

COLLABORATION FOR OUTCOMES
RESEARCH AND EVALUATION

ANNUAL
REPORT

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UNIVERSITY OF BRITISH COLUMBIA

Faculty of Pharmaceutical Sciences
University of British Columbia
2146 East Mall
Vancouver BC
V6T 1Z3
Tel: 604.822.9460
Fax: 604.822.5964
<http://www.core.ubc.ca>

A WORD FROM CORE'S DIRECTOR

We are very pleased to issue the second Annual Report for the Collaboration for Outcomes Research and Evaluation (CORE) located within the Faculty of Pharmaceutical Sciences at the University of British Columbia. This report highlights the research conducted by personnel from CORE focusing on specific accomplishments by many of our outstanding students and staff.

CORE continued to develop at a rapid rate this past year. Collectively, members of CORE's Faculty were either principal investigators or co-principal investigators on four newly awarded Canadian Institutes for Health Research (CIHR) Operating Grants and two CIHR funded New Emerging Team Grants. We have also embarked on research in some new exciting areas including the determination of societal preferences for food labeling of allergen containing foods (funded by the National Centre of Excellence – AllerGen), and whether innovative prescription labels improve HIV patients' knowledge of their drug therapies. Our work continues to be published in highly ranked, peer-reviewed journals and presented at both national and international forums, while our knowledge translation and dissemination strategies with stakeholders and decision-makers continue to be a central part of our research as we strive to keep our results relevant to policy making.

CORE also continues to meet its education mandate. At the undergraduate pharmacy level, the elective course in Health Technology Assessment and Pharmacoeconomics that Dr. Lynd and I developed continues to be highly ranked by students. In addition, we, along with Drs. Marc Levine, Mary Ensom and Fawziah Marra, developed a mandatory course for Doctor of Pharmacy students in literature interpretation and applied methods that was formally approved by Senate and will initially be offered in September 2009. With respect to continuing professional education activities, we ran two very successful workshops – a two-day introductory workshop on Health Technology Assessment at the UBC Golf Club, and another workshop regarding the assessment of societal preferences (funded by AllerGen).

Although we were sorry to see Ms. Jocelyn Wentland and Ms. Kathryn Richardson leave CORE to pursue new opportunities in different cities this past year, we have continued to attract highly qualified personnel and were pleased to have Ms. Stephanie Harvard and Ms. Maja Grubisic join our group in 2008. Other 2008 highlights include the seconding of Dr. Judith Soon by Health Canada to do important preparatory work for the Drug Safety and Effectiveness Network. Our complement of students and trainees continues to grow with the additions of Myra Wang (M.Sc. student), Belinda Wong (M.Sc. student), and Mohsen Sadatsafavi (Ph.D. student). Mehdi Najafzadeh (2nd Year Ph.D. candidate), Na Guo (3rd year Ph.D. student), Jennifer Faddegon (3rd year Ph.D. candidate) and John Woolcott (4th year Ph.D. candidate) continue to excel in their programs and have made significant strides with their projects.

With another hugely successful year behind us, we are looking forward to working on the innovative and exciting projects that 2009/2010 will bring.

Respectfully submitted,



Carlo Marra, Pharm.D., Ph.D., FCSHP
Associate Professor and Director,
Collaboration for Outcomes Research and Evaluation
Canada Research Chair in Pharmaceutical Outcomes
Michael Smith Foundation for Health Research Scholar
Faculty of Pharmaceutical Sciences,
University of British Columbia

MEMBERS OF CORE

Leadership

Carlo A. Marra, BSc (Pharm), PharmD, PhD, FCSHP
Director, CORE; Associate Professor, Faculty of Pharmaceutical Sciences, University of British Columbia.

Larry D. Lynd, BSP, PhD
Associate Director, CORE; Assistant Professor, Faculty of Pharmaceutical Sciences, University of British Columbia.

Faculty

David W. Fielding, BSc (Pharm), MSc, EdD
Professor, Associate Dean of Academic Affairs & Acting Chair, Division of Pharmacy Practice, Faculty of Pharmaceutical Sciences, University of British Columbia.

Fawziah Marra, BSc (Pharm), PharmD, FCSHP
Associate Professor, Faculty of Pharmaceutical Sciences, University of British Columbia; Clinical and Academic Director, Vaccine and Pharmacy Services, BCCDC.

James McCormack, BSc, BSc (Pharm), PharmD
Professor and Chair, Division of Clinical Pharmacy, Faculty of Pharmaceutical Sciences, University of British Columbia.

Judith A. Soon, BSc (Pharm), RPh, MSc, Dipl (Epidemol & Biostat), PhD, FCSHP
Assistant Professor, Faculty of Pharmaceutical Sciences, University of British Columbia; Director, Community Pharmacy Research Network.

Marc Levine, BSc, BSc (Pharm), PhD
Professor, Faculty of Pharmaceutical Sciences, University of British Columbia.

Mary Ensom, BS (Pharm), PharmD, FASHP, FCCP, FCSHP, FCAHS
Professor and Director of the Doctor of Pharmacy Program, Faculty of Pharmaceutical Sciences, University of British Columbia.

MEMBERS OF CORE

Associates

Aslam Anis, PhD

Director, Centre for Health Evaluation and Outcome Sciences; Director, Masters of Health Administration Program (MHA) and Professor of Health Economics, Department of Health Care and Epidemiology, University of British Columbia.

J. Mark Fitzgerald, MB, MD, FRCP(I), FRCP(C), FACC

Scientist, Centre for Clinical Epidemiology and Evaluation, Vancouver Coastal Health Research Institute; Professor, Faculty of Medicine, University of British Columbia; Head, UBC Respiratory Medicine Division, Director Centre for Lung Health.

Janusz Kaczorowski, BA, MA, PhD

Professor, Department of Family Practice, University of British Columbia; Director of Primary Care and Community Research, Child & Family Research Institute.

Jeff Johnson, PhD

Professor, Department of Public Health Sciences, Faculty of Medicine and Dentistry, University of Alberta; Chair, ACHORD (Alliance for Canadian Health Outcomes Research in Diabetes).

John Esdaile, MD, MPH, FRCPC

Scientific Director, Arthritis Research Centre of Canada; Professor, Division of Rheumatology, Department of Medicine, University of British Columbia.

Karim Khan, MD, PhD, FACSP

Professor, Department of Family Practice, University of British Columbia.

Ross Tsuyuki, MSc, PharmD, FCSHP

Director, EPICORE (Epidemiology Coordinating and Research Centre); Professor of Medicine, Division of Cardiology, University of Alberta.

Steve Morgan, BA(Hons), MA, PhD

Associate Professor, Department of Health Care and Epidemiology, University of British Columbia.

Staff

Jiamei Liu, BA, MA, MM, Mathematical Modeler

Kristin Westland, BA, Administrative Manager

Lindsey Colley, BSc, MSc, Statistician

Louise Gastonguay, RN, BSc, MSA, Clinical Research Manager

Maja Grubisic, BSc, MSc, AStat, Statistician

Nancy Makela, BScN, RN, Research Nurse

Salma Lalji, Research Data Technician

Stephanie Harvard, BAH, MSc, Research Associate



ABOUT US

Objectives

The University of British Columbia's Collaboration for Outcomes Research and Evaluation (CORE) group addresses the need for clinical and economic research and education in pharmaceutical outcomes assessment. The CORE team is a multidisciplinary group of researchers with expertise in clinical pharmacy, pharmacoepidemiology, health economics, health services research, program evaluation and health promotion research.

CORE strives to provide evidence which will maximize the clinical, quality of life, and economic benefits of drug therapy, while minimizing associated risks. This is achieved through independent research and research collaborations with pharmaceutical and health outcomes researchers throughout North America and Europe.

Mission

CORE's mission is to improve health-care related outcomes for drug therapy through the application of the best in research, education and practice enhancement strategies.



Vancouver, BC





RESEARCH THEME AREAS

Pharmacy Practice

COMMUNITY PHARMACIST RESEARCH NETWORK

CORE has established the Community Pharmacist Research Network (CPRN) to capitalize on the availability and accessibility of pharmacists in urban and rural communities throughout the province. The CPRN enables the collection of real-time, patient-specific data under conditions of routine clinical care, and can be utilized in settings of randomized clinical trials as well as prospective and longitudinal studies. Post-marketing data on tolerability, adherence and effectiveness of medications can be efficiently obtained and the field study data linked to medical office records and the BC Linked Health Databases. With funding from peer-reviewed sources, the CPRN has been utilized in the past year for multi-university, multidisciplinary studies of chronic diseases such as osteoarthritis, diabetes and asthma. These collaborative projects often involve health policy decision-makers, academics and advocacy groups, as well as community health care professionals. Some of these studies are described below.

PHARMACIST-INITIATED INTERVENTION TRIAL IN OSTEOARTHRITIS (PHIT-OA)

We have completed a preparatory study titled Pharmacist Identification of New, Diagnostically-confirmed OsteoArthritis (We have completed a preparatory study titled Pharmacist Identification of New, Diagnostically-confirmed OsteoArthritis (PhIND-OA)). The objective of this study was to determine whether pharmacists could identify individuals with previously undiagnosed knee OA by using a simple screening questionnaire. Of the 411 subjects screened by the community pharmacists, 274 were deemed to be eligible study participants. Of these, 195 participated and 161 (83%) met ACR clinical criteria for knee OA which was confirmed by a rheumatologist. These data indicate that it was possible to identify individuals with undiagnosed knee OA from pharmacies. Very importantly, we observed that 58% of patients who were identified tended to have minimal changes on X-ray (K-L grade 0 to 1) and were overweight or obese (> 70%). As such, these individuals would be prime candidates for an exercise and weight loss intervention as outlined in the current evidence-based guidelines (European League Against Rheumatism 2003, American College of Rheumatology 2000, and American Pain Society 2000). This group has potential to reduce the progression of their knee OA and improve quality of life, minimize pain and likely delay progression to joint replacement (Br J Sports Med. 2005;39:4-5).

Due to the success of this pilot study, we have embarked on PhIT-OA which is a larger prospective, comparative trial where patients have been randomized to: 1) a community-management intervention including patients, pharmacists, physiotherapists, and family physicians); or 2) "usual care". The primary objective of the PhIT-OA is to measure the effect of an education, assessment and referral intervention program initiated by community pharmacists working with patients, their family physicians and physiotherapists to improve the quality of management in knee OA. We expect preliminary results from PhIT-OA to be available in July 2009.

SUPPORT CDM - STUDY OF UNDERSTANDING PHARMACISTS' PERSPECTIVES ON REMUNERATION AND TRANSITION TOWARDS CHRONIC DISEASE MANAGEMENT - DISCRETE CHOICE EXPERIMENT (SUPPORT CDM)

With funding from the Canadian Foundation for Pharmacy, and in collaboration with Dr. Ross Tsuyuki at the University of Alberta, we are completing a study to determine pharmacists' preferences and desires as they relate to changes to their scope of practice. Specifically, we are asking pharmacists about their willingness to provide advanced services such as disease screening, medication reviews and disease state management. Today, across most of the world, pharmacists are responsible for the distribution of medications and have very little involvement in patient-centred activities and chronic disease management that are unrelated to dispensing. For example, when a client brings a prescription to a pharmacy, a pharmacist may provide drug information or answer questions about the prescription, but they rarely make any decisions on the appropriateness of therapy. Further, though pharmacists are responsible for assisting clients in selecting non-prescription medications for minor ailments, they are not compensated for the services they provide; rather, they are paid for the products they recommend.

To change the current model of pharmacy practice, pharmacists must be compensated for their services, but these compensation models must not be tied to the sale of medications. Many jurisdictions around the world have developed these alternative models, but poor uptake has meant that there are still many unanswered questions in regards to the best possible model. To answer some of these questions, we recently undertook a series of focus groups involving 36 pharmacists from all aspects of pharmacy practice. In discussion, pharmacists cited a number of challenges to providing new services including time constraints, poor relationships with physicians, patients and employers, limited access to clinical information and the absence of a model to follow for pharmacy practice change. That said, pharmacists with experience in disease management described some commonly cited 'challenges' (e.g., physician relationships) as enabling their own practice.



Pharmacist

With the focus groups as background, we have developed a discrete choice experiment to further understand pharmacists' preferences for a new practice model. To develop and encourage uptake of any new model, we need to understand what pharmacists are willing to trade-off to change practice, including their personal income, their professional service fees and their job satisfaction. Further, we also need to know how much education pharmacists would be willing to undertake and the setting in which they wish to practice. To date, we have recruited over 500 participants and are in the process of analyzing the results and sharing them with key decision makers through meetings and conference presentations including the Canadian Pharmacists Association Annual Meeting. We expect to publish the results of the study this year and implement our findings into future pharmacy services research.

SUPPORT II - STUDY OF UNDERSTANDING PATIENTS' PREFERENCES ON REMUNERATION AND TRANSITION TOWARDS PHARMACISTS PROVISION OF CHRONIC DISEASE MANAGEMENT (SUPPORT-CDM II)

Building on the aims of Support-CDM, the primary objective of Support-CDM II is to investigate patients' preferences for an increasing role of pharmacists and other allied health care professionals in the prescription of drug therapy for chronic disease management (CDM). The first phase of the project that involved focus group interviews to identify the attributes of CDM most important to patients with chronic diseases (e.g. practitioner type, time spent with practitioner, cost) is now complete. Specific characteristics of chronic disease managed that are identified as important to patients generated from the focus group interviews will then be merged with the available literature on CDM and used in the design of a discrete choice experiment questionnaire. The determination of what components of chronic disease management are most important to patients, specifically their desire for potentially receiving their chronic disease management and prescription medications from a pharmacist or other health care professional, will help to inform policy makers and guide upcoming changes in chronic disease management in Canada. The results of this study may support the broadening of the scope of pharmacy and nursing practice to include 'prescribing', chronic disease monitoring and/or ongoing chronic disease management.

A CLUSTER RANDOMIZED TRIAL OF PHARMACY-BASED IMMUNIZATION IN RURAL COMMUNITIES STRATEGY (PHICS)

Influenza is a major cause of potentially preventable morbidity and mortality in Canada. In British Columbia, influenza vaccine is provided free of charge to those at increased risk of severe disease and/or death from influenza infection, including the elderly (≥ 65 years) and younger patients with selected chronic health conditions. Despite access to free vaccine, adult immunization rates in the eligible population remain well below the National Advisory Committee on Immunization (NACI) recommended target of 90%, especially in small rural communities.

Pharmacists are readily accessible health care professionals who often have regular contact with individuals at increased risk for influenza illness and associated adverse outcomes. They are able to proactively and systematically review patients and remind them about the benefits of vaccination. Studies have shown that patient reminders are helpful in increasing vaccination rates. This study was designed to examine if a patient-focused strategy that utilizes pharmacy-based vaccination clinics can improve vaccination rates in small rural communities within British Columbia. To this end, pharmacists will provide a reminder letter to patients who are eligible for the influenza vaccine, as well as hold vaccination clinics where a nurse will administer the free vaccine. This is a three year CIHR- funded study with recruitment beginning in November 2009. Dr. Janusz Kaczorowski, an Associate CORE member from the Department of Family Practice at UBC, is working on this project with the CORE team.

While it is well recognized that pharmacists act as health advisors to the general public, and they are acknowledged as highly credible sources of health information, their roles could and should be expanded beyond the traditional product-oriented functions of dispensing medications. Community-based pharmacists are a very valuable but often underutilized health resource in most communities, especially as far as health promotion and disease prevention activities are concerned. The current project will evaluate the effectiveness of involving pharmacists from the small rural communities in Northern and Interior BC to increase the uptake of influenza vaccination in these communities.



*Dr. Janusz Kaczorowski
Department of Family Practice UBC*

Pharmacoepidemiology

CANCER INCIDENCE FOR PATIENTS WITH TYPE 2 DIABETES EXPOSED TO ORAL ANTIDIABETICS: ARE THERE DIFFERENCES BETWEEN AGENTS?

There is increasing evidence supporting an elevated risk of cancer among individuals with type 2 diabetes, including cellular, animal model and epidemiologic studies. The

association appears to be linked through the insulin and insulin-like growth factors. In fact, it has been proposed that hyperinsulinemia combined with insulin resistance promotes carcinogenesis. However, very little is known about the role that antidiabetic therapies play in this relationship. Given the biologically plausible link, therapies which increase circulating insulin levels in type 2 diabetes, such as sulfonylureas and exogenous insulin, may have detrimental effects on the cancer-related outcomes, compared to antidiabetic agents that reduce insulin resistance, such as metformin.

There is an increasing recognition of the relationship between type 2 diabetes and cancer. Our research has also identified a potential role for antidiabetic therapies in modifying that relationship. This CIHR-funded project is an extension of earlier work by our group, and capitalizes on the ability to link databases of BC Health with the BC Cancer Agency.

*Dr. Jeff Johnson
Department of Public Health Sciences,*



Together with Associate CORE member Dr. Jeffrey Johnson from ACHORD at the University of Alberta, we are conducting a retrospective, controlled, population-based cohort study using the British Columbia (BC) Linked Health Database, BC PharmaNet and the Cancer Registry. For our primary analysis, we are comparing the overall incidence of cancer among individuals with type 2 diabetes exposed to metformin therapy and patients exposed to sulfonylurea therapy, controlling for the underlying increased risk of cancer in the diabetes population by comparing these cohorts to individuals without type 2 diabetes.

From a public health perspective, the impact of the combination of type 2 diabetes and cancer is substantial. Both cancer and diabetes are prevalent in the general population and are chronic diseases with a relatively long duration. Cardiovascular disease, including macrovascular complications of type 2 diabetes, and cancer are two of the leading causes of death in Canada, and all three conditions place a large economic burden on our health care system. We feel that the results of this CIHR funded study will result in a substantial Canadian contribution to the area of cancer and diabetes epidemiology, and will have important implications for management of individuals with type 2 diabetes.

WHAT IS THE MAGNITUDE AND PATTERN OF ANTIBIOTIC CONSUMPTION IN CHILDREN WHO ARE DIAGNOSED WITH ASTHMA?

Little is known about the magnitude and patterns of antibiotic consumption in children with asthma relative to those without asthma. In our study, we hypothesized that children would have an increased rate of antibiotic prescriptions in the time period leading up to their diagnosis of asthma. Using population-based administrative healthcare data in British Columbia, 106,136 children with at least 6 years of follow-up from birth and 621,026 antibiotic dispensing episodes were identified. Of these, 91%

were not diagnosed with asthma according to validated definitions. The rate ratio (RR) of antibiotics dispensed to asthmatic as compared to nonasthmatic children was determined.

Potential confounders such as gender, age at asthma diagnosis, antibiotic exposure in first year, specialist visits, congenital anomalies, socioeconomic status and birth weight were adjusted for in the Poisson models. By six years, the RR of antibiotic consumption for asthmatics as compared to nonasthmatics varied between 1.66 to 2.32 depending on the year of asthma diagnosis. For the asthmatics, the adjusted RR of antibiotic consumption for the 1 month prior to asthma diagnosis compared to immediate 5 months prior was 1.66 (95% CI 1.60-1.71). The adjusted RR was lower in males (1.58, 95% CI 1.51-1.65) as compared to females (1.77, 95% CI 1.68-1.87), and lower in those who received antibiotics in the first year of life (1.60, 95% CI 1.53 -1.67) compared to those that did not (1.76, 95% 1.66-1.86). From this, we have concluded that there is higher antibiotic consumption in children with asthma as compared to those that are nonasthmatics. This consumption appears to be higher leading up to the diagnosis of asthma, indicating that early symptoms might be prompting antibiotic prescriptions.

Quantitative Risk-Benefit Analysis

Researchers, regulators, physicians and patients alike balance benefits and harms for health care interventions into their decision making. While necessary, this routine practice is not straightforward given the high degree of complexity and uncertainty associated with making trade-offs across multiple objectives. While there are currently no accepted quantitative methods for risk-benefit analysis, our research in this area has focused on developing and applying methods to quantitatively evaluate risks and benefits of drug therapy.

This methodology, and the projects that we have completed in this area, are based on an integration of health economics, pharmacoepidemiology and state-of-the-art computer simulation modeling. This line of research is unique to CORE; no other research group is working on this particular area of quantitative risk-benefit analysis. As such, Dr. Lynd has been actively involved in consultations with the European Medicine Agency (EMA) and the US Food and Drugs and Administration, and is a leading member of a “Decision-modeling Next Steps Working Group” that is involved in helping the US FDA and US PhRMA identify analytic methods that can be incorporated into regulatory decision-making. To date, we have completed two risk-benefit evaluations of prescriptions drugs – NSAIDs in rheumatoid arthritis and alosetron in irritable bowel syndrome. Other analyses are ongoing including the following study.

A QUANTITATIVE BENEFIT-RISK ANALYSIS OF LONG ACTING BETA AGONIST VERSUS INCREASING DOSES OF ICS IN ASTHMA – INCREMENTAL NET BENEFIT

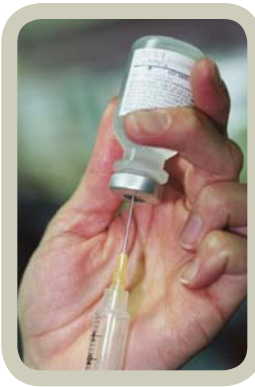
In December, 2008, a US Food and Drug Administration (FDA) advisory panel made a critical recommendation regarding the use of long-acting beta-agonists (LABAs) in asthma therapy, ruling to remove the asthma indication for single-entity LABAs for all age groups. The FDA advisory panel’s ruling allows for combination inhalers (LABA plus inhaled corticosteroid) to continue to be marketed for asthma treatment. The excess risk of asthma-related adverse events among individuals receiving LABA therapy has been a topic of concern, particularly since 2006 when boxed warnings were applied to products containing salmeterol following an increased risk of asthma-related death observed in the SMART study, a large, multi-center US clinical trial. Although LABAs have been associated with an increased risk of adverse events, the drugs have also been shown to confer additional benefit over simply increasing the dose of ICS among patients whose asthma continues to be uncontrolled. The benefit-risk analysis underway at CORE will take a quantitative approach to weighing the benefits and risks of LABA therapy specifically in the context of the standard therapeutic alternative, i.e. increasing the dosage of ICS. This study aims to inform regulatory decision-making surrounding LABA use outside the US, and provide further evidence of the utility of quantitative risk benefit analysis to help inform decision making.

Measuring Patients' Preferences Using Discrete Choice Experiments

Evolving from the risk-benefit analysis research, one of the primary components of a therapeutic decision is a patients' preference for different characteristics of alternative treatments. Given the importance of quantitatively measuring patients' preferences, we have developed expertise in Discrete Choice Experimentation (DCE). To date, we have completed two DCEs in asthma, and one in genetic testing to diagnose idiopathic intellectual disability. We are also in the process of conducting the following DCEs:

EVALUATING SOCIETAL PREFERENCES FOR THE HUMAN PAPILLOMAVIRUS VACCINES USING A DISCRETE CHOICE EXPERIMENT

The Human Papilloma Virus (HPV) is a small non-enveloped double stranded DNA virus.¹ The virus is extremely diverse consisting of over 100 different HPV subtypes and infection with it is associated with cancer, genital warts and respiratory papillomas. The risk of being infected with HPV if sexually active is 75% (thus 3 out of 4 persons). There are two vaccines currently available for the prevention of HPV infection. They are Gardasil™, a quadrivalent vaccine containing HPV types 6,11,16 and 18 which prevents both cervical cancer and genital warts and Cervarix™, a bivalent vaccine containing HPV types 16 and 18 and thus prevents only cervical cancer. The aim of this study is to determine public preferences for HPV vaccination and screening strategies using a discrete choice experiment



Participants from across Canada were recruited for the study, and the sample was representative of the Canadian population. They completed a choice-based questionnaire which required them to choose between different combinations of attribute levels, or opt for neither. These attributes were: (1) lifetime risk of cervical cancer (CC) and genital warts (GW); (2) frequency of Pap smear testing; (3) need for vaccine booster; (4) target group to vaccinate (girls only or girls and boys); (4) frequency of side effects and (5) cost of the vaccine.

We recruited 1275 participants for the study and the mean age was 44 years (SD=15.3). Twelve percent had less than high school education and 78% had either high school, trade, community college or some university education. Sixty percent earned \$55,000 or more as an annual income. Fifty-four percent of the participants were married, 49% were female and 46% had children. Of these, 86% had fully vaccinated their children against all childhood vaccines, 68% were considering the HPV vaccine, and 19% knew that their child was sexually active. Of the participants, 13% had either themselves or their partner experienced an HPV related illness (classified as an abnormal Pap smear test and an intervention or cervical cancer).

Respondents had a strong preference to avoid a yearly Pap smear and the most preferred frequency was every 3 years. Respondents also preferred a vaccine that would give lifelong immunity, that is, there was a preference for not receiving the booster dose. Respondents were more likely to choose a vaccination strategy which targeted both boys and girls rather than a strategy which targeted girls alone. Higher utility scores were obtained for vaccine options that had the ability to reduce the risk of genital warts infection compared to a vaccine which did not have genital warts coverage. However, respondents were willing to forego about 3% decrease in lifetime risk of genital warts to avoid a 1% increase in lifetime risk of cervical cancer. In conclusion, our study results show that society agrees with the introduction of the HPV vaccination program, but would prefer a vaccination strategy which targets both boys and girls and among the two HPV vaccines, Gardasil™ was preferred because of its ability to prevent genital wart infection.

EVALUATING PATIENTS' PREFERENCES FOR ALTERNATIVE ROUTES OF INSULIN DELIVERY

Approximately 5% of adult Canadians have diabetes, and it is suggested that this prevalence may be underestimated by up to 30% and may continue to increase. Many patients who could benefit from insulin therapy are either not using subcutaneous insulin at all, or are non-compliant. The first inhaled insulin, approved for use in 2006 as the first alternative to injectable insulin, was removed from the market less than two years later because of slow acceptance of the product. However, more alternatives like inhaled and oral insulin dosage forms continue to be investigated and may soon be available, and each dosage form has inherently different potential benefits and risks.

Despite newer approaches to insulin administration and diabetes management on the horizon, there is a paucity of information regarding how patients might 'value' alternative, non-injectable insulin. Therefore, we recently completed a DCE to determine patients' preferences for different attributes of insulin therapy, and evaluated differences in patients' preferences between type 1 and type 2 diabetics, and insulin users and insulin naïve patients.

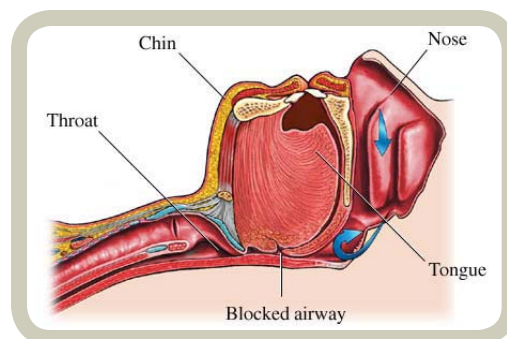
Overall, in this study we found that the most important attributes of insulin therapy to patients were blood sugar control and avoidance of adverse effects. However, of the different routes of administration, oral was preferred to inhaled or injectable. We also found that type 2 diabetics had stronger preferences for an alternative to subcutaneous insulin relative to insulin users. This suggests that once patients overcome the barrier and accommodate subcutaneous administration, other characteristics of management become more important.

Health Economics

Economic evaluation in health care continues to be a major research focus for CORE. Health care resources are limited, and difficult choices continue to be made regarding the best use of these resources to improve the health of Canadians. As such, systematic analyses such as the ones conducted by CORE are in high demand from various sectors of the health care community to aid in the decision making process. The analyses described below are selected examples from a broad collection of projects extending from evaluations of drugs and vaccines, to diagnostic strategies in tuberculosis and developmental delay using recent genetic techniques. CORE is proud of the high quality of economic evaluations that we produce and how they continue to be used to aid in decision making processes in various provinces throughout Canada.

COST-EFFECTIVENESS OF CPAP VERSUS ORAL APPLIANCES IN OBSTRUCTIVE SLEEP APNEA

Obstructive sleep apnea-hypopnea (OSAH) is a common disease characterized by repetitive pauses in breathing during sleep. Such episodes of apnea cause sleep fragmentation and daytime sleepiness which results in a decline in work productivity and is associated with motor-vehicle crashes and occupational injuries. Chronic OSAH also has a proven untoward effect on the cardiovascular system. Currently, continuous positive airway pressure (CPAP) is considered the standard of care in patients with OSAH. Oral appliances (OA) are commonly prescribed as a second-line treatment for this disease, but there is limited evidence on their cost-effectiveness. In this study we built a model to simulate the costs and benefits of treatment of OSAH with OA or CPAP based on their effects on quality of life, motor-vehicle crashes, and cardiovascular effects. The primary outcome was the incremental cost-effectiveness ratio (ICER) in terms of costs per 1 quality-adjusted life year (QALY) gained 5 years after treatment.



Sleep Apnea

Compared with no treatment, OA results in \$268 higher costs and an incremental QALY of 0.0899 per patient (ICER = \$2,984/QALY). Compared with OA, CPAP resulted in \$1917 more in costs and 0.0696 additional QALYs (ICER=\$27,540/QALY). For the most part in the sensitivity analyses, CPAP remained cost effective compared to OA, and OA remained cost-effective with respect to no treatment in almost all scenarios. OAs are less economically attractive than CPAP but remain a cost effective treatment for patients who are unwilling or unable to adhere to CPAP therapy. The results of this study were published in *Sleep Medicine*.

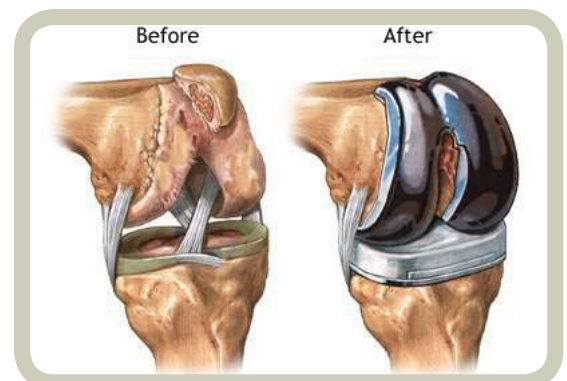
COST-EFFECTIVENESS OF SCREENING STRATEGIES FOR INCIDENTAL FINDINGS DISCOVERED ON MRI

Despite ongoing debate about how to approach clinically significant incidental findings in brain imaging studies, this issue has not been investigated from a health economics viewpoint. In this study, we assessed the benefit of various strategies using incidentally found intracranial aneurysms (IA) on magnetic resonance imaging (MRI) research scans as the model. In collaboration with colleagues at the National Core for Neuroethics at UBC (Drs. Judy Illes and David Li), we created a computer simulation of the natural history of IA. Model parameters were estimated from the literature and from a survey of experts. Four different screening strategies were modeled and their corresponding societal costs and quality-adjusted life years (QALY) were calculated for the lifetime of subjects. Depending on subjects' age group, gender and family history of IA, the best strategy varies between no routine review of brain scans, review of all scans by a neuroimaging specialist, and clinical-grade MRI examination and review. Review of the scans explicitly for incidental findings by a non-specialist is not an appropriate decision for any subgroup. We conclude that tailored screening based on research participant characteristics should accompany any ethics deliberation on this issue.

THE EVALUATION OF OUTCOMES ASSOCIATED WITH TOTAL AND UNICOMPARTMENTAL KNEE ARTHROPLASTY FOR OSTEOARTHRITIS

Approximately three million Canadians suffer from osteoarthritis. Knee replacement can reduce or alleviate joint pain and improve function in patients with degenerative end stage osteoarthritis of the knee. There are two general types of knee replacements: total and unicompartmental. Although total knee arthroplasty (TKA) has been shown to be a successful treatment for osteoarthritis of the knee, technological advancements, surgical expertise and proper patient selection in unicompartmental knee replacement (UKA) have offered results comparable to that of total knee arthroplasty. We sought to evaluate the validity of quality of life measurements in knee arthroplasty patients and differences in patient outcomes between these two alternative approaches.

Using data on over two hundred knee replacements collected between 2004 to 2006 from a study implemented at Richmond General Hospital, patients receiving a UKA and a TKA were compared six months following knee surgery using both generic and disease specific health measures and utility scores. Although it has been thought that TKA was used more frequently in patients with less severe knee OA, we found that the groups were comparable at baseline. After adjusting for all potential confounding variables, we did not find any significant differences in disease-specific or generic health measure scores between UKA and TKA groups. These findings may increase the frequency of less invasive UKA in patients who might have otherwise received a TKA. This study won the Best Poster Award at the Canadian Agency for Drugs and Technologies in Health (CADTH) 2009 Annual Symposium.



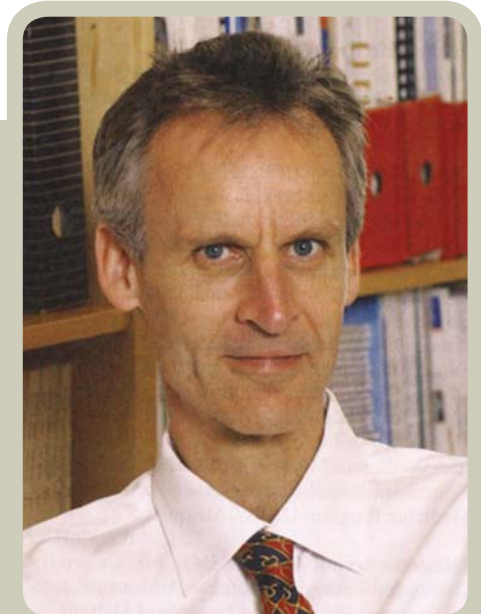
Knee Arthroplasty

THE ECONOMICS OF ELDERLY FALL PREVENTION

Falling and fall-related injuries are major health concerns for the growing elderly population. Prospective studies indicate that 40% of community dwelling persons > 75 years of age will experience at least one fall per year. Falls are the primary cause of seniors' hospitalizations, accounting for 86% of older adult injury-related hospital admissions, with 40% of residential care admissions fall-related. In addition, falls are the cause of 90% of all hip fractures. Research has shown that interventions targeted to improve balance and strength in elderly populations can reduce their incidence of falls. However, very little Canadian research has explored the costs of falls, or the cost effectiveness of programmes designed to reduce the risk of falling.

Under the supervision of Drs. Carlo Marra and Karim Khan, graduate students John Woolcott and Jennifer Faddegon are undertaking studies to fill this current research gap surrounding the economics of falls and fall prevention. John's work is focused on elderly fallers presenting to the Vancouver General Hospital Emergency Department, and will assess the type and costs of care received while in hospital. Jennifer's research will provide a cost effectiveness analysis of a multi-factorial, fall prevention study among elderly individuals who have previously experienced a fall. In addition, both John and Jennifer will be investigating the impact a fall has on an individual's health related quality of life.

John Woolcott is addressing an issue of critical relevance to the delivery of rapid and effective emergency department care – the progress of frail seniors who present with a fall-related injury. John's dedicated, 'hands-on' approach virtually living in the Emergency Department for days on end has provided him terrific research experience in the 'real world' setting and this complements his strong economics training. The results will identify costs of this group of patients for the first time in Canada and it will highlight bottlenecks that are amenable to intervention. Importantly, John will advance the field of 'operations research' in this clinical setting. The technique came from 'supply chain management' in manufacturing and is now increasingly being applied to the health care setting



Dr. Karim Khan Department of Family Practice, UBC



SPOTLIGHT ON OUR STATISTICIANS

LINDSEY COLLEY, BS, MSc

Lindsey received her Bachelor of Science Degree in Statistics from the University of Wales, Swansea, UK and her Master of



Lindsey Colley

Science in Statistics from the University of British Columbia, Vancouver, BC, Canada. After completing her Masters, Lindsey returned to England to work as a statistical consultant for a large pharmaceutical company where she acquired experience in the analyses and interpretation of clinical trial data. In 2006 Lindsey moved back to Vancouver to join CORE and has since worked on a number of projects gaining invaluable experience in a variety of statistical analyses. Projects have included looking at the effects of the withdrawal of rofecoxib from the market, and the risk of gastrointestinal events in a large cohort of rheumatoid arthritis patients using time dependent covariates in a Cox regression model.

One of Lindsey's primary research areas has been in the application and evaluation of different methods to model heterogeneity in patients' preferences derived from our discrete choice experiments (DCE) using mixed logit and latent class models. One

extensive evaluation of these analytic methods was applied in the DCE evaluating patients' preferences for route of insulin delivery and risks and benefits of diabetes treatment. This DCE measured preferences for fasting blood glucose control, hypoglycemic events, weight gain, route of administration and cost. A latent class model was used to evaluate if heterogeneity in patients' preferences existed. Socio-demographic variables were also investigated for inclusion in the final model based on their influence on class membership. The latent class analysis suggested that 5 classes existed in the sample and most parameter values were significant at the 5% significance level. The class probabilities indicated 38% of the respondents were members of class 1 (control most important), 24% of class 2 (route of administration most important), 15% of class 3 (cost most important), 13% of class 4 (weight most important) and the remaining 10% of class 5 (hypoglycemia most important). Those individuals in class 1 (control) were more likely to have low levels of HbA1c (4-7%) and a high household income (>\$50,000). Class 2 individuals (route of administration) tended to have a moderate income (\$20-50,000) and were insulin naïve. Class 3 individuals (cost) also tended to have a moderate income. Class 5 individuals (hypoglycemia) were more likely to have high levels of HbA1c (>10%). The identification of latent classes suggested the existence of heterogeneity in patients' preferences for different routes of insulin delivery and their associated risks and benefits.

In a second DCE with 196 patients, we measured patients' preferences for the different characteristics of asthma control included in the Global Initiative for Asthma (GINA) guidelines (i.e. activity, reliever medication use, emergency room visits, symptoms, and side effects). A mixed logit model was used to determine the relative importance of each criterion and to study the distribution of preferences. The majority of the estimated standard deviations in the mixed logit model were highly significant indicating that the parameters vary greatly in the population. The model suggests a large degree of variability around the utility levels for activity with some perhaps having preferences for high inactivity over some inactivity. Insignificant parameters on the standard deviation for asthma symptoms and chance of side effects indicated that every individual gained negative utility with increasing number of days of symptoms and percentage increase of chance of side effect. The mean and standard deviations of these coefficients also provided information on the share of the population that places a positive value on the asthma attribute and the share that places a negative value. The point estimates for the coefficient of emergency room visits implied that 98% of the population prefers having less visits. The results from both these DCEs underline the importance of accounting for preference heterogeneity when analyzing data from discrete choice experiments.

Lindsey has an important role with CORE as our senior statistician. But, we are going to miss her for several months this coming year as she embarks on the challenge of motherhood.

MAJA GRUBISIC, BSc, MSc, A. STAT

Maja received a Bachelor of Science Degree with a major in statistics and a thematic concentration in economics from the University of British Columbia, Vancouver, BC in 2004. She enrolled in the Master of Science program at Acadia University, Wolfville, Nova Scotia, and successfully defended her thesis in May 2006. Her thesis work was on metric development for medication compliance using a distribution approach. During her undergraduate career, she had an opportunity to work as a student research assistant and developed an interest in biostatistics. She pursued this interest as a research assistant at London Health Sciences Centre, which was her workplace during the internship component of her Master's program.

Since completing her degree, Maja has worked as a statistical analyst at London Health Sciences Centre in London, Ontario before moving back to Vancouver. She first worked as a statistician for the Center for Health Evaluation and Outcome Sciences and had the opportunity to work on large administrative databases and learn various statistical methods such as survival analysis. Maja then joined the Collaboration for Outcomes Research and Evaluation as a statistician in July 2008.



Maja Grubisic

One of Maja's current projects with CORE involves assessing the overall effectiveness of a day treatment program implemented in order to benefit patients with personality disorders. One hundred and ninety seven patients participated in the program, and of these, 125 completed the program. To assess the quality and effectiveness of the day treatment, patients were interviewed and provided with self-report questionnaires at the beginning, as well as at the completion of the program. These questionnaires measured the severity of symptoms and maladaptive behaviours associated with each personality disorder (PD). Besides these measures, four groups of confounding variables were evaluated as well: demographic, initial disturbance, diagnostic and severity of PD based on the self-report questionnaire with an interpersonal perspective of PDs. This project involved developing multivariate proportional odds models for 5 outcomes based on psychiatric symptoms and functioning measures, measured at baseline and at the end of the program. Predictors in each model were determined based on the backward stepwise approach. One of the preliminary results shows that the odds of improving are 0.32 times lower for the patients with the depressive disorders as compared to the patients with no depressive disorders (OR, 0.32; 95% CI, 0.11 to 0.99). This finding is based on the Global Severity Index self-report measure.

Another project Maja has been involved in quantifies the degree of agreement between area-based socio-economic status (SES) measures (income and education) and SES assessed at the individual level across different disease states, in particular, asthma, rheumatoid arthritis and diabetes. Many health care databases do not provide information on individual patient's education and income levels. Because of this, researchers can use the alternative approach involving indirect information based on aggregate values of social and economic conditions for geographic areas of residence. The advantage of this approach is that it is fairly inexpensive and information is easily accessible. The degree of nonrandom agreement between various area-based SES indices and the individual level SES was determined using kappa statistic and the intraclass correlation coefficient. The preliminary results concur with previous studies showing a fairly poor agreement between area and individual based measures in all disease states. This project also involved comparison of the results of analyses exploring the association between the 2 (area-based and individual) income and education estimates and utility measures such as EQ-5D and HUI3. The results present evidence that both income measures are associated with a stepped increase in EQ-5D and HUI3 scores as income levels increase.

Although only joining CORE late last year, Maja has had the pleasure of working on a variety of research projects in addition to those described here. She very much enjoys working with CORE and looks forward to new projects and challenges.



SPOTLIGHT ON OUR NEW STAFF

STEPHANIE HARVARD BAH, MSc

Stephanie is a recent Master of Science graduate of the Department of Community Health Sciences at the University of Manitoba. For her thesis, Stephanie worked closely with the Public Health Agency of Canada on the first wave of M-Track, a national “second-generation” HIV surveillance system that augments previous surveillance efforts by collecting behavioural data and blood specimens among men who have sex with men. Stephanie’s thesis spotlighted issues in survey design and administration and made recommendations for improving data quality in future waves of M-Track. Since working on M-Track in Winnipeg from 2005-2008, Stephanie has collaborated on Man Count, the M-Track study launched in Vancouver in 2008.



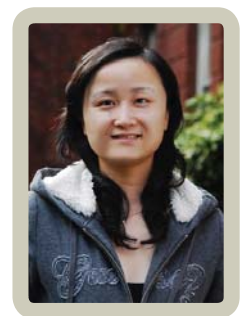
Stephanie Harvard

Stephanie’s graduate studies were supported by the Canadian Institutes of Health Research (CIHR) and the Western Regional Training Centre for Health Services Research (WRTC). As part of her WRTC studentship, Stephanie completed an internship at the BC Centre for Disease Control where she undertook a project analyzing regional variation in the distribution of harm reduction products in BC (Canadian Journal of Public Health, November/December 2008). Aside from health research, Stephanie’s greatest interest is writing, and following her internship, Stephanie stayed on at the BCCDC assisting with grant and manuscript writing.

Before entering health sciences, Stephanie took a BA in English and a BAH in Psychology at the University of Winnipeg. As Stephanie’s favorite research area in psychology is the perception of risk, Stephanie was delighted to learn that Dr. Lynd and Dr. Marra are interested in doing discrete choice experiments to elicit patients’ preferences for drug therapies where risk is always a factor to consider. Stephanie is now thrilled to be working with CORE as she reckons her job strikes a fine balance between epidemiology, psychology and writing.

JAIMEI LIU, BA, MA, MM

In December 2007, Jiamei Liu joined CORE as a Mathematical Modeler. She holds a Bachelor of Arts in Economics from Peking University, China, as well as a Master of Arts in Economics and a Masters of Management in Operations Research both from the University of British Columbia. Jiamei’s background has prepared her well for working in a field that requires the application of economic methodology to health research. Her expertise is mathematical simulation modeling and analysis where economic theories, mathematical models, statistical methods and stochastic processes are applied to economic evaluations. At CORE, these evaluations are done for a variety of healthcare specific projects.



Jiamei Liu

Operations research is an interdisciplinary branch of applied mathematics and formal science designed to determine the most efficient way to do something often involving the application of scientific methods and techniques to problems of decision making. Jiamei’s training in this area makes her very well suited to the specific type of health research conducted by CORE.

Currently, Jiamei is involved with cost-effectiveness and risk-benefit analysis projects for a number of pharmaceuticals. Although she does not have a background in pharmacy, by reviewing the pertinent literature and collaborating with members of CORE, she has been able to contribute her mathematical modeling expertise to a number of successful pharmacoepidemiological research endeavors. She is pleased to be able to work with CORE where she can fully apply her skills and education, while at the same time expanding her knowledge and experience.



GRADUATE STUDENTS

Post-doctoral Fellow

DR. KELLY GRINDROD

Before joining CORE in the spring of 2007, Kelly completed a B.Sc. in Pharmacy at the University of Alberta, a clinical residency at the University of Western Ontario Hospital in London Ontario, and most recently, finished her Doctor of Pharmacy degree at the University of British Columbia. She is registered pharmacist now working through a joint Post-Doctoral Fellowship with CORE and an M.Sc. with the UBC Faculty of Pharmaceutical Sciences. To support her work, Kelly received fellowship trainee awards from both the Michael Smith Foundation for Health Research and Canadian Institutes for Health Research.

Under the supervision of Drs. Carlo Marra and Larry Lynd, Kelly is involved in a variety of research projects within the organization. Her Masters training has included courses on epidemiology, statistical analysis and trial design. Her thesis work is focused on assessing potential remuneration models for pharmacist disease management services in the community setting. Specifically, in the SUPPORT-1 study, she is using a market research tool known as a discrete choice experiment to examine pharmacists' preferences and opinions on getting paid for new disease management services.

Through her post-doctoral training, Kelly is also involved in several other studies through CORE, including an assessment of what makes people with high blood pressure take antihypertensive therapy, a cost-effectiveness analysis of an intervention to reduce ovarian cancer, and the role of community pharmacists in arthritis. She is involved in teaching arthritis to the undergraduate and doctor of pharmacy students and organizes a community pharmacy journal club for pharmacists practicing in the Vancouver area (<http://www.pharmacyjc.blogspot.com>).

Doctor of Philosophy (Ph.D.) Candidates and Students

MR. JOHN C. WOOLCOTT

John joined CORE as a Ph.D. candidate within the UBC Faculty of Pharmaceutical Sciences with Drs. Carlo Marra and Karim Khan as his supervisors. His previous training was in the area of economics, focusing on health economics and economic evaluation. John is currently involved in a number of research projects for his Doctoral thesis in the area of falls in the elderly. Falls are a significant health problem for our aging population, with over 1/3 of all seniors falling each year, and over 80% of all injury related hospitalizations in individuals over 65 years of age due to falls. John's doctoral research is funded by the Michael Smith Foundation for Health Research and the Canadian Institutes of Health Research (Doctoral Research Award).

Ms. JENNIFER FADDEGON (NÉE DAVIS)

Jennifer commenced her Ph.D. studies within the Faculty of Health Care and Epidemiology at UBC in September 2006. Her co-supervisors are Drs. Carlo Marra and Karim Khan. Jennifer has a Bachelors (Honours) in Physiology and a Masters of Science in Experimental Medicine from UBC. For her doctoral thesis, Jen will be focusing on the areas of clinical and economic studies within falls prevention. Jennifer has received both a Michael Smith Foundation for Health Research Junior and Senior Trainee Award and CIHR doctoral research award for her doctoral project.

Dr. Na Guo

Na started her Ph.D. studies in Faculty of Pharmaceutical Sciences at UBC in September of 2006 under the supervision of Drs. Carlo Marra and Fawziah Marra. Prior to this, Na received her M.D. degree from Shandong University (China), and a Master of Public Health in Clinical Epidemiology from University of Alberta. Na's doctoral research is in the area of health-related quality of life in tuberculosis. Na has already completed several projects which have determined quality of life in patients with latent and active tuberculosis. Her final project will be a discrete choice experiment for eliciting patients' preferences in the delivery of latent tuberculosis treatment. As such, Na will be enrolling patients for her study from the TB Control clinic at the BC Centre for Disease Control and Vancouver General Hospital.

Mr. MEHDI NAJAFZADEH

Mehdi is a Ph.D. student with Dr. Carlo Marra. His research area is health outcomes evaluation and health economics. In addition to his M.A. in Economics from the University of British Columbia, Mehdi holds a B.Sc. in Electrical Engineering (Control Systems) from Sharif University of Technology and a M.Sc. degree in socioeconomic systems engineering from the Institute for Research on Planning and Development (IRPD) both located in Tehran, Iran. His research interests include applications of economic theory, mathematical modeling, statistical methods, preference assessment and stochastic processes in health technology assessment and in public health in general. For his PhD thesis, Mehdi is studying how emerging tools and technologies that become available due to advances in genomics (e.g. personalized medicine, discovery of biomarkers) will impact health care in Canada. More specifically, he is conducting a discrete choice experiment to explore barriers that primary care physicians may encounter in integrating personalized medicine into their regular practice. He will also study the potential benefits of genetic biomarkers for diseases like chronic obstructive pulmonary disease and lymphoma. Mehdi's doctoral research is funded by the Canadian Institutes of Health Research, as well as a University of British Columbia four-year Fellowship Award.

Dr. MOHSEN SADATSAFAVI

Mohsen is a Ph.D. student with Dr. Carlo Marra. He received his M.D. degree from Tehran University (Iran) and has a Masters of Health Sciences in epidemiology from UBC. Prior to starting his PhD, Mohsen worked for two years as a health economist with CORE during which time he conducted a number of studies on cost-effectiveness in the area of respiratory diseases including tuberculosis, asthma and chronic obstructive pulmonary disease. His PhD research area is in the value of information (VoI) analysis in economic evaluations. He will apply the results of his research in the assessment of screening for latent tuberculosis infection. Mohsen has received a Four Year Graduate Fellowship from the University of British Columbia for his doctoral research.

Master of Science (M.Sc.) Students

Ms. BRIDGETTE OTENG

Bridgette completed her Bachelors degree at Dalhousie University, Halifax N.S, majoring in both Biochemistry and Economics. She originally joined CORE in September of 2005 as a researcher. During this period, she worked on various outcome related projects and was the study coordinator for two major randomized controlled trials; the Pharmacist Identification of New Diagnostically-Confirmed Osteoarthritis (PHIND-OA) and Pharmacist-initiated intervention Trial in OsteoArthritis (PHIT-OA). In her capacity as study coordinator, she worked with other team members in designing and recruiting participants for both studies and also saw to the day to day management of both studies. Bridgette's interest in outcomes research led her to pursue an MSc degree with the Faculty of Pharmaceutical Sciences at UBC in September of 2007 under the supervision of Drs. Carlo and Fawziah Marra. She's currently in the final year of her studies and her thesis project involves using discrete choice experimentation in evaluating societal preferences of the new Human Papillomavirus vaccines.

Ms. KATIE SWEENEY

Katie joined CORE as a Master's Student under Dr. Larry Lynd's supervision in 2007. Before coming to UBC, Katie graduated from Niagara University in New York with a B.Sc. in biology with a pre-med concentration and a minor in criminal justice. Katie will be completing her MSc degree this year during which time she has been a member of the Pharmaceutical Sciences Graduate Student Society executive committee (PharGS) as well as a member of the organizing committee for the first annual Sala Hantle walk/run for AIDS prevention in Africa hosted by the Faculty of Pharmaceutical Sciences. Her M.Sc training has consisted of courses in epidemiology, pharmacoepemiology, statistical methods, economic evaluation and study design.

For her thesis, Katie has focused on outcomes evaluation in unicompartmental and total knee arthroplasty for the treatment of osteoarthritis. For surgeons treating patients suffering from osteoarthritis of the knee, this study will provide them with a better understanding of patient selection and help in determining the likely outcomes related to specific groups of patients. Furthermore, it will aid with proper procedure selection, as well as with expectations in terms of pain and disability following knee arthroplasty. Katie is in the final year of her Master of Science degree.

Ms. BELINDA CHEN

Belinda has recently graduated from UBC majoring in Cell Biology and Genetics. She started her Master of Science degree in September 2008 within the Faculty of Pharmaceutical Sciences and has just finished her coursework. She will be focusing on a project with Dr. Larry Lynd assessing how people with rheumatoid arthritis trade off the risk and benefits of NSAID therapy.

Ms. MYRA WANG

Myra received a B.Sc. degree from McGill University in Montreal, Quebec, with a major in Anatomy and Cell Biology and a minor in Pharmacology and Therapeutics. Myra has just completed her first year course work for her Master's. Under the supervision of Dr. Fawziah Marra, her thesis project will focus on the exposure of patients to fluoroquinolone antibiotics which could perhaps delay the diagnosis of tuberculosis.



GRANTS AWARDED IN 2008

Funding Source	Project Title	Funding Period
Canadian Institute for Health Research	A research and knowledge network on genetic health services and policy: building on the APOGEE-Net and CanGeneTest experiences	2008-2013
Canadian Institute for Health Research	Pharmacy-based immunization in rural communities strategy (PhICS)	2008 - 2011
Canadian Institute for Health Research	Centre for hip health and mobility: a team approach to mobility in vulnerable seniors	2008-2014
Michael Smith Foundation for Health Research	Effectiveness and cost-effectiveness of the HPV vaccine	2008 - 2010
Canadian Institute for Health Research	Cancer incidence for patients with type 2 diabetes exposed to oral hypoglycemic: are there differences between agents?	2008 - 2010
Canadian Institute for Health Research	Evaluating the association between inhaled corticosteroid and statin use on lung cancer in COPD: a BC linked health database study	2008-2010
Canadian Institute for Health Research	Major depression and health status changes	2008 – 2010
Canadian Institute for Health Research	Study of understanding patients' preferences on remuneration and transition towards pharmacists' provision of chronic disease management	2008 -2010



PUBLICATIONS

Selected Peer-Reviewed Publications in 2008

Marra F, Marra CA, Sadatsafavi M, Morán-Mendoza O, Cook V, Elwood RK, Morshed M, Brunham RC, Fitzgerald JM. Cost-effectiveness of a new interferon-based blood assay, QuantiFERON(R)-TB Gold, in screening tuberculosis contacts. *Int J Tuberc Lung Dis.* 2008 Dec;12(12):1414-24.

Najafzadeh M, Marra CA, Sadatsafavi M, Aaron SD, Sullivan SD, Vandemheen KL, Jones PW, Fitzgerald JM. Cost effectiveness of therapy with combinations of long acting bronchodilators and inhaled steroids for treatment of COPD. *Thorax.* 2008 Nov;63(11):962-7.

McTaggart-Cowan HM, Shi P, Fitzgerald JM, Anis AH, Kopec JA, Bai TR, Soon JA, Lynd LD. An evaluation of patients' willingness to trade symptom-free days for asthma-related treatment risks: a discrete choice experiment. *J Asthma.* 2008 Oct;45(8):630-8.

Ogrodniczuk JS, Joyce AS, Lynd LD, Piper WE, Steinberg PI, Richardson K. Predictors of premature termination of day treatment for personality disorder. *Psychother Psychosom.* 2008 Oct;77:365-71.

Kwong JC, Stukel TA, McGeer AJ, Upshur RE, Thompson WW, Johansen H, Thiruchelvam D, Marra F, Svenson LW, Manuel DG. The effect of universal influenza immunization on visits to emergency departments and doctors' offices. *PLoS Med.* 2008 Oct;5(10):e211.

Zhang W, Bansback N, Guh D, Li X, Nosyk B, Marra CA, Anis AH. Short-term influence of adalimumab on work productivity outcomes in patients with rheumatoid arthritis. *J Rheumatol.* 2008 Sep;35(9):1729-36.

Najafzadeh M, Sadatsafavi M, Marra CA. Letter to the Editor. Interpretation of results of the cost-effectiveness analysis reported by Pellissier et al. on October 2007. *Vaccine.* 2008 Sep 26;26(41):5244.

Ogilvie GS, Remple VP, Marra F, McNeil SA, Naus M, Pielak KL, Ehlen TG, Dobson SR, Money DM, Patrick DM. Intention of parents to have male children vaccinated with the HPV vaccine. *Sex Transm Infect.* 2008 Aug;84(4):318-23.

Bansback NJ, Anis AH, Marra CA. Patient reported outcomes for rheumatoid arthritis: where are we and where are we going? *J Rheumatol.* 2008 Aug;35(8):1482-3.

Sadatsafavi M, Najafzadeh M, Lynd LD, Marra CA. Reliability studies are not using enough observers for robust estimation of observer agreement: a simulation study. *J Clin Epidemiol.* 2008 Jul;61(7):722-7.

Bansback N, Harrison M, Brazier J, Davies L, Kopec J, Marra C, Symmons D, Anis A. Health state utility values: A description of their development and application for rheumatic diseases. *Arthritis Rheum.* 2008 Jul 15;59(7):1018-26.

Sadatsafavi M, Najafzadeh M, Marra CA. Acceptability curves could be misleading when correlated strategies are compared. *Medical Decision Making.* Jun 2008; 28:306 - 307.

Guo N, Marra CA, Marra F, Moadebi S, Elwood RK, Fitzgerald JM. Health State Utilities in Latent and Active Tuberculosis. *Value Health.* 2008;11(7):1154-61.

Tan MC, Marra CA, Sadatsafavi M, Marra F, Morán-Mendoza O, Moadebi S, Elwood RK, Fitzgerald JM. Cost-Effectiveness of LTBI Treatment for TB Contacts in British Columbia. *Value Health.* 2008;11(5):842-52.

McTaggart-Cowan HM, Marra CA, Yang Y, Brazier JE, Kopec JA, Fitzgerald JM, Anis AH, Lynd LD. The validity of generic and condition-specific preference-based instruments: the ability to discriminate asthma control status. *Qual Life Res.* 2008 Apr;17(3):453-62.

Tan M, Ayas NT, Fitzgerald JM, White DP, Schulzer M, Fleetham J, Cooper P, Marra CA. The cost-effectiveness of continuous positive airway pressure therapy for obstructive sleep apnea hypopnea. *Canadian Respiratory Journal.* 2008 Apr;15(3):159-65.

Lynd LD, Richardson KJ, Purssell RA, Abu-Laban RB, Brubacher JR, Lepik KJ, Sivilotti ML. An evaluation of the osmole gap as a screening test for toxic alcohol poisoning. *BMC Emerg Med.* 2008 Apr 28;8:5.

Marra CA, Marra F, Colley L, Moadebi S, Elwood RK, Fitzgerald JM. Health-Related Quality of Life Trajectories among Adults with Tuberculosis: Differences between Latent and Active Infection. *Chest* 2008 Feb;133(2):396-403.

Alghanim N, Comondore VR, Fleetham J, Marra CA, Ayas NT. The economic impact of Obstructive Sleep Apnea. *Lung*. 2008 Jan-Feb;186(1):7-12.

Selected Presentations in 2008

Marra F. Use of antivirals for influenza treatment and prophylaxis. Vancouver Hospital and Health Sciences Centre Infectious Diseases Resident Rounds, Vancouver, British Columbia, December 2008.

Marra F. Consumption of antibiotics in the first year of life and development of asthma. Vancouver Hospital and Health Sciences Centre, Clinical Epidemiology Department, Vancouver, British Columbia, November 2008.

Marra F. Economic evaluations in public health: examples from the trenches. Interprofessional Health Economic Workshop, Vancouver, British Columbia, October 2008.

Marra CA. Incorporating Quality in Everyday Practice to Prevent Medication Errors (invited talk). ACR/ARHP Annual Scientific Meeting, San Francisco, California, October, 2008.

Lynd LD. Applications of incremental net benefit to quantitative risk benefit analysis. The future of drug safety research: an interdisciplinary environment. Erasmus University. Erasmus Expo and Congress Centre, Netherlands, October, 2008.

Lynd LD. Applications of pharmacoeconomics to re-imbursement of expensive drugs for rare diseases. BC Ministry of Health Expensive Drugs for Rare Disease Advisory Committee. Vancouver, British Columbia, October, 2008.

Marra F. Train the trainer session on HPV vaccination for academic detailers. Pharmacare – Ministry of Health, Vancouver, British Columbia, September 2008.

Marra F. Train the trainer session on DBND Program for Pharmacists. BC Centre for Disease Control, Vancouver, British Columbia, June 2008.

Marra F. HPV vaccine. What should we do for Cindy Lou Who? Therapeutics Initiative Conference, Vancouver, British Columbia, April 2008.

Marra F. New vaccines on the market CSHP (BC Branch) – Spring Meeting, Vancouver, British Columbia, April 2008.

Marra CA. Principles of economic evaluation. Drug Benefits Committee, Ministry of Health, Vancouver, British Columbia, April 2008.

Lynd LD. The economics of drug coverage in Canada. UBC Department of Medicine Internal Medicine Residents Whistler Conference, Advocacy in Action, Whistler, British Columbia, March 2008.

Marra CA. Health Economics in TB. Lung Health Research Day, Wall Centre Hotel, Vancouver, British Columbia, March, 2008.

Marra CA. Cost-Effectiveness of Therapy with Combinations of Long-Acting Bronchodilators and Inhaled Steroids for Treatment of COPD: An Economic Evaluation of the OPTIMAL Study. Respiratory Research Rounds, Diamond Health Centre, Vancouver, British Columbia, March 2008.

Selected Conference Abstracts in 2008

Kwong J, Maaten S, Patrick DM, Marra F. Universal influenza immunization in Ontario and use of antibiotics. 8th Canadian Immunization Conference, Toronto, Ontario, November 30 – December 3, 2008.

Davis JC, Robertson MC, Ashe MC, Khan KM, Marra C. Economic Evaluation of Falls Prevention Strategies: Systematic Review. BC Injury Prevention Conference, Vancouver, British Columbia, November 19-20, 2008.

Ogilvie GS, Dobson S, Dawar M, Scheifele D, Kollmann T, McNeill SA, Halperin S, Langley J, Dionne M, Picard M-E, Sauvageau C, Krjaden M, Marra F, Miller D, Money D, Naus M, Singer J, Young E. A controlled trial to assess the immunogenicity of a proposed paediatric dosing schedule of human papillomavirus vaccine. Eurogin, Nice, France, November 12-15, 2008.

Marra F, Kaczorowski J, Marra CA, Lynd L, Tsuyuki R, Kendall P, Brunham RC. Pharmacy based immunization in rural communities' strategies. Pandemic Influenza Preparedness Strategic Planning Meeting, Winnipeg, Manitoba, November 6-8, 2008.

Marra CA, Kopec JA, Sayre E, Grindrod K, Oteng B, Gastonguay L, Soon JA, Cibere J, Esdaile JM. The PAT-5D-QOL: An Adaptive, IRT-Based Questionnaire to Assess Health-Related Quality of Life in Arthritis. ISOQOL, Montevideo, Uruguay, October 22 – 25, 2008.

Lynd LD, Fitzgerald M, Colley L, Soon J. Establishing Patients' Preference Weights for GINA Criteria of Asthma Control: A Discrete Choice Experiment. ISOQOL, Montevideo, Uruguay, October 22 – 25, 2008.

Woolcott JC, Marra CA, Shi P. The Impact of Arthritis Type on Health Related Quality of Life: Results from a Population-based Survey. ISOQOL, Montevideo, Uruguay. October 22 – 25, 2008.

Sayre E, Kopec JA, Marra CA. Performance of the Item Response Theory Scoring of the Computerized Adaptive Test in Five Domains of Quality of Life: a Simulation Study. ISOQOL, Montevideo, Uruguay, October 22 – 25, 2008.

Maxwell CJ, Jantzi M, Poss J, Wodchis W, Hogan D, Supina A, Lynd L, Marra C, Hirdes JP. Construct validity of an observed health-related quality of life (HRQL) measure in Alzheimer's disease. (Oral Presentation) presented at the 15th Annual Conference of the International Society for Quality of Life Research, Montevideo Uruguay, October 22-25, 2008.

Davis JC, Robertson MC, Ashe MC, Khan KM, Marra C. Economic Evaluation of Falls Prevention Strategies: Systematic Review. 3rd Australian and New Zealand Falls Prevention (ANZFP) Conference, Melbourne, Australia, October 12-14, 2008.

Maaten S, Kwong J, Patrick DM, Marra F. The effect of universal influenza immunization on antibiotic prescriptions. Third European Influenza Conference, Vilamoura, Portugal, Spain, September 14-17, 2008.

Pourbohloul B, Ogilvie G, Marra F, Marra CA, Naus M, Patrick DM, Duval B, Brunham RC. Decision-making support through dynamic modeling for optimal use of HPV vaccines: the impact of the duration of protection on program selection. World Cancer Congress, Geneva, Switzerland, August 27 – 31, 2008.

Lynd LD. Did the removal of rofecoxib from the market result in increased gastrointestinal risk for rheumatoid arthritis patients? A population based analysis. Annual European Congress of Rheumatology EULAR, Paris, France, June 11-14, 2008.

Buxton J and the Harm Reduction Work Group. An Evidence-informed Approach to Enhancing the Distribution of Provincial Harm Reduction Supplies. Canadian Public Health Association annual conference, Halifax, Nova Scotia, June 1-4, 2008.

Rosenthal M, Grindrod K, Lynd LD, Marra CA, Wilgosh C, Bougher D, Tsuyuki RT. Study of Understanding Pharmacists' Perspectives on Remuneration and Transition towards Chronic Disease Management (SUPPORT- CDM): Qualitative Methods (Part 1 of 3). Canadian Pharmacists Association Annual General Meeting, Victoria, British Columbia, May 31-June 3, 2008.

Grindrod K, Rosenthal M, Lynd LD, Marra CA, Wilgosh C, Bougher D, Tsuyuki RT. Study of Understanding Pharmacists' Perspectives on Remuneration and Transition towards Chronic Disease Management (SUPPORT- CDM): Challenges & Enablers (Part 2 of 3). Canadian Pharmacists Association Annual General Meeting, Victoria, British Columbia, May 31-June 3, 2008.

Rosenthal M, Grindrod K, Lynd LD, Marra CA, Wilgosh C, Bougher D, Tsuyuki RT. Study of Understanding Pharmacists' Perspectives on Remuneration and Transition towards Chronic Disease Management (SUPPORT- CDM): Remuneration (Part 3 of 3). Canadian Pharmacists Association Annual General Meeting, Victoria, British Columbia, May 31-June 3, 2008.

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Blondel-Hill E, Dreher K, Patrick DM, Marra F, Do Bugs Need Drugs? Working Group. Implementation of the Do Bugs Need Drugs? program in British Columbia, Canada. 18th European Congress of Clinical Microbiology and Infectious Diseases, Barcelona, Spain, April 19 – 22, 2008.

Marra F, Chong M, Patrick DM. Why are we using so many antibiotics for acute bronchitis? 18th European Congress of Clinical Microbiology and Infectious Diseases, Barcelona, Spain, April 19 – 22, 2008.

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