counterparts. Hypertriglyceridemia and hypercholesterolemia were also observed in the obese rats. None of these parameters were affected by the ALA diet. Serum haptoglobin concentrations were higher in the faALA group compared to the lnCTL but not faCTL. In general, neither cytokine production by splenocytes nor adipokine levels in adipose tissue were altered in obese rats receiving the ALA diet. **Implications & Conclusions:** Adiposity, hepatic steatosis, hypertriglyceridemia, hypercholesterolemia, inflammation, and immune function were unaffected by dietary ALA in a genetically obese rat model. While these results indicate an intervention with dietary ALA did not improve obesity, they do show that consumption of ALA has no negative or harmful effects on characteristics of the metabolic syndrome.

Dietetic Practice and Education

Evaluation of Dietitians of Canada's Practice-based Evidence in Nutrition (PEN)

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Objectives: The objective of this study was to develop an evaluation protocol for Practice-based Evidence in Nutrition (PEN), Dietitians of Canada's online evidence-based knowledge translation/transfer (KTT) service for dietetic practice. **Methods:** Using expert panels, one panel (n=14) validated a researcher developed questionnaire and guided the development of its online format and another panel (n=7) developed an interview guide using a three round modified Delphi process. **Results:** A 46 item web-based questionnaire to collect demographic and quality assurance data and a telephone interview guide containing open-ended questions focusing on respondents' understanding of evidence-based practice and PEN, the use of PEN by dietitians and other disciplines, the perception of the quality/usefulness of PEN and barriers and facilitators to PEN use were developed. **Implications & Conclusions:** A broad-based protocol validated by experts in the KTT and dietetics fields can be used to collect specific data and to assess PEN's impact on practice and its effectiveness as a KTT tool.

Food Service

Greening initiatives and recommendations for the Marketeria at St. Michael's Hospital

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Purpose: To make recommendations for expansion of the current recycling program and assess alternative options for disposables including: recyclables and composting. **Process:** A review of the current scientific literature and media information pertaining to hospital greening and the environmental impact of waste disposal and recycling was conducted. Personal and email contact was used to collect additional information on greening initiatives in comparable institutions. A cost analysis of the current disposables used and possible alternatives was conducted. **Project Summary:** The seven institutions that responded had a recycling program and many provided recycling stations in their cafeterias. Many had phased out the use of non-sustainable products such as polystyrene foam. Some offered a discount to staff and customers that bring their own mugs when purchasing tea or coffee. The potential to use compostable disposables was identified as an emerging area. Marek runs a cafeteria using bio-based products made from sugar, corn, and potatoes (Lorenzo Nocodemo, personal communication, June 29, 2007). A United States Department of Agriculture cafeteria has also piloted solely bio-based dishes and cutlery (Millner, 2006). The estimated additional annual cost of implementing the polystyrene recycling initiative is approximately \$45,500 for the daily pick-up of the polystyrene recycling only. The estimated additional annual cost of the compostables initiative is approximately \$58,000 for the cost of the compostable products, composting bins and compactor rental. **Recommendations and Conclusion:** Although both initiatives will have a positive impact on the environment, the compostables initiative is the more environmentally sustainable choice and could become more cost effective over time as product costs decrease.

Exploring the “Black Hole”. A comprehensive review of the paper menu return system at St. Michael’s Hospital

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Purpose: To determine factors that impact menu return rates at a tertiary care hospital using a paper menu selection system and to recommend changes to improve menu return rates. **Process:** A prospective menu return audit was conducted with inpatients who failed to return a completed menu to patient food services. **Project Summary:** During a 10-day study period, a total of 122 patients were identified as not having returned a menu. Sixty seven patients (55%), from 10 different hospital floors, were interviewed using the scripted menu return audit interview form. Fifty five patients were unavailable for interview due to: had been discharged (44%), sleeping (15%), in isolation (14%), at tests/procedures (5%) and room relocations (2%). Of the patients interviewed, 31% indicated that they had not returned a menu as they required assistance to fill it out and 19% did not realize that the menu needed to be filled out. Other reasons for menu return non-compliance included: absent reading/writing utensils, inability to read and forgetfulness. Overall, results suggest that 67% of non-returned menus could be avoided with clear instruction and personal assistance. Interviewed patients felt negatively towards a non-select menu system and television/telephone enabled systems, (80% and 78%, respectively). **Recommendations and Conclusions:** The ability to select menu items is important to patients. A system that supports patients with completing the task of marking menus and clearly informs patients of how to submit their choices could improve menu return rates and overall patient satisfaction.

The implementation of a spoken menu system at St. Michael’s hospital. A comprehensive review of potential benefits and logistical challenges

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Purpose: To collect preliminary data on the benefits associated with the implementation of a spoken menu system. **Process:** Satisfaction scores and menu return data were collected using standardized questionnaires both prior to and following implementation of the spoken menu. Spoken menu trials were conducted on four in-patient hospital wards reflecting a diverse patient population with varying lengths of stay. Questions were constructed to inquire specifically about the menu process, rather than satisfaction with food quality characteristics. **Project Summary:** Pre and post spoken menu implementation data were available from 24 patients. Menu returns increased on two wards (40 to 75% and 32 to 65%) but decreased on the other two (84 to 72% and 62 to 39%). Median satisfaction (IQR) scores were identical or increased in three wards but decreased in one (8 (8-9) to 4.5 (4-8.5), $p=0.12$). Overall, 3 of the four wards studied preferred the spoken menu system over the current paper menu system. The ward that preferred the current paper menu system was comprised of predominantly younger, more mobile patients who highly valued control over their diet selections. Older patients and those with functional impairments found the interpersonal aspect and assistance provided with the spoken menu to be important. **Recommendations and Conclusions:** The inconsistent impact of the spoken menu on menu return rates does not support the immediate implementation of spoken menu at St. Michael’s Hospital. However, it is clear that certain patient populations benefit from a spoken menu system, suggesting that the spoken menu may have beneficial effects in some but not all patient populations.

Are you ready to go green? St. Michael's Hospital Marketeria customers' attitudes towards greening

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Purpose: To determine the attitudes towards greening of the St. Michael's Hospital's Marketeria customers. **Process:** A 22 item multiple choice survey was used to determine customers' attitudes towards recycling. Demographic data were collected at the end of the survey. The survey underwent content validation prior to implementation and was subsequently revised. The survey was conducted both electronically and through the distribution of paper surveys. Data analysis suggested that the results collected electronically differed from those collected from paper surveys and therefore data were not pooled. **Project Summary:** A total of 315 surveys were collected (273 - electronic, 42 - paper). Respondents from the electronic survey were slightly younger than those who answered the paper survey. 28% of the respondents from the paper survey ranked current recycling methods in the Marketeria as poor while 33% from the electronic survey ranked them as good. Overall respondents were supportive of the implementation of different strategies to improve recycling methods. These included removing styrofoam water cups (paper=37.5%, on-line=29.4%), using paper plates (paper=66.7%, on-line=43%), bringing a refillable water container (paper=45.2%, on-line=32.6%), bringing own re-usable cutlery (paper=45.2%, on-line=34.8%) and new signage to improve recycling (paper=50%, on-line=44.2%). Although over 75% (paper=85.7%, on-line=74.8%) of the respondents stated that recycling is very important to them, none were willing to pay extra to support the use of recyclable containers or to cover the cost of recycling polystyrene containers. **Recommendation and Conclusion:** These results suggest that customers' attitudes towards recycling are positive; however they are reluctant to accept changes that result in increased cost. Therefore, creative strategies to implement recycling initiatives are required.

Process evaluation of the "What Could Be Sweeter?" component of the Eat Smart! Cafeteria Action Toolkit

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Objectives: This process evaluation was guided by three objectives: 1) To document the implementation of the "What Could be Sweeter" component of the Eat Smart! Cafeteria Action Toolkit, 2) To assess the effectiveness of the program, and 3) To explore the role of wellness committees in implementing the Toolkit. **Methods:** The following data were collected from 4 workplace cafeteria sites: 1) *Observations*; 2) *Patron Intercept Interviews*; 3) *Patron Surveys*; 4) *Cafeteria Operator Interviews*; and 5) *Wellness Committee Focus Groups*. **Results:** Most cafeteria patrons noticed the promotional materials (65% of interviewees and 76% of survey respondents). Although many recognized the Eat Smart! message (65% and 38%), few reported that the promotions actually influenced their purchasing (20% or 17-35%). Participants identified the following strengths of the Toolkit program: a) the variety of promotional materials and activities provided in the Toolkit, b) the professional appearance of materials, and c) the minimal impact of implementation on worksite staff. Participants thought that including a "wellness committee (or counterpart) the implementation of the Toolkit is beneficial. **Implications & Conclusions:** The Eat Smart! Toolkit was successfully implemented in the worksites due in part to the minimal impact on staff, and the support received by the Health Unit. Worksite staff thought the Toolkit was useful in promoting healthy food choices to cafeteria patrons; they thought it was a good program, and would it implement it again. While most participants did notice the Eat Smart promotional materials, most did not think they influenced their purchasing. Finally, the inclusion of wellness committee members is a valuable element in the successful implementation of the Toolkit.

Dietary Intake

Under-reporting of energy intake by BMI-classification among Nova Scotia youth

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Rising rates for overweight and obesity in Canada remain largely unchecked with the most severe increases apparent in children and youth. Nova Scotia has among the highest rates of “at risk of overweight” and “overweight” children and youth in Canada. Under-reporting of dietary intake (DI) has been well established in adult and youth populations and the inaccuracy of DI data limits investigations related to energy balance. **Objectives;** The objective of this study was to establish if DI reporting varies with body composition status among Nova Scotia students in grades 7 and 11. **Methods;** Using a web-based dietary intake assessment tool, reported energy intake (EI) was compared with estimated energy requirement (EER) for the study participants. The EER formula included objective accelerometer data on levels of physical activity (PA) and measured height and weight of the participants. The degree of reporting accuracy was categorized by calculated body mass index (BMI) for all participants. **Results;** Under-reporting was more severe among boys and girls in grades 7 and 11 in the “at risk of overweight” and “overweight” categories compared to the underweight and healthy weight participants. The group with the greatest level of under-reporting was the “overweight” grade 7 boys who underestimated their energy intake by a mean value of 1310 kcal. **Implications;** These results indicate reporting accuracy for DI varies in relation to overweight status and suggests additional rigour is required to collect accurate DI data from an overweight youth population. **Conclusions;** Existing tools for the collection of DI data from youth require refinement if accurate data is to be collected for large population studies.

Vulnerable Groups

Assessment of the nutritional adequacy of Ontario long-term care menus

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Objectives: To determine if the menu planning strategies used by long term care dietitians in Ontario are resulting in the provision of adequate nutrition to elderly residents and if increased food fortification or the use of special purpose foods to obtain a minimum of adequate nutrition would be indicated. **Methods:** A survey was distributed to 368 registered dietitians in Ontario belonging to the Dietitians of Canada Gerontology Network. Survey questions sought menu planning characteristics in terms of length of menu cycle, seasonal variability, inclusion of therapeutic menus and texture modifications, and quantitative data on macro- and micronutrients from a nutritional analysis. **Results:** The majority of planned menus followed a four-week menu cycle and included seasonal foods. Most facilities offer regular and diabetic menus, but less than half planned for other therapeutic menus and/or texture modifications. Less than half of the facilities obtain a quantitative nutritional analysis of their menus. On average, planned menus exceed macro- and micronutrient needs, but do not meet recommendations for fibre and vitamin D. **Implications & Conclusions:** Although planned long term care menus in Ontario appear to meet recommendations for most nutrients, elderly residents remain malnourished. A solution is still needed to reduce the incidence of malnutrition.

A comparison between traditional nutrition supplements and medication pass in long term care: a pilot study

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Objectives: The purpose of this study was two-fold: 1) to determine if residents in long term care will consume equal amounts of energy, protein, calcium, vitamin D, zinc, vitamin C, vitamin B-12, folate, and iron with medication pass (MedPass) compared to liquid supplements with meals and; 2) to determine if there was a difference in waste and cost between the two methods. The participants, food service and nursing staff were surveyed to determine their perceptions using both methods. **Methods:** The study was conducted on two wards in a long term care centre over 2-three day periods. During both phases, the amount of liquid supplement and the amount of food consumed by each participant was estimated. In Phase 2, a specific amount of liquid supplement (Resource 2.0 ® or Thick High Protein Drink (HPD)) was provided to residents with medications rather than with meals. **Results:** Eleven residents participated. Residents had a significant increased intake in Vitamin C during Phase 2 (P<0.05). During both phases, the mean dietary intake of vitamin D and folate was significantly lower while iron was significantly higher compared to the mean nutrient requirement (P<0.05). Surveys revealed the majority of nursing care staff did not feel participants consumed more nutrients in Phase 2. The use of Resource 2.0 ® resulted in lower waste but higher cost. **Implications & Conclusions:** Further research is needed in order to recommend MedPass. Providing more assistance with feeding would result in better nutrition for the residents.

Nutrition assessment of patients with inflammatory bowel disease

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Objectives: Malnutrition among inflammatory bowel disease (IBD) subjects is well documented in the literature and may arise from factors including inadequate dietary intake, malabsorption and disease activity. The aims of this study were to complete a comprehensive nutritional assessment of IBD subjects. **Methods:** 126 consecutive adults with IBD completed anthropometric measures, 4-day food record assessments and biochemical markers of nutrition. **Results:** IBD subjects generally present within an ideal body weight range with no differences by disease activity. A high prevalence of inadequate nutrient consumption was observed: vitamin E (63%), vitamin D (36%), vitamin A (26%), calcium (23%), folate (19%), iron (13%) and vitamin C (11%). Several biochemical deficiencies were also observed. The prevalence of subnormal serum levels was: hemoglobin (40%), ferritin (39.2%), vitamin B6 (29%), carotene (23.4%), vitamin B12 (18.4%), vitamin D (17.6%), albumin (17.6%), and zinc (15.2%). Dietary intake was not correlated with serum levels in all instances. **Implications & Conclusions:** Patients presenting to an outpatient clinic appear well nourished (anthropometrics) however micronutrient deficiencies do exist (diet and blood). Subjects with IBD have a high rate of iron deficiency and anemia which are most likely not secondary to diet. Supplementing with iron should be warranted only if a true iron deficiency exists. The routine evaluation of serum vitamin B6 and serum vitamin D levels is recommended. Routine multivitamin supplementation is warranted in IBD in view of numerous dietary and biochemical deficiencies observed among adult IBD subjects.

Vitamin fortification of pureed foods improves nutritional status of long-term care residents

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Objectives: Elderly people living in long-term care (LTC) are at risk for malnutrition and those who consume a pureed diet may be particularly at risk. The purpose of this study was to develop a fortification procedure at a LTC facility and to assess if nutrient intakes and serum vitamin levels subsequently increased. **Methods:** Four fortified pureed foods per day (meat and vegetables served at lunch and supper) were incorporated into the menu at a LTC facility. The foods were fortified onsite using a powdered vitamin mix containing the eight B vitamins, vitamin C, vitamin D, and vitamin E. At baseline and 8 weeks after the intervention, weighed food records for 10 residents were performed and serum vitamin B₁₂, folate, and 25-hydroxyvitamin D levels of 11 residents were analyzed. **Results:** Vitamin intakes increased after the intervention for all vitamins included in the fortification mix ($P < 0.01$). Notably, vitamin D increased from $2.1 \pm 2.2 \mu\text{g/d}$ to $12.2 \pm 3.3 \mu\text{g/d}$ and folate increased from $114 \pm 58 \mu\text{g DFE/d}$ to $505 \pm 86 \mu\text{g DFE/d}$. Mean serum 25(OH)D concentrations significantly increased from $41 \pm 21 \text{ nmol/L}$ at baseline to $66 \pm 11 \text{ nmol/L}$ after the intervention ($P < 0.01$). Mean serum folate levels increased from $10.7 \pm 4.9 \text{ nmol/L}$ to $25.2 \pm 6.4 \text{ nmol/L}$ ($P < 0.01$). Serum vitamin B₁₂ levels did not increase ($P > 0.05$) which may be because of the low prevalence of insufficient levels at baseline. **Implications & Conclusions:** This study has provided evidence that vitamin fortification of pureed foods for LTC residents is an effective method for improving nutritional status in a population at high risk for malnutrition.

Education and Training

The impact of diabetes education on nurses' knowledge and hypoglycemia care management of cardiovascular inpatients with co-morbid diabetes

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Diabetes education has forever been the cornerstone of diabetes management. A previous audit conducted at a tertiary care hospital reported inconsistencies in inpatient diabetes care, especially in hypoglycemia management. **Objectives:** 1) to assess the effect of a diabetes education session (DES) on cardiovascular nurses' diabetes knowledge and 2) describe hypoglycemia management of cardiovascular inpatients with co-morbid diabetes before and after DES. **Methods:** Registered nurses working within an inpatient cardiovascular program completed a modified Diabetes Basic Knowledge Test, before and after attending a sixty-minute DES. A retrospective chart review was conducted on cardiovascular inpatients (n=20) with diabetes, who were prescribed blood glucose lowering medications. **Results:** Overall test scores of nurses knowledge increased by $10.3 \pm 9.7\%$, $p < 0.001$ on post-test vs. pre-test. Test scores after DES significantly improved for hypoglycemia management ($11.1 \pm 16.1\%$, $p < 0.005$), dietary knowledge ($20.5 \pm 22.7\%$, $p = 0.001$), and general diabetes knowledge ($13.3 \pm 17.1\%$, $p < 0.005$). A total of 385 and 376 blood glucose tests were reviewed prior to and following DES, respectively. Prior to DES, 48 hypoglycemia episodes occurred, none of which were managed according to Canadian Diabetes Association (CDA) practice guidelines, whereas post DES, 10 hypoglycemia episodes occurred, 20% of which were managed according to CDA practice guidelines. **Implications and Conclusions:** DES appears effective at increasing nurses' knowledge of diabetes management. Poor hypoglycemia management persists despite possible improved diabetes care knowledge. Further study is needed to examine possible practical barriers that may exist in treating hypoglycemia within the inpatient hospital setting.

Toward evidence-based guidelines for nutrition education based on consumer needs and preferences: Results of a consumer survey

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Objectives: This is the third phase of a four-phase study designed to develop evidence-based, client-centred nutrition education guidelines based on the nutrition education needs and preferences of consumers. **Methods:** A national online survey of consumers' nutrition education needs (what they wanted to learn about) and preferences (how they wanted to learn) was conducted. The survey was informed by the findings of a national online survey of dietitians' perceptions of consumers' needs and preferences. **Results:** 680 consumers responded to the survey. Most were female, <50 years of age and had college/university education. About half reported having no medical conditions; only 20% reported symptoms that impacted their ability to eat or digest food. Cooking tips or recipes, and information on nutrition supplements were the top two nutrition education needs identified. Over half of the respondents (53%) wanted internet-based information. Significantly more respondents with medical conditions expressed the need for education related to foods to eat or not eat (55 vs. 44%; $p < 0.05$) and a preference for face-to-face consultations (40 vs. 26%; $p < 0.05$). Seniors were significantly less likely to want cooking tips/recipes (48 vs. 63%; $p < 0.05$) or internet-based information (18 vs. 57%; $p < 0.001$). **Implications & Conclusions:** The results of this survey suggest that most respondents were interested in nutrition education and had varied education needs and preferences. These findings inform the planning for national discussion groups with dietitians to develop nutrition education guidelines.

The development of a content-valid instrument to measure behaviours, attitudes and nutrition knowledge (BANKS) in Canadians

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Objectives: Nutrition knowledge translation is considered an integral step in shaping health attitudes and behaviours. However, access to psychometrically established instruments to measure the outcomes of teaching and learning interventions is limited (Wegener et al., 2007). The objective of this study was to validate the content of a survey tool designed to measure behaviours, attitudes and nutrition knowledge (BANKS) in the Canadian population. **Methods:** A modified Ebel procedure (Ebel & Frisbie, 1986, Butterwick et al. 2006, Lafave et al. 2007) was employed to establish content validity. In phase I the survey was subjected to simple (face) validation by local experts. In phase II the survey was reviewed by experts from across Canada. Experts judged the importance of each item through an assessment response checklist created to measure the underlying constructs established by the investigative team. Subsequently, the expert committee met face-to-face in an attempt to reach 80% consensus from items that did not achieve this benchmark in phase II. **Results:** In phase II, agreement among validators on survey items was low. Expert agreement improved substantially following the face-to-face committee validators meeting where 70% of items achieved consensus. A third phase was added to this process because additional concepts not included in the survey were identified as important by the national expert group (Lafave et al., 2007). This additional phase resulted in complete coverage of the underlying constructs with almost complete unanimity. **Implications & Conclusions:** Content validation was established for the Canadian BANKS. This is a key step in the development of a psychometrically sound survey tool. The next stage of tool development will include further construct validation and reliability testing.

Dietetic Practice and Education: New Perspectives

Experiences Using Simulations in Dietetic Education

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Purpose: The use of simulation-based learning within the health professions is increasingly more common. Within the context of dietetics, educational experiences which include simulations may facilitate the understanding of each other's practices and thought processes; may help enhance interpersonal communication skills; and may help with critical inquiry as it relates to the practice of dietetics.

Description of Content: Within courses focusing on communication and the nutritional management of disease, simulated learning experiences were designed and utilized to provide opportunities for internationally educated dietitians (IEDs), in Ryerson's Internationally Educated Dietitians Pre-registration Program (IDPP), to further enhance their professional skills. Candidates in the IDPP, as well as IDPP staff and instructors, share their insights and perspectives on their experiences of using simulations as learning tools. **Project Summary:** Simulations can open opportunities for critical dialogue on frameworks, norms, values and perspectives relevant to dietetic practice, as well as spark reflective inquiry. **Recommendations and Conclusions:** The experiences shared highlight the promise of simulation-based learning within dietetics education.

Dietitians and eating disorders: an international issue

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Objectives: The prevalence of eating disorders (ED) is higher in university nutrition faculties than in other college groups. However, little is known about what is being done to identify and support students with such concerns. The purpose of this study is to determine in an international sample of nutrition education faculties: 1.the extent of concern for eating disorders, 2.practices that currently exist for screening of eating disorders, and 3.current support for individuals identified with eating disorders.

Methods: Initial stage included development and trial of the questionnaire. Ethical approval was obtained by Capital Health Ethics (HREB). Contact information for distribution of the questionnaire was obtained in collaboration with Dietitians of Canada and International Congress of Dietetics. 664 questionnaires were distributed to university professors and educators electronically world-wide. **Results:** The completed study has 101 questionnaires returned from 36 countries, including Australia, Brazil, Canada, Denmark, India, Italy, Jamaica, South Africa, Turkey, UK, & USA. 76% felt ED are a concern among nutrition students. 57% thought that nutrition education programs should have policies/procedures in place to assist students and dietetic interns; however, only 15% had such. 47% thought it would be good to screen students for ED; however, 77% felt that there would be ethical issues in doing this. **Implications & Conclusions:** This study highlights that ED are a concern in nutrition faculties around the world; however, few programs have policies in place to address this problem, and it is not clear from responses how to tackle this problem. While screening for ED might be a desired option, ethical concerns first need to be addressed. More work needs to be done in this area.

Coming and going: exploring first- and fourth-year nutrition students' experience of their education

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Objectives: Little is known about nutrition students' expectations regarding their education, how their personal experiences and background shape these expectations, or how students become known as dietitians prepared for entry-level practice. This research explores the expectations students bring to their education and the influence of the educational process on the students. Exploring students' identity and the process of their becoming professionals (professionalization) provides insight into how nutrition knowledge is translated and adopted into professional practice. **Methods:** Student participants were either in their first (coming) or their final year (going) of a Nutrition undergraduate program. A trained Research Assistant facilitated the semi-structured interviews, which were then transcribed verbatim, coded according to emergent themes, and analysed using feminist discourse analysis. **Results:** Fourteen students participated; eight "coming" and six "going" (twelve females and two males). Only three participants did not have a previous post-secondary degree. There was diversity among students in age, ethnicity, and class background. All participants identified wanting to be dietitians. Our findings illuminate that, for some, professionalization necessitates a particular disembodiment, self-alienation, and loss of relationship with self. A student's professional identity intersects with and becomes bound to professional norms and discourses through their education. Students come with an awareness of such norms and discourses, which are amplified throughout their education, promising the fruits of professional credibility. **Implications:** Educators and preceptors may acknowledge the presence of an embodied, emotional curriculum as having an impact on learning and professionalization. More research is needed to verify the manner in which these phenomena influence practice. This research has implications for recruitment language, professional practice curricula, and ongoing support for graduating nutrition students as they enter practice.

Vulnerable Groups and Their Nutritional Needs

Nutritional profile and feeding challenges of Asian Indian pediatric patients with congenital heart disease

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Objectives; Pediatric patients with congenital heart disease (CHD) are often malnourished, especially those with cyanotic disease or pulmonary hypertension. This survey was carried out to study the characteristics of this population and their feeding habits and problems. **Methods;** A retrospective chart review of 639 patients with CHD (age 0 – 3 years) was conducted. Caregivers of 133 patients were also interviewed. **Results;** Malnutrition was widespread. About a third of the children were classified as 'failure-to-thrive' (FTT) (33.2%). Feeding problems such as breathlessness, interrupted feeds, vomiting and fatigue were prevalent (89%). Breastfed infants fared better than those on formula. Incorrect feeding practices included inadequate amount of food or formula, nutrient-poor foods, wrong foods for stage of development, misconceptions, wrong formula mixing and improper premature nutrition. Inappropriate foods were given (27.1%) but beneficial foods were withheld (15.8%). Feeding problems, co-morbidities, respiratory infections and developmental anomalies were highly associated with FTT ($p = <0.000$, <0.000 , <0.000 and <0.003 respectively). FTT was also related to PAH and younger age groups (4 – 18 months). After corrective surgery, lower weights were related to the number of ICU days (0.01%) and mortality (0.05%) and lower lengths with ICU days (0.05%). **Implications & Conclusions;** Better nutritional status of CHD patients prior to surgery leads to better prognosis. Patients vulnerable to developing FTT as identified in the above profile, should be targeted for prevention. Breastfeeding should be encouraged. Dietitian interaction with the caregivers, especially, those of Asian Indian pediatric patients with CHD, will help identify and address potential and existing nutritional concerns to optimize nutrition.

Barriers to Healthy Eating and Vitamin/Mineral Supplement Use Identified by Focus Group Participants in Saskatoon

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Objectives: The purpose of this study was to investigate barriers to healthy eating and vitamin/mineral supplement use among groups at risk for low nutrient intakes, particularly for individuals with low income. **Methods:** The study was completed in Saskatoon, Saskatchewan between September – November, 2007. Twelve focus groups were conducted with a total of 73 participants. Demographic information was assessed using a questionnaire. Focus group participants were recruited by a community liaison through community development organizations who worked primarily with people living in the core neighbourhoods. Participants represented a diverse population with regards to age, income, level of education, health status and cultural background. However, most were female (n = 63, 86%), and a large proportion (n=33, 45%) were receiving some or all of their income from social programs. Focus group meetings were audio taped; thematic coding was used to identify key concepts. **Results:** Five themes emerged regarding barriers to healthy eating: Knowledge, Income, Accessibility, Health, and Preferences. Participants indicated that barriers to healthy eating included a lack of readily available nutrition resources, the cost of healthy foods, limited time to prepare healthy foods, physical and mental health issues for themselves or their family, and the influence of others when purchasing food. Whether vitamin/mineral supplement use was considered, again participants' comments were clustered within the same five themes. If participants did want to take a supplement, barriers included not knowing which supplements to take, forgetting to take the supplements, cost, unpleasant side effects, and difficulty with swallowing the pills. **Implications & Conclusions:** The results of this study provide valuable information to focus our efforts in reducing the barriers to healthy eating and to appropriate vitamin/mineral supplement use.

Habitudes alimentaires et état nutritionnel des aînés francophones et anglophones à domicile au Nouveau-Brunswick

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Objectifs : Évaluer les habitudes alimentaires des aînés francophones et anglophones à domicile au N.-B et décrire leur état nutritionnel. **Méthodes :** Deux cent quatre vingt aînés francophones de plus de 65 ans ont été recrutés dans un milieu urbain et rural. Un groupe anglophone a été recruté pour des fins comparatives. Un relevé alimentaire de trois jours et un questionnaire de fréquence ont permis de déterminer les habitudes alimentaires. Le Mini Nutritional Assessment et des données alimentaires ont servi à l'évaluation de l'état nutritionnel. **Résultats :** L'âge moyen des sujets est de 70 ± 6 ans. Près de 60% des sujets ne rencontrent pas la recommandation pour les groupes lait/produits laitiers, légumes/fruits et produits céréaliers du Guide alimentaire Canadien et la consommation moyenne des quatre groupes d'aliments est inférieure à la recommandation. Les femmes consomment plus de légumes/fruits et de produits laitiers que les hommes. Ces derniers consomment plus que les femmes pour les produits céréaliers ($p < 0,000$) et les viandes ($p < 0,01$). Les apports moyens en vitamines C, B₁, B₂ et phosphore étaient adéquats et ceux en vitamine D, calcium et zinc étaient insuffisants. Les hommes ont des apports plus élevés en énergie, glucides et lipides que les femmes ($P < 0,05$). Ces dernières ont des apports plus élevés en zinc, vitamines C et A ($P < 0,05$). Selon le MNA, 15% des sujets étaient à risque nutritionnel. Cinquante quatre pourcent des hommes et 45% des femmes ont un poids santé. Les femmes présentent plus des problèmes de poids que les hommes. **Répercussions et conclusions :** Cette étude montre l'importance de promouvoir une alimentation équilibrée chez les aînés.

Health Communication

An evaluation of food safety information transfer to food handlers: One-page narrative infosheets

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Objectives: The objectives of this research were to develop and evaluate the efficacy of one-page post-able food safety information sheets to passively supplement training information for foodhandlers. The Infosheets were designed to create dialogue about food safety within the food-handling environment by linking specific global food safety issues with individuals' food handling practices. **Methods:** Food safety infosheets based on news media articles and supplemented with graphics and prescriptive messages were circulated weekly in retail and foodservice settings (n=11) and posted for employees to view. Topics included food handling practices, foodborne pathogens, microbial outbreaks and new research. A triangulation of research methods, including an expert Delphi group, food handler surveys (n=40), and in-depth interviews (n=18), was used to obtain quantitative and qualitative evidence. **Results:** The use of infosheets resulted in a positive change in individual employee's knowledge and intentions towards safe food handling and preparation. It was found through self-reporting that passively providing compelling reading material on food safety resulted in discussions around food safety between staff, and a greater retention of food handling information than active training had provided. It was found that the sheets with graphic displays of the effects of foodborne illness were more compelling than generic, less attention-grabbing prescriptive training methods. **Implications & Conclusions:** Ongoing training is an integral element of a complete food safety program for food handlers. Understanding target audiences communication preferences and providing relevant narrative supplements in messages can enhance risk management strategy effectiveness. Dietitians developing food behaviour programs and communications can be more effective by utilizing diverse media and including narrative examples to increase message relevance.

Healthy choices ur way: creating nutrition messaging with youth

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Purpose; Consultation with youth and increasing opportunity for youth participation is a priority of the Calgary Health Region. The purpose of this project was twofold; 1) to understand the factors that impact food decisions among youth and 2) to create youth orientated nutrition messages for use with vending machines. **Process;** Five focus groups with urban and rural junior high students (n = 120) and work with a communication firm was carried out to create the Healthy Choices UR Way nutrition concept. Focus groups (1 & 2) identified taste, convenience, food as a source of energy and looking good as the most relevant factors influencing vended food selection. The themes of "food for fuel" and "choice/empowerment" appealed to the majority of youth when compared to a "making healthy choices wherever you go" theme. Variations of the "food for fuel" and "choice/empowerment" themes were professionally produced and pilot tested with an additional three focus groups. **Project Summary;** The choice/empowerment theme appealed to the majority of youth. Variations of the choice/empowerment theme were created to depict three different healthy, tasty and convenient vended food choices. Posters, postcards and vending machine headers were created and the Healthy Choices UR Way concept was launched in two junior high schools. Informal evaluation of the Healthy Choices UR Way messaging materials indicates high acceptance and resonance with junior high youth. The applicability of the Healthy Choices UR Way concept in additional school food venues is being explored. **Recommendations & Conclusions:** Creating opportunities for youth involvement in nutrition projects increases the capacity of youth to take leadership roles in their nutritional landscape. Youth/ dietitian partnerships increase knowledge among all involved resulting in meaningful and high quality projects.

Risk reduction messages, the media and health authorities in a waterborne emergency

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Objective: To assess how well risk reduction messages of health authorities were reported in local newspapers during a boil water advisory event with high morbidity and mortality due to the presence of pathogenic microorganisms in the town water supply. The study was part of a larger qualitative investigation about risk communication and in-home food and water handling practices. **Methods:** A media analysis of risk reduction messages was carried out. The 125 media articles evaluated compared the practices (considered those actions suggested to residents) as recommended by health authorities and posted on their website, with practices included in published articles and the dates when the messages first appeared. Messages were those published in the closest daily newspaper (in a town about 60 kilometres away) between May 23 and June 6, 2000, and the weekly community newspaper printed in town between May 17 and June 14, 2000. Excluded from the analysis were any articles that did not recommend practices. **Results:** A total of 48 recommended practices were identified in published messages designed to reduce the risk of illness. One message to the public was changed 10 days into the emergency event. The corrected message was not picked up by the local daily paper; this information, about the concentration of bleach for instance, was published the following week in the weekly town paper. **Implications & Conclusions:** Authorities during an emergency cannot rely on the media to always pick up corrected messages. The need for getting information correct the first time is great, but so are the difficulties in getting the messages directed to the public right the first time.

Dietetic Practice and Education: use of technology and determinants of food choice

Could recommendations presented in Canada's new food guide affect the cost of eating?

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Objective: Eating Well with Canada's Food Guide (2007) incorporates several new dietary guidelines which could affect the affordability of a nutritious diet (e.g., eat two fish servings weekly). This study was conducted to determine whether following these new dietary guidelines could alter the cost of eating. **Methods:** Food cost data were obtained in 56 grocery stores throughout the city of Winnipeg. Health Canada's National Nutritious Food Basket (NNFB) was used to determine the cost of eating according to previous (1992) dietary guidelines; a modified NNFB (with five additional food items and adjusted weightings for items within particular food groups) was used to estimate the cost of consuming a diet incorporating the guidelines presented in Eating Well with Canada's Food Guide. Using food cost data obtained in 36 stores in which all NNFB items were available, weekly costs of eating according to previous and current guidelines was calculated and compared for a reference family of four, a single adult male and a single female parent with two children. **Results:** The weekly cost of eating following Canada's new food guide was slightly higher than that based on previous dietary guidelines for a family of four (\$154.36 versus \$150.76, difference of \$3.60), for a single adult male (\$54.95 versus \$52.99, difference of \$1.96) and for a single female parent with two children (\$111.99 versus \$109.91, difference of \$2.08), all $p < 0.001$. **Implications & Conclusions:** Following guidelines presented in Eating Well with Canada's Food Guide increases the cost of eating slightly. Changes in dietary guidance should consider the affordability of new dietary recommendations.

“What the world eats”: Increasing post-secondary students’ understanding of food security, the global environment and the role of policy advocacy

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Purpose: “Determinants of health” is the collective label given to the factors/conditions that research has shown will influence health status. The purpose of this pilot project is to engage nutrition students in a learning activity to increase understandings of food security at an individual/family level; examine critical questions related to food insecurity and the global environment; and gain first-hand experience with food costing, including the use of the “Nutritious Food Basket” (NFB) as a policy advocacy tool. **Summary:** This project involves students (n=130) students enrolled in a mandatory nutrition and lifecycle course. Specific tasks include completing an analysis of individual/family food security; viewing images on the “What the world eats” website and answering questions on food security in a global context; costing individual food expenditures for one week; and digitally photographing their families, together with foods/beverages consumed over a 7-day period. The caption for the photograph includes food costing information, a description of family members and their favourite foods. At the end of the term, students’ experiences will be evaluated using focus groups (8-10 students per interview) conducted by a trained facilitator. Findings will be used to improve the learning tool. A photo gallery of the digital photographs and accompanying captions will be featured on the faculty website. **Conclusions:** Preliminary findings suggest that the interactive, web-based and practical tool is well received by nutrition students and generally described as an “eye opening” experience. The tool provides instructors with an opportunity to explore the cultural diversity of the student population, while enhancing students’ knowledge and skills related to food security, global nutrition issues, and policy advocacy.

Validation of the EATracker Tool for the Assessment of Nutrient Intake in Adult Canadian Women: Preliminary Results

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Objectives: In view of the growing popularity of Dietitians of Canada’s web-based EATracker diet analysis program (www.EATracker.ca), the objective of the current study was to a) assess and compare nutrient intakes using EATracker versus dietary recall interviews for the same 24 hour period, and b) obtain participant feedback on the tool. **Methods:** a) Females (n = 60, age 19 – 50y) were recruited from those currently using EATracker. To date, 35 participants have completed EATracker’s 24h dietary assessment and subsequent one-on-one interviews by a trained dietitian using food models and multiple-pass techniques. Nutrient intakes were analyzed using Canadian Nutrient File data. b) Dietitians have obtained participant feedback and discussed discrepancies between EATracker and interview recalls. **Results:** Preliminary results (n=35), excluding supplements, indicate that dietary energy, macronutrients, mineral and most vitamin intakes were lower with EATracker but significantly correlated with dietitian-administered 24h recall data (p<0.001). Intraclass correlation coefficients for energy and macronutrients were >0.5, while mineral and vitamin intakes ranged from -0.082 (vitamin B6) to 0.69 (vitamin A). b) Users provided positive feedback on EATracker and appreciate access to this free tool from a credible source. Suggestions pointed to improving searches and portion estimation, and adding new and custom foods. **Implications & Conclusions:** Preliminary findings suggest that EATracker is well regarded by adult Canadian women and generally reflects nutrient data from 24h dietitian-administered recalls. Recommendations for revision from this evaluation will be provided to Dietitians of Canada to improve the design, validity and ‘usability’ of the tool. (Supported by Canadian Foundation for Dietetic Research)

Clinical Research

Milled flaxseed and flaxseed oil improve the n-3 fatty acid status of people with type 2 diabetes but have little impact on functional markers of the disease

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Objectives Examine the effects of dietary intake of milled flaxseed or flaxseed oil on plasma phospholipid fatty acid composition, glycemic control and cardiovascular risk factors in individuals with type 2 diabetes managed by lifestyle. **Methods** Subjects consumed a selection of bakery products containing no flax (CTL, n=9), milled flaxseed (FXS, n=13; 32 g/day) or flaxseed oil (FXO, n=12; 13 g/day) for 12 weeks. The FXS and FXO groups received equivalent amounts of alpha-linolenic acid (ALA; 7.4 g/day). Fasting plasma glucose, hemoglobin A1c, insulin, lipids, apoA, apoB, C-reactive protein, leptin, adiponectin, homocysteine, creatinine and phospholipid fatty acid composition were measured. Calculations for insulin sensitivity were also completed. **Results** There was a similar increase in plasma phospholipid n-3 fatty acids [ALA and eicosapentanoic acid (EPA), not docosapentanoic acid (DPA) or docosahexanoic acid (DHA)] with FXS and FXO consumption. Indices for glycemic control and cardiovascular risk factors did not change except the FXS group experienced a 1.2-fold increase in plasma homocysteine concentrations during the treatment period. The FXS and FXO groups had constant body weights during the study period, while the CTL group experienced a 4% gain, despite similar caloric intakes.

Implications & Conclusions Flax seed and oil intake appears safe but not beneficial to functional markers for type 2 diabetes and cardiovascular health. The exception was a moderate, negative effect of flaxseed on plasma homocysteine that warrants further investigation. Advantages of flax consumption for body weight control need to be investigated over a longer time frame.

Two male rock climbers and their bag of rice: a pilot study investigating energy restriction on oxidative stress

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Objectives: To investigate energy restriction and a high-intensity sport on oxidative stress. **Methods:** Two male outdoor rock climbers went on a 5-week climbing and camping trip, with a self-imposed diet (\$1/day/subject) of mainly rice, tuna, soup and bannock. One-week prior, baseline (B) diet records, anthropometrics, fat mass and blood samples were collected. Five-day diet and activity records, anthropometrics and fat mass were collected at the campsite at the end of each week (W1-W5). Blood samples were collected W2 and W5. RBC superoxide dismutase (SOD), glutathione peroxidase (GPx), plasma vitamin C and F2-isoprostanes were measured for antioxidant status and plasma CRP measured as a marker of inflammation. **Results:** Energy intake was 40% lower than needs, and intakes for carbohydrate, protein, vitamins A, C, D, E, B2 and Ca and Zn were poor. Both subject1 and subject2 lost 4.3% and 7.3% of total body weight and 14.9% and 17.4% of total fat mass, respectively, by W5. SOD and GPx activity increased from B to W2 then decreased from W2 to W5. Plasma vitamin C decreased to below normal range by W5. F2-isoprostanes, a marker of oxidative stress, showed a continuous increase from B to W5. Plasma CRP decreased by 97-99% from B to W2 and remained extremely low (<0.2 µg/ml) from W2 to W5. **Conclusions:** Prolonged inadequate total energy, macro- and micronutrient intake with outdoor rock climbing translated into loss of body weight and fat mass. Decreased antioxidant status and increased oxidative stress marker suggested higher risk of oxidative stress. It would be of interest to study if antioxidant supplementation alone or increasing energy intake reduces the oxidative stress.

Changes in taste sensitivity in patients undergoing coronary artery bypass graft surgery: a pilot study

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Objectives: To determine whether taste sensitivity for the four basic tastants: sweet, sour, salt and bitter are altered following coronary artery bypass graft (CABG) surgery and if so, to determine whether these changes persist up to four months post surgery. **Methods:** Taste detection and recognition thresholds for sweet (sucrose), salty (sodium chloride), sour (citric acid) and bitter (quinine hydrochloride) were determined using the multiple forced choice ascending concentration series method as described by the American Society for Testing at four points in time; baseline (pre-surgical), just prior to discharge, 5 weeks and 4 months post op. Demographic, medical, gastrointestinal and appetite data were obtained at the baseline visit. Mixed models analysis as well as generalized mixed model analysis was performed using the baseline scores as the reference. **Results:** 33 patients with a mean age of 61.8 ± 8 years participated in the study. Recognition and detection thresholds for sweet were significantly lower at discharge compared with baseline (1.7 ± 0.9 vs 2.43 ± 1.4 vs, $p < 0.05$, respectively). This difference remained significant at 4 months post op. In addition, detection and recognition thresholds for salt also declined with time with significant differences at 4 months post-op (2.26 ± 1.9 vs 1.81 ± 1.5 , $p < 0.001$ and 5.27 ± 1.3 vs 4.2 ± 2.2 , $p < 0.05$ respectively). The same trends were noted for the detection of sour and the recognition of bitter. **Implications & Conclusions:** Mean detection and recognition thresholds for each tastant decreased with time reflecting enhanced taste sensitivity. Future studies should examine the extent to which heightened taste sensitivity explains perceived taste changes reported by patients following CABG surgery.

Community-based nutrition programs

Development and validation of NutriSTEP™

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Objective: Health screening of young children is common practice and part of prevention and treatment. Nutrition screening is not routinely done partly due to the lack of a valid and reliable index. The objective of this project was to produce this index. **Methods:** NutriSTEP™ was developed in English and French with more than 1500 multiethnic preschoolers and their parents from across Canada over the past 10 years. Steps included: 1) Feasibility: a draft NutriSTEP™ with items developed from literature reviews, expert opinion and parent testing at school readiness fairs ($n=120$); 2) Further Item Identification: initial questions reworked in consultation with parents ($n=500$) and national, provincial and local nutrition professionals using an iterative process; 3) Refinement: index refined and assessed for content and cultural appropriateness, provincially and nationally ($n=670$); and, 4) Validation and Reliability: index validated and tested for reliability in Ontario ($n=450$). **Results:** A valid and reliable, bilingual, parent-administered nutrition screening questionnaire that is culturally sensitive and appropriate for multiethnic use across Canada. NutriSTEP™ takes less than five minutes to complete and includes 17 questions addressing food and nutrient intake, physical growth, developmental and physical capabilities, physical activity, food security and the feeding environment. **Implications & Conclusions:** NutriSTEP™ fills a current gap in the health screening of preschoolers; early findings suggest approximately 10% of preschoolers are identified as needing primary prevention, which includes a comprehensive nutritional assessment and treatment. NutriSTEP™ is a fast, simple way to assess eating habits, identify nutrition problems and ethical screening programs can direct parents of preschoolers at risk to appropriate community resources. Furthermore, NutriSTEP™ can be used for surveillance, and for evaluating nutrition intervention programs.

Targeted Implementation of NutriSTEP™

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Objective: NutriSTEP™ is a valid and reliable nutrition risk screening index for preschoolers that has gained widespread interest. Prior to extensive dissemination and adoption, potential implementation models need to be investigated. The development of two models in Ontario and the challenges and opportunities with implementation will be presented. **Methods:** A self-referral model based on mailed screening of kindergarten registrants was implemented in southern Ontario. An assisted referral model was implemented in two northern Ontario communities at screening fairs and Best Start Hubs. Site coordinators tracked the developmental steps of the screening program in their communities (e.g. advertising, liaising with key stakeholders, development of referral plans and protocols, training of screen administrators, and buy-in of partners) and challenges to implementation. **Results:** Challenges in development and implementation included training of facilitators for administration of NutriSTEP™, the need for the availability of NutriSTEP™ in languages other than English and French, issues related to privacy of personal information for the self-referral model and a mail-out by a school board or other agency. Clear communication and buy-in is essential from various stakeholders. The assisted referral model was easier to develop and implement than the self-referral model. **Implications & Conclusions:** Screening programs require significant development and implementation inputs to be successful. The two models tested were considered feasible at the outset and referral models identified an ethical process, although the assisted screening model was easier to implement, especially when screening vehicles such as fairs are already in place. A variety of educational and process materials (e.g. a toolkit) are necessary to facilitate successful community-level implementation. Funding sources: The Nutrition Resource Centre and the Danone Institute of Canada.

Supporting the implementation of school food and beverage guidelines in British Columbia

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Purpose: The purpose of this project is to support a happier and faster implementation of the provincial government's *Guidelines for Food and Beverage Sales in BC Schools*. **Process:** A needs assessment was conducted and implementation plan developed in consultation with the education community, regional health authorities, Ministry of Education and Ministry of Health. The two year implementation plan was initiated in June 2007. **Project Summary:** The consultation process resulted in the development of: expanded Dial-a-Dietitian call centre service to answer schools' questions about implementing the Guidelines; Brand Name Food List website tool that provides ratings for packaged and franchised food and beverages based on the Guidelines categories; customized school district support that includes fact sheets, school district coordinator identification, training and support; school community awareness with presentations, exhibits and articles in relevant publications; and vendor support and training. **Conclusions:** This project is facilitating partnerships with education and health stakeholders to enhance existing services, to develop tools to meet the needs of schools and school districts, and to share best practices on the implementation of healthier food and beverages sales in schools. Leveraging existing programs and integrating efforts has resulted in the development of several supports within a short time frame.

Wellness and public health: chronic disease

Incident type 2 diabetes in Aboriginal Canadians and associated risk factors: the metabolic syndrome (MetS) and lifestyle behaviors

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Objectives: To determine incident type 2 diabetes and associated risk factors in an Aboriginal Canadian population. **Methods:** Of 606 Sandy Lake Health and Diabetes Project participants who were free of diabetes at baseline, 540 (89.1%) participated in 10-year follow-up assessments. At baseline, anthropometry and interviewer-administered questionnaires including a 24-h dietary recall were obtained. Fasting and 2-h postload glucose were measured at baseline and follow-up to determine incident type 2 diabetes. **Results:** The incidence of type 2 diabetes was 17.5%. High baseline body mass index, percent body fat, waist circumference, waist-to-height ratio, serum glucose, insulin, triglyceride; and hypertension were associated with increased type 2 diabetes risk with adjustment for age, sex, and MetS (all $p \leq 0.03$). The NCEP and IDF defined MetS at baseline predicted incident type 2 diabetes (odds ratio [OR] 2.03 [95% CI 1.10-3.75] and 2.14 [1.29-3.55], respectively). Diet, physical fitness or smoking history in combination with MetS at baseline altered type 2 diabetes risk ($p < 0.05$). **Implications & Conclusion:** Unhealthy lifestyle behavior in combination with MetS at baseline increased risk of developing type 2 diabetes. Identifying individuals with MetS and treating the syndrome with lifestyle intervention may be a practical route to prevent further progression of metabolic abnormalities in Aboriginal communities.

Identifying women with low bone mass: A systematic review of screening tools

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Purpose: Measurement of bone mineral density (BMD) using dual energy x-ray absorptiometry (DXA) is the method of choice for detecting low bone mass and increased risk of osteoporotic fracture; however, DXA is expensive and not widely available. Several screening tools have been developed to identify women with increased risk, who would most benefit from DXA screening, based on an evaluation of risk factors associated with osteoporosis. This study assessed the effectiveness of osteoporosis risk factor screening tools in determining postmenopausal women at risk of developing osteoporosis and related fracture. **Process or Content:** Appropriate databases and sources of primary studies were identified. A systematic review of the literature using a comprehensive search strategy was employed and all citations were stored. Exclusion criteria were established, final selected articles were coded, and critical quality assessment was conducted. Study characteristics were tabulated and comparisons were made followed by discussion of limitations and conclusions of the review. **Project Summary:** The systematic review revealed 10 different screening tools of which five were included after quality assessment.

Recommendation and Conclusions: The risk factor screening tools reviewed are useful in identifying postmenopausal Caucasian women in need of DXA screening and possible intervention for osteoporosis. Performance was relatively consistent for all screening tools regardless of the number of risk factors used, but for health care providers and researchers, the Osteoporosis Self-Assessment Tool (OST) is the simplest approach to determine individuals at risk of osteoporosis and in need of DXA screening. There is still a need for further validation of screening instruments in both men and ethnicities other than Caucasian. Experiences with the systematic review process as well as the use of screening tools will be highlighted.

An interdisciplinary team approach to cardiovascular risk management: the ANCHOR project: the ANCHOR project

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Purpose: The ANCHOR Project examines a process of integrating an interdisciplinary team into a primary care practice with the goal of reducing cardiovascular risk. **Description:** Members of the interdisciplinary team include a nurse, two dietitians, a pharmacist, physiotherapist and social worker. The dietitians and nurse perform health risk assessments which include a evaluation of eating habits (measured by a healthy eating index), smoking, social supports, exercise habits, plus a variety of screening tests such as waist circumference, blood pressure, fasting glucose and lipids. Risk score is based on Framingham risk equations and the National Cholesterol Education Program guidelines. Behaviour change is assessed and counseling is conducted in accordance with the Stages of Changes Model. ANCHOR teams are coached monthly by a psychologist who specializes in behavioral modification. Qualitative and quantitative data such as clinical parameters, referrals to health services, behaviour change data and drug utilization are linked using two data bases. **Project Summary:** 64% of ANCHOR participants have shown improvement in overall healthy eating scores at the end of 12 months and significant cardiovascular risk reduction. **Conclusion:** Focus group interviews and patient satisfaction questionnaires indicate overall patient satisfaction and positive team experiences. In particular, clear and quantifiable project objectives and outcome measures influenced both staff and participant satisfaction. The results of ANCHOR project have far reaching implications for future primary prevention and chronic disease management processes.

MORGAN MEDAL AWARD RECIPIENT ABSTRACT

Brendine Partyka was awarded the Morgan Medal by the Canadian Foundation for Dietetic Research. This award is presented to a dietetic intern or student who demonstrates excellence in a practice-based research project

Exploring Infant Nutrition and Moving toward Solutions

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Introduction: In April, 2006, the Government of Saskatchewan contracted CHEP Good Food Inc. to explore and make recommendations regarding infant food security in Saskatoon. I assumed the role of lead researcher and gained experience in leading all aspects of the research process. The experience with CHEP was warm with values of community, empowerment and partnership. Today, the research recommendations are being further explored as CHEP and community partners collaborate to build a stronger community that supports healthy babies and healthy families.

Objectives: This study addresses infant nutrition and food security in Saskatoon. Specific objectives of the study are to (a) assess the current situation regarding access to all forms of infant nourishment; (b) understand if any challenges regarding access to infant nutrition exist; (c) determine the current use and effectiveness of programs and services related to infant nutrition; and (d) identify what can be done to improve food security for all infants in Saskatoon.

Methods: Semi-structured focus groups (n=9) and interviews (n=9) were facilitated with parents and community stakeholders. Participants were asked to respond to open-ended questions that explored how infants in Saskatoon were nourished, if any challenges regarding access or provision of adequate nutrition existed, and how the community could support the healthy growth and development of infants. Focus group and interview transcripts were analyzed using thematic analysis and emerging themes were categorized.

Results: This study confirms that infant food security is a concern in Saskatoon. Key barriers that limit a family's ability to breastfeed or attain other forms of infant nourishment include knowledge of feeding practices, lack of breastfeeding support, access and affordability of infant formula, transportation and poverty. Infant nutrition and food security can be improved by expanding educational and programming opportunities to families, increasing breastfeeding support and identifying acceptable means to provide emergency formula. Successfully addressing infant food security must also include discussion and movement in social policy and family food security contexts.

Implications and Conclusion: Communities must support dignified access to resources and address the root causes of food insecurity. All forms of infant nourishment, including breastfeeding, formula feeding and solid foods must be respected in addressing food security in the family and community context. In doing so, all community members will be supported in lifelong health and development.