Collaboration for
Outcomes
Research and
Evaluation

Collaboration for Outcomes Research and Evaluation

Annual Report 2007

Table of Contents

A Word from the Director of CORE

Dr. Carlo Marra

Photo courtesy of MSFHR

We are pleased to issue the first Annual report for the Collaboration for Outcomes Research and Evaluation (CORE) located within the Faculty of Pharmaceutical Sciences at the University of British Columbia. Since this is our first report, I would like to take this opportunity to briefly introduce CORE and highlight some of the exciting projects that our group was involved with during 2007/2008.

CORE has been in existence since 2000 when it was created with a generous endowment from the David Collins Dawson Fund. Since its inception, CORE has grown into a multidisciplinary group of researchers with expertise in clinical pharmacy, medicine, pharmacoepidemiology, health economics, health services research, risk-benefit analysis program evaluation and health promotion research. The main group of researchers has their primary academic appointments within the Faculty of Pharmaceutical Sciences at the University of British Columbia, however there are a variety of collaborators from various Departments in the Faculty of Medicine and from the University of Alberta. More details about the structure and staff of CORE can be found at http://www.core.ubc.ca.

This past year has seen several exciting developments within CORE. We relocated our office space to the Centre for Health Evaluation and Outcome Sciences at St. Paul's Hospital which complements our existing space on the University of British Columbia's Point Grey Campus. Also, through successful applications to the Canadian Foundation for Innovation and the B.C. Knowledge Development fund, we purchased a blade cluster and two web servers which greatly increases our processing power and enables rapid analysis of large datasets, mathematical modeling, and sophisticated methods for field data collection. Together, with CORE associate Dr. Mark Fitzgerald, we were successful in obtaining a $1 million grant from the National Sanitorium Association to establish a Respiratory Evaluative Sciences Program (RESP) to conduct health technology assessments in respiratory conditions. We continued our work in pharmacy practice research with the initiation of a pragmatic randomized controlled trial comparing usual care to a comprehensive multidisciplinary strategy for osteoarthritis of the knee with results anticipated towards the end of 2008. We are collaborating with Dr. Ross Tsuyuki on a novel project funded by the Canadian Foundation for Pharmacy evaluating remuneration strategies for community pharmacists for the provision of comprehensive care. Our research programs in risk-benefit analysis and cost-effectiveness analysis continued to expand with evaluations of nonsteroidal anti-inflammatory drugs, alosetron, vaccines, new genetic technologies, COPD medications and treatments for obstructive sleep apnea.

We continue to attract very highly qualified personnel and were happy to have Salma Lalji, Jiamei Lui and Jocelyn Wentland join our group this past year. In addition, our complement of students and trainees continues to grow with Dr. Kelly Grindrod (post-Pharm.D. fellow/MSc student), Katie Sweeney (MSc student), Bridgette Oteng (MSc student) and Mehdi Najafzadeh (PhD student) joining us in September, 2007. Na Guo (2nd year PhD student), Jennifer Faddegon (2nd year PhD student) and John Woolcott (3rd year PhD student) continue to excel in their programs and have made significant strides with their projects.

With a successful year behind us, we are looking forward to challenges and opportunities in 2008/2009 and hope to surpass this year.

Respectfully submitted,

Carlo Marra, Pharm.D., PhD, FCSHP
Assistant 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

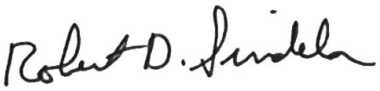
A Word from the Dean of the Faculty of Pharmaceutical Sciences

Dr. Robert Sindelar

Welcome and greetings to the very first edition of the Annual Report of CORE, the Collaboration for Outcomes Research and Evaluation. While this is CORE's first report, CORE is an internationally recognized and highly respected collaborative research team that that was founded in 2000 in the Faculty of Pharmaceutical Sciences at The University of British Columbia (UBC). CORE's visionary leadership, initially Dr. David W. Fielding and particularly Dr. Carlo A. Marra the last several years, have transformed this major Faculty initiative into a multidisciplinary group of researchers committed to minimize risk and maximize the clinical benefits, quality of life benefits, and economic benefits of drug therapy. CORE Members, CORE Associates, and Staff from The UBC Faculty of Pharmaceutical Sciences, The UBC Faculty of Medicine, and The University of Alberta Faculty of Medicine among other important affiliations effectively meld exceptionally strong research expertise in clinical pharmacy, medical care, health economics, pharmacoepidemiology, patient safety, risk-analysis, health promotion, and other health outcomes-related fields, to generate fundamental new knowledge that may readily translate to improved drug therapy and better health outcomes.

Since 2000, we have witnessed major growth in the cadre of researchers, the breath of expertise, the impact of their research, and the supportive environment in which CORE functions. CORE's Faculty, Associate, and Staff complement have not only expanded significantly by recruiting the very best, they have increasingly been recognized for their research rigor and success. This first Annual Report not only introduces our broad stakeholder community to CORE, but also summarizes the remarkable accomplishments of CORE's researchers during the academic year 2007/2008. As you read this report, you will note highlights of CORE's many strengths; their people, their funding, their research, their impact, and their vision for the future. The report's contents include membership, mission, research themes, graduate students, and publications and presentations. This report recounts the significant efforts of the many men and women who throughout this past year have contributed in so many different ways to make a lasting impact on drug therapy outcomes. Thus, I proudly welcome you to the very first edition of the Annual Report of CORE and thank you for your interest.

Sincerely,



Robert D. Sindelar, PhD
Professor and Dean
Faculty of Pharmaceutical Sciences
The University of British Columbia

Members of CORE

Leadership

Carlo A. Marra, BSc (Pharm), PharmD, PhD, FCSHP
Director, CORE; Assistant 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

Mary H. H. 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.

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

Marc Levine, BSc, BSc (Pharm), PhD
Professor, 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, 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.

Members of CORE

Associates

Aslam Anis, PhD
Director, Centre for Health Evaluation and Outcome Sciences; Professor, Department of Health Care and Epidemiology, University of British Columbia.

John Esdaile, MD, MPH, FRCPC
Scientific Director, Arthritis Research Centre of Canada; Professor, Division of Rheumatology, Department of Medicine, University of British Columbia.

Mark Fitzgerald, MB, MD, FRCP(I), FRCP(C), FACCP
Director, Centre for Clinical Epidemiology and Evaluation, Vancouver Coastal Health Research Institute; Professor, Faculty of Medicine, University of British Columbia; Head, Respiratory Medicine Division, Vancouver General Hospital.

Jeff Johnson, BSP, 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).

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.

Karim Khan, MD, PhD, FACSP
Associate Professor, Department of Family Practice, University of British Columbia.

Steve Morgan, BA (Hons), MA, PhD
Assistant Professor, Department of Health Care and Epidemiology, University of British Columbia.

Ross Tsuyuki, BSc (PharmD), MSc (Clin Epi.) FCSHP
Director, EPICORE (Epidemiology Coordinating and Research Centre); Professor of Medicine, Division of Cardiology, University of Alberta.

Researchers

Lindsey Colley, BSc, MSc, Statistician
Louise Gastonguay, RN, BSc, MSA, Clinical Research Manager
Jiamei Liu, BA, MA, MM, Mathematical Modeler
Nancy Makela, BScN, RN, Research Nurse
Mohsen Sadatsafavi, MD, MHSc, Health Economist
Jocelyn Wentland, BA, MSc, Research Associate

Staff

Kristin Westland, BA, Administrative Manager
Salma Lalji, Research Data Technician

About CORE

University of British Columbia

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

The mission of the University of British Columbia's Collaboration for Outcomes Research and Evaluation (CORE) is to improve health-care related outcomes for drug therapy through the application of the best in research, education, and practice enhancement strategies.

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 Director of the CPRN is Dr. Judith Soon. In the past year, the number of research-oriented community pharmacies in the CPRN has expanded from 150 to 187, an increase of 25%. 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 for chronic diseases such as osteoarthritis, diabetes and asthma. These collaborative projects often involve health policy decision-makers, academics, advocacy groups, as well as community health care professionals. Some of these studies are described below.

Pharmacist Identification of New, Diagnostically Confirmed Osteoarthritis (PhIND-OA) and Pharmacist-Initiated Intervention Trial in Osteoarthritis (PhIT-OA)

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 community pharmacists, 274 were deemed to be eligible study participants. Of these, 195 participated and 161 (83%) met ACR clinical criteria for knee OA, as confirmed by a rheumatologist. These data indicate that it is possible to identify individuals with undiagnosed knee OA from pharmacies. Very importantly, we observed that patients who were identified tended (58%) 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). These patients have the 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 now started PhIT-OA which is a larger prospective, comparative trial where patients will be 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 study 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.

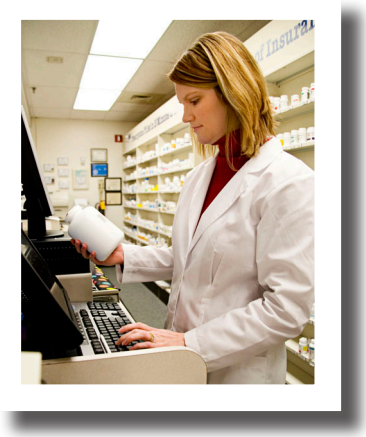
"It is a real pleasure to work with our colleagues at CORE who share our vision of public health approaches to disease management and evidence-based pharmacy practice, all with the ultimate goal of improved patient care and outcomes."

Dr. Ross Tsuyuki

Patient-Centered Pharmacy Practice Clinic on Haida Gwaii

Despite public health efforts, gaps remain between the overall health status of First Nations people and other British Columbia residents. Recent federal and provincial initiatives have developed enabling strategies to facilitate innovative, culturally-sensitive programs that will make a difference to health-related patient outcomes in First Nations communities. Many jurisdictions are now considering ways in which to broaden the role of pharmacists to optimize the safe and effective use of medications and provide patient-centered, outcomes-focused care. The overall goal of this proposal is to initiate planning for a patient-centered pharmacy practice clinic in the Haida community of Skidegate on the Queen Charlotte Islands using a collaborative participatory model. Phase I of the proposal involves a community-based needs assessment of community stakeholders, health care professionals and regional health policy decision makers, in active collaboration with the local pharmacist on the Queen Charlotte Islands. Utilizing the BC Linked Health Database, BC Vital Statistics and Health Canada's First Nations and Inuit Health Branch data, baseline analyses on disease prevalence and medication use will be conducted which will enable performance tracking of pharmacy-related health outcomes over time.

Phase II will initiate programs as determined by the community-based participatory needs assessment, provide evidence-based continuing education for health care professionals, initiate peer community outreach activities designed to enhance interest in health professions as a career option among high school students, and provide cross-training opportunities with other health professionals for Faculty of Pharmaceutical Sciences undergraduate and graduate students. A comprehensive evaluation will be conducted to generate evidence useful to determine whether this patient-centered pharmacy practice clinic can improve health care outcomes and increase health professional capacity in rural and northern British Columbia. Discussions are currently underway with the BC Ministry of Health and Aboriginal Health.



Pharmacist

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 pharmacoepidemiology, health economics, 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. Dr. Lynd has been actively involved in consultations with the European Medicine Agency (EMEA) 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, CORE has completed two risk-benefit evaluations of prescription drugs.

A quantitative benefit-risk analysis of rofecoxib relative to naproxen using an incremental net-benefit model

In September 2004, rofecoxib was voluntarily withdrawn from the market over concerns of increased risk of myocardial infarction relative to other non-steroidal antinflammatory drugs (NSAIDS), despite having a lower risk of serious gastrointestinal side effects. This decision was made without jointly considering the potential risks and benefits. Therefore, we performed a quantitative benefit-risk analysis of rofecoxib relative to naproxen using a discrete event simulation model and Monte Carlo simulation. We found that despite an increased risk of cardiovascular adverse events, there was a 95% chance that the incremental net benefit for rofecoxib was zero or greater, suggesting that the expected benefits outweigh the risks in patients with arthritis.

Using the incremental net-benefit framework to evaluate alosetron for the treatment of irritable bowel syndrome (IBS)

Alosetron was removed from the US marked previously due to concerns over risk of ischemic bowel disease, but was later re-introduced. We performed a quantitative risk-benefit analysis of this regulatory decision. Using phase III clinical trial data, post-marketing epidemiologic data, and patients' preferences for the outcomes derived using a discrete choice experiment, we developed a discrete event simulation model to evaluate the incremental net benefit of alosetron relative to standard treatment in moderate to severe IBS. In our analysis, we quantitatively demonstrated that the potential benefits of alosetron outweigh the potential risks, which was in agreement with the regulatory decision. In fact, we showed that there is almost a 100% chance that the potential benefits outweigh the potential harms. We also showed that the benefits are greater in IBS patients with more severe symptoms which reinforces the need to limit the use of this drug to these patients.

Measuring Patients' Preferences Using Discrete Choice Experiments

Evolving from the risk-benefit analysis research, one of the primary components of a therapeutic decision is patients' preferences 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 for mental retardation.

Specifically, we conducted a DCE in 157 adult asthma patients to determine their willingness to accept risk in exchange for some benefit or convenience, and their willingness to pay for additional benefit, or to avoid risk. The custom-designed DCE measured preferences for treatment effectiveness (symptom-free days), potential risk (oral thrush and tremor/heart palpitation), ease of use (frequency of daily administration and number of inhalers required), and cost. A nested logit model was used to determine the relative preferences of each attribute from which the marginal rates of substitution were calculated. We found that on average, patients were willing to pay an additional $14 per month to receive one additional symptom-free day, and $26, $79, and $112 monthly to avoid one, two and three annual episodes of oral thrush, respectively. Overall, we found that patients preferred treatments that offered more symptom-free days but they were willing to trade days without symptoms in exchange for a reduction in adverse events and greater convenience.

Dr. Larry Lynd

In a second asthma study 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). We found that characteristics of asthma control were significant, suggesting that they are all important to patients. However, we also found that the most important attribute was the level of activity where respondents were the least likely to choose a treatment option in which their activity would be 'very limited'. The next most important attribute was night time awakenings, followed by having to visit the emergency 2 times per year (β= -2.44). Given that Dr. Mark FitzGerald was a collaborator on this project and is also a member of the GINA Scientific Committee, these results will help to inform the committee on the ongoing revision of the guidelines.

Reproductive Health

Dr. Judith Soon

CORE has developed expertise committed to informing the development and evaluation of interventions at the community- and population-level to improve sexual and reproductive health. Initiatives often involve multidisciplinary and multi-centre collaborations with researchers in the UBC School of Population & Public Health, Simon Fraser University, University of Northern British Columbia, University of Victoria and the Northern Health Authority. An ongoing and comprehensive research program into the public health impact of pharmacist provision of emergency contraception has attracted interest from scientists around the world. Using unique population-based, patient-specific data and the BC Linked Health Databases, unparalleled information is available with which to evaluate impact of changing emergency contraception from prescription to non-prescription status. An evolving CIHR-funded mixed-methods research program is also beginning to address disparities in pregnancy and abortion rates in rural and northern British Columbia, which are 60% higher than the provincial average. Gender, place and culture help shape social interactions and structural conditions that put the sexual health of many youth at risk. Ethnographic research into youth perceptions around barriers to accessing and using contraception effectively is positioned to inform future targeted and tailored community-based pubic health interventions. These collaborative projects involve health care professionals, decision-makers, academics, advocacy groups, community stakeholders.

Effectiveness of Emergency Contraceptives: Population-based Comparison of Two Regimens for Emergency Contraception

Abortion related to unwanted pregnancy is a major health issue. There are over 800,000 women of child-bearing age residing in British Columbia among whom 14,000-16,000 induced abortions are performed each year. Hormonal emergency contraceptives (ECs) have the potential to reduce the risk of pregnancy and subsequent abortion. The most commonly used ECs are the Yuzpe regimen, containing a combination of estrogen and progestin, and the progestin-only levonorgestrel regimen. Two clinical trials have directly compared the effectiveness of these regimens, the larger of which suggested that the levonorgestrel regimen is more effective than the Yuzpe regimen with effectiveness reported as 89% and 76%, respectively. However, there is growing evidence that the effectiveness of ECs has been overestimated in clinical trials, raising uncertainty about the effectiveness of ECs and the magnitude of the difference between regimens if one exists.

We are using prescription, diagnostic, and reproductive health information from linkage of health databases to compare the effectiveness of the two EC regimens, as well as evaluate the impact of timing of EC administration in a cohort of women who received ECs from pharmacists in British Columbia. Preliminary analysis of ~9,000 ECs suggests that the risk of pregnancy among women in our cohort is 4%. Ongoing evaluation of the data, including the use of multivariate regression modeling, is expected to reveal ~2% reduction of this risk by either regimen. This is the first population-based investigation of clinical outcomes related to ECs in the routine practice setting. The results will contribute to the body of knowledge that informs women and clinicians of optimal EC use.

Impact of Physician Dispensing on Access to Emergency Contraception: A Five Year Follow-Up Study.

Emergency Contraception (EC) is accessed through various health care sources in British Columbia, one of which is general practitioners. While physician prescribing of EC is well recorded, EC dispensing from medical office supplies at no or minimal charge to the patient has not been well documented. An initial 2002 survey of BC physician EC prescribing and dispensing practices estimated the magnitude of physician dispensing from medical office supplies to be nearly three-fold greater than physician prescriptions for the same time period (publication in process). In April 2005, Health Canada changed the regulatory status of an EC agent, Plan B (levonorgestrel), to behind the counter non prescription

availability from pharmacies. The impact of this regulatory change on the clinical practice of physician prescribing and on the dispensing of EC from office supplies is unknown, and further research is required to evaluate the current level of dispensing practice. The purpose of this study is to quantify current EC prescribing and dispensing patterns. The study is ongoing and expected to be complete by next year. Data analysis will determine changes over time in physician patterns of prescribing and dispensing of EC.

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 their continued use to aid in decision making processes in various provinces throughout Canada.

Impact of Physician Dispensing on Access to Emergency Contraception: A Five Year Follow-Up Study.

Herpes Zoster, or shingles, results from reactivation of latent varicella zoster virus (VZV) in the sensory ganglia of adults. The lifetime risk of herpes zoster is about 20-30% and the incidence increases with age. In British Columbia, there was an average of 11,460 new physician visits for herpes zoster per year between 1994 and 2003 (B.C Centre of Disease control data). The incidence was highest among those 65 years of age and older. The most significant symptom of herpes zoster is the associated pain that can persist for several months after the acute phase. Up to one-third of older people with shingles experience pain lasting for 3 months or longer that is commonly referred to as post herpetic neuralgia (PHN). As people age, PHN increases in frequency and severity.

The recent herpes zoster vaccine has been shown to decrease the incidence and severity of herpes zoster in adults, however, the effectiveness of the vaccine decrease with age. Our study combined results observed from a published randomized controlled trial with health resource utilization for treating herpes zoster and related complications in British Columbia, Canada, to evaluate the cost-effectiveness of zoster vaccination outcomes for those over 60 years old. The results of base case analysis suggest that this vaccination strategy is likely cost effective. This is the first analysis to examine the cost-effectiveness of the herpes zoster vaccine in Canada. These results are useful to decision-makers in Canada and other similar jurisdictions.

Mr. Mehdi Najafzadeh

Cost-effectiveness of the Human Papillomavirus Vaccine for Prevention of Cervical Cancer

In Canada, cervical cancer is the second most common cancer in women aged 20 to 44 years. Each year, approximately 1400 women are diagnosed and 400 die from this disease. The primary strategy for preventing cervical cancer is screening of asymptomatic women with the Pap test. Over the past 50 years, this approach has resulted in significant decreases in the incidence and mortality rate. However, in the past decade the rates of cervical cancer have reached a plateau incidence of approximately 7.7 per 100,000 population which has been attributed to decreased compliance with the Pap screening program in those who are less educated or from low socioeconomic status, living in rural or remote areas, and being a recent immigrants, aboriginal, African-American or Hispanic. In addition, since the sensitivity and specificity of the Pap test is not 100%, women can develop cervical cancer despite having a well maintained screening program.

In August 2006, Health Canada approved Gardasil™ (Merck Frosst) for girls and women 9 to 26 years of age for prevention of cervical cancer caused by HPV types 16 and 18. In the Phase II/III clinical trials, this vaccine was shown to have 100% efficacy against the development of CIN 2/3, VIN 2/3, VaIN 2/3 and AIS. A second vaccine against HPV,

Cervarix™ (GlaxoSmithKline), is expected to receive approval in Canada. Given the substantial costs associated with cervical cancer screening programs, the plateau seen with the screening program in developed nations and the costs associated with treatment of precancerous and cancerous cervical lesions in women, public health authorities need to make a decision on whether to publicly fund a school based HPV vaccination program. Thus, policy makers will need information on the epidemiologic and economic impact of different delivery strategies of the vaccine (i.e. age of delivery, vaccination of males and females versus females alone) to determine whether it is good value for money. Therefore, we are evaluating the cost-effectiveness of various HPV vaccination strategies compared to the standard screening program in British Columbia Canada. The project is ongoing but preliminary results suggest that the HPV vaccine is cost-effective compared to the current Pap screening program.

Cost-effectiveness of Combination Therapy for COPD

Little is known on the combination of different classes of medications in chronic obstructive pulmonary disease (COPD). It is hypothesized that drugs with different mechanism of action might have additive or even synergistic effects. The Optimal Therapy of COPD trial (Ann Intern Med 2007;146:545-55) was a multi-center randomized, double-blind, controlled clinical trial (follow-up 52 weeks) designed to compare the effect of treatment for one year of COPD with three treatment regimens: 1) tiotropium and placebo; 2) tiotropium and salmeterol; and 3) tiotropium and fluticasone/salmeterol. We performed a concurrent, prospective economic analysis of the *Optimal* trial as the data on both resource use and effectiveness outcomes were collected during the trial.

Dr. Mohsen Sadatsafavi

Our results indicated that the average patient with COPD in the tiotropium and placebo group generated less direct medical costs compared to tiotropium and salmeterol, and especially tiotropium and fluticasone/salmeterol. At the conventional threshold of $50,000 per QALY, tiotropium and placebo had an 80% probability of being the cost-effective strategy (vs. tiotropium and fluticasone/salmeterol). In conclusion, although patients in the tiotropium and fluticasone/salmeterol arm had an improvement in their quality of life and had fewer hospitalizations than patients treated with tiotropium and placebo, these improvements in health outcomes were associated with increased costs. Thus, neither tiotropium and fluticasone/salmeterol, nor tiotropium and salmeterol are cost-effective alternatives for monotherapy with tiotropium.

An advance pre-publication copy of this paper is currently posted on the journal Thorax's (a highly rated respiratory medicine journal) website and will soon be printed.

"Collaboration with CORE has allowed the completion of a number of innovative and important health outcomes studies especially with regard to economic evaluations."

Dr. Mark Fitzerald

Cost of Asthma in British Columbia

Given that the prevalence of asthma is increasing, a better understanding of health care costs associated with asthma will allow us to estimate the economic burden of this common disease. Therefore, using BC Ministry of Health administrative data (PharmaNet and BC Linked Health Database), we estimated the direct medical costs associated with asthma in BC between 1996 and 2000. This analysis included the costs of hospitalization, emergency department visits, physician visits, and prescription dispensations. Asthma resulted in $41,488,975 (2006 CDN dollars) in annual costs during the study period, or $328 per patient. The major cost component was medications, which accounted for 63.9% of total costs, followed by physician visits (18.3%) and hospitalization (17.8%). We also found that there was a statistically significant increase in annual per patient cost of medications ($p<0.01$) and a decrease in annual per-patient cost of hospitalizations ($p<0.01$) over the study period. In 63.5% of patients, asthma was poorly controlled and this group was responsible for 94% of asthma-related resource utilization. However, these estimates likely underestimate the total cost of asthma in BC because the study focused on patients aged 5-55 and did not include older asthma patients or indirect costs such as time lost from work. This study provides evidence of the potential economic burden of asthma due to lack of control, and suggests that efforts at improving control may decrease overall costs.

The Validity of Generic and Condition-specific Preference-based Instruments: the Ability to Discriminate Asthma Control Status

One goal of asthma treatment is to improve the patient's health-related quality of life. However, it is unclear whether currently available instruments used in cost-effectiveness studies to measure health utilities (i.e. quality of life) can discriminate across asthma control. The objective of this study was to evaluate the validity of generic and condition-specific preference-based instruments, in terms of their ability to distinguish asthma control. 157 asthma patients completed three generic preference-based instruments: the Health Utility Index Mark 3 (HUI-3), the EuroQol (EQ-5D), and the Short Form 6D (SF-6D) and two condition-specific questionnaires: the standardized asthma Quality of Life Questionnaire (AQLQ(S)) and the Asthma Control Questionnaire (ACQ). The AQLQ(S) scores were converted into the condition-specific preference-based scores: the Asthma Quality of Life Utility Index (AQL-5D). We found that the preference-based instruments were generally able to discriminate across specific measures of asthma control such as ACQ scores and the magnitude of asthma medication, but not between levels of self-reported control and severity levels. These instruments also correlated poorly with most control measures ($r = 0.32$-0.37). Significant relationships between AQL-5D scores and all control variables were observed. Overall, the AQL-5D discriminated across all levels of asthma control. Although the HUI-3, EQ-5D, and SF-6D were able to discriminate between the best and worst levels of asthma control, they were not able to discriminate between patients with different levels of moderate control. These results suggest that these instruments may not be ideal for measuring utilities for cost-utility analysis.

"The addition of members of CORE has added a great deal to the research expertise at CHEOS. With CORE, we have one of the largest health economics and outcomes research groups in the country."

Dr. Aslam Anis

Quality of Life in Patients with Tuberculosis

Tuberculosis (TB) is an infectious disease that requires treatment for six months or longer. Many TB drugs are associated with adverse drug reactions (ADRs) that can be bothersome and serious enough to compromise people's quality of life. Health-related quality of life (HRQL), measured by using structured questionnaires, has been accepted as a valuable health outcome in clinical research and practice. HRQL evaluates the individuals' ability to function in daily lives and their own perception of well-being in physical, psychological, and social aspects. Understanding the link between TB, ADRs and quality of life may help improve the efficiency of treatment through reduction in adverse events and increased medication adherence.

Over the last two years, we have conducted several studies assessing HRQL in TB patients. Our research has shown that at baseline, participants with active TB had lower HRQL scores and domains, and had higher depression scores when compared to Latent TB Infection (LBTI) participants. After six months of drug therapy, despite microbiological cure and large improvements in most HRQL domains, active TB participants still had significantly lower HRQL than their LTBI counterparts. The domains most affected were mental health, vitality, physical functioning, social functioning and emotions. Thus, active TB patients have large decrements in HRQL that are not completely rectified by drug treatment. Further studies are ongoing to conduct longitudinal analysis and evaluate recall periods of the structured questionnaires.

Pharmacoepidemiology

Pharmacoepidemiology is defined as the study of the utilization and effects of pharmacotherapeutic agents in large numbers of people; this discipline borrows from both therapeutics and epidemiology. Epidemiological methods are applied to pharmacotherapeutic issues such that descriptive and analytic studies (both observational and experimental) are conducted. At CORE, we primarily conduct pharmacoepidemiological evaluations using large, population-based databases. Using these sources of data, we conduct studies to evaluate risks and benefits of drug therapy experienced with the "real world" use of drugs. Using state of the art methods and sophisticated techniques and computing, CORE has conducted several of these studies on cutting edge issues.

Is the Use of Antibiotics in the First Year of Life Associated with Development of Asthma?

Asthma is the most common chronic disease of childhood with almost one in eight school age children being affected and about 10% of children (compared with 5% of adults) take medication for asthma. Numerous studies performed in different countries and varying populations over the last 30 years have indicated that the prevalence of asthma has increased significantly. Antibiotics are commonly used to treat infections during early childhood and their use has increased significantly . Given that this increase in antibiotic use has been accompanied by an increase in the prevalence of asthma, scientists have hypothesized that a causal association exists.

Although a number of studies have evaluated this association, the epidemiologic evidence is conflicting. Using a large population-based database, we conducted a study to explore the association between receipt of antibiotics in the first year of life and the subsequent development of asthma. This study has just been completed and our findings suggest an association between antibiotic use and development of asthma; this association is stronger with the increased number of antibiotics administered to children.

Genetics

Mental Retardation is a life-long disorder that has a major impact not only on the affected individual but also on his/her family and society. Children with mental retardation take longer to learn how to speak, walk, or attend to their personal needs and have trouble learning in school. While there are many possible explanations why a person has mental retardation, the cause is often a genetic condition, a problem during pregnancy or at birth, or childhood disease. When a paediatrician suspects a child has mental retardation, the individual is referred to a genetics clinic to search for possible genetic causes. The immediate outcome of establishing an etiologic diagnosis is information. Information on etiology results in more accurate prognosis, the development of specialised programmes, and availability of prenatal diagnosis. There are several tests to diagnose genetic causes of mental retardation. As such, we have conducted several studies to determine their cost-effectiveness.

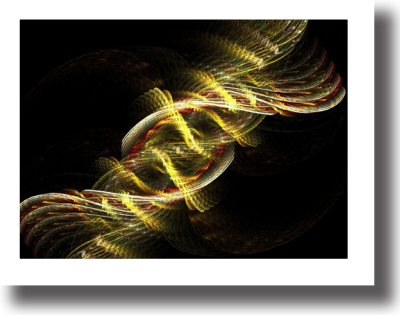
Genomic Tools for the Diagnosis and Evaluation of Mental Retardation

The standard cytogenetic test is a karyotype, which has a resolution of at least 5 million base pairs (5 Mb) and can identify a genetic cause of mental retardation in approximately 10% of tested individuals. For approximately one-third to one-half of all children with mental retardation, however, the cause will remain idiopathic. A recent advancement in cytogenetic testing, called array genomic hybridization (AGH), uses the entire genome to identify chromosomal imbalances that are very small (<5-10 Mb) and can establish an etiologic diagnoses in approximately twice as many children. Improved resolution, however, comes with a higher monetary costs—per test. AGH costs around $1,000 more than standard cytogenetic tests.

This project was structured around a health technology assessment that investigated the costs, benefit, and net-benefit of implementing AGH as an alternative to standard care. Costs were measured from the Canadian health care payer perspective and benefit was quantified using a stated preference discrete choice experiment (DCE). The DCE elicited preferences from two populations: society, and families of children with mental retardation. From a methodological perspective, the project explored i) Bayesian approaches to the design and estimation of discrete choice experiments, ii) the feasibility of incorporating willingness to pay values derived from a DCE into a decision-analytic model to measure net-benefit; and iii) the use of probabilistic sensitivity analysis to develop a net-benefit curve. A Bayesian approach to experimental design incorporates prior information on consumer preferences to construct a questionnaire aimed at maximizing the amount of information obtained from participants. The Bayesian estimation techniques employed (called hierarchical Bayes; HB) used Markov Chain Monte Carlo (MCMC) methods to estimate the mixed logit (MXL) behavioural model. Within the health economics literature, neither Bayesian design nor HB techniques have been investigated, and there are no published studies characterizing both the costs and benefit (measured in willingness to pay from a DCE) of a health technology into a single, comprehensive framework using decision-analytic methods.

The AGH testing strategy resulted in an additional 10.6 children in 100 (95% CI 0.05-0.17) receiving a genetic diagnosis of mental retardation. The incremental cost of implementing AGH was $977 (95% CI 644-1356). From a societal perspective, under the current cost of AGH testing, AGH testing is not expected to be cost beneficial; the price point at which AGH was cost beneficial was $1,100. From the perspective of families of children with MR, the mean incremental willingness to pay (WTP) was $1,411 (95% CI -1,459 to 4,902). The mean net benefit using these WTP from families was estimated to be $446 (95% CI -2,473 to 3,861), meaning that adopting AGH would be cost beneficial and should be implemented.

This study demonstrated that WTP estimates from a DCE can be directly incorporated into a decision-analytic model to estimate net-benefit. The policy recommendations differ depending on the population used to value WTP. From a societal perspective, the value of AGH at its current price is not expected to result in a more efficient allocation of resources. When families of children with mental retardation are used in the CBA, the decision is reversed and supports an assertion that AGH should be funded for use in the Canadian health system.



DNA

Graduate Students

Post-doctoral Fellows

Dr. Kelly Grindrod

Under the supervision of Drs. Carlo Marra and Larry Lynd, Kelly joined CORE as a Post-doctoral Fellow in May 2007. In addition, she is also undertaking a M.Sc within the UBC Faculty of Pharmaceutical Sciences. While Kelly is involved in a variety of research projects within the organization, as a practicing community pharmacist, her focus is on potential remuneration systems for community-based clinical pharmacy services. Kelly's current projects include assessing pharmacist preferences for different aspects of potential remuneration systems, and participating in the development of a pilot project of clinical services for chronic disease management in British Columbia. Kelly has received fellowship trainee awards from both the Michael Smith Foundation for Health Research and the Canadian Institutes of Health Research to support her projects.

"Despite much focus on chronic disease management in primary care, community pharmacists remain relatively uninvolved in preventive care and medication management. One of the barriers is the lack of a remuneration system for clinical services which limits pharmacy resources that are available for patient care outside of dispensing services. Our goal is to explore the preferences of key stakeholders for clinical pharmacy services in the community.

One of the greatest benefits of working with CORE on projects is the diversity of expertise available, and the experience of both my colleagues and supervisors."

Dr. Kelly Grindrod

Doctor of Philosophy

Mr. John C. Woolcott

John joined CORE as a PhD student 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 has received fellowship trainee awards from both the Michael Smith Foundation for Health Research and the Canadian Institutes of Health Research to support his projects.

"My involvement with CORE has provided me access to a wide breadth of expertise and mentorship from my colleagues and supervisors. Due in large part to these valuable resources, I've received fellowship trainee awards from both the Michael Smith Foundation for Health Research and the Canadian Institutes of Health Research to support my research."

Mr. John Woolcott

Mr. Dean Regier

Dean Regier

Dean holds a Bachelor of Arts in Business Economics (BA, High Honors) from the University of Saskatchewan (Saskatoon, Canada), and a Master of Arts (MA) in Economics from Carleton University (Ottawa, Canada). He currently is a PhD student at the Health Economics Research Unit at the University of Aberdeen (Aberdeen, Scotland). Dean is being supervised by Professor Mandy Ryan (University of Aberdeen) and Dr. Carlo Marra (University of British Columbia). Dean's interests and doctoral research is in Bayesian approaches to the design and estimation of discrete choice experiments. This methodological research is structured around a novel genetic technology to identify idiopathic developmental delay. Dean has received doctoral awards from the Canadian Institutes of Health Research (Doctoral Research Award) and the University of Aberdeen (6th Century Studentship) whereas his research project was funded by a Genome Canada contract.

Mr. Mehdi Najafzadeh

Mehdi Najafzadeh

Mehdi is a PhD student supervised by Dr. Carlo Marra and Larry Lynd. He is also a health economist for the CORE and his research area is health outcomes evaluation and health economics. In addition to his MA 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 MSc 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.

Ms. Jennifer Faddegon (nee Davis)

Jennifer Faddegon

Jennifer commenced her PhD studies within the Faculty of Health Care and Epidemiology at UBC in September 2006. Her co-supervisors include Drs. Aslam Anis, 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 Guo

Na started her PhD studies in the 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 the University of Alberta. Na's doctoral research will be in the area of tuberculosis. She will be determining the impact of the recall persiod associated with two standardized Health-related Quality of Life (HRQoL) questionnaires in patients who have active tuberculosis. 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.

Ms. Camila Guimaraes

Camila Guimaraes

Camila is a PhD candidate at the University of Sao Paulo in Brazil, and a visiting student at the University of British Columbia. As part of her PhD program, she has joined CORE to conduct her thesis focusing on assessing patients' preferences in diabetes treatment. Prior to starting her PhD, Camila earned her Pharmacy degree from the Univeristy of Mato Grosso do Sul in Brazil in 2003. She then worked as a pharmacist at the University of Ribeirao Preto (UNAERP) in 2004, and completed her Master's degree from the University of Sao Paulo in 2006.

Masters of Science (MSc) Students

Dr. Vivian W.Y. Leung

Vivian is a Board Certified Pharmacotherapy Specialist. She completed a Hospital Pharmacy Residency at Vancouver General Hospital in 2002 and received the Doctor of Pharmacy degree from the University of British Columbia in 2006. As a graduate student, Dr. Leung has undertaken coursework at UBC and McGill University, and is focusing her Master's thesis on population health. Vivian's supervisor is Dr. Marc Levine and she will be conducting a population-based comparison of two regimens for Emergency Contraception. Vivian has received a trainee award from the Michael Smith Foundation for Health Research to support her project.

Vivian Leung

Ms. Bridgette Oteng

Bridgette Oteng

Bridgette works with the UBC Collaboration for Outcomes Research and Evaluation (CORE) team as a Researcher while also pursuing her graduate degree in health outcomes evaluation under Drs. Carlo Marra and Fawziah Marra's supervision. Bridgette is from Ghana and completed her Bachelor's degree from Dalhousie University, Halifax NS, majoring in both Biochemistry and Economics. Bridgette's thesis work involves a discrete choice experiment for the Human Papilloma Virus vaccination. Her research interests also include performing outcome and economic evaluations on genetic related diseases.

Ms. Katie Sweeney

Katie joins CORE as a Master's Student under Dr. Larry Lynd's supervision. 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. For her Masters, Katie will be focusing on health outcomes evaluation and health-related quality of life in patients with asthma.

Katie Sweeney

Ms. Belinda Chen

Belinda Chen

Belinda graduated from UBC majoring in Cell Biology and Genetics. While taking course work this past year as part of her qualifying year for her MSc with the Faculty of Pharmaceutical Sciences at UBC, she has been working on a project with Dr. Larry Lynd involving drug risk-benefit tradeoffs. Her main area of research interest is pharmacoepidemiology, and she will begin her MSc full-time under Dr. Lynd's supervision in the fall of 2008

Publications and Presentations

Selected Peer-Reviewed Publications

Bansback N, Maetzel A, Drummond M, Anis A, Marra C, Conway P, Boers M, Tugwell P, Boonen A. Considerations and preliminary proposals for defining a reference case for economic evaluations in ankylosing spondylitis. J Rheumatol 2007 May;24(5):1178.

Bansback N, Marra C, Tsuchiya A, Anis A, Guh D, Hammond A, Brazier J. Using The Health Assessment Questionnaire To Estimate Preference-Based Single Indices In Patients With Rheumatoid Arthritis. Arthritis Rheum 2007 Jul 30;57(6):963-971.

Lynd LD, Goeree R, Crowther M, O'Brien BJ. A probabilistic cost-effectiveness analysis of enoxaparin versus unfractionated heparin for the prophylaxis of deep vein thrombosis following major trauma. Can J Clin Pharmacol. 2007 Summer;14(2):e215-26.

Marra C, Cibere J, Tsuyuki RT, Soon JA, Esdaile JM, Gastonguay L, Oteng B, Embley P, Colley L, Enenajor G. Improving osteoarthritis detection in the community: the pharmacist identification of new, diagnostically confirmed osteoarthritis (PHIND-OA). Arthritis and Rheum 2007 Oct;57(7):1238-44.

Marra C, Marion SA, Guh DP, Najafzadeh M, Wolfe F, Esdaile JM, Clarke AE, Gignac MA, Anis AH. Not all "quality-adjusted life years" are equal. Journal of Clinical Epidemiology 2007 Jun;60(6):616-24.

Marra F, McNeil S. Changing attitudes towards vaccination. Canadian Pharmacists Journal 2007;140 (suppl 2):S8.

Marra F, Monnet DL, Patrick DM, Chong M, Brandt CT, Winters M, Kaltoft MS, Tyrrell GJ, Lovgren M, Bowie WR. A comparison of antibiotic use in children between Canada and Denmark. Annals of Pharmacotherapy 2007;41:659-656.

Marra F, Bruchet N, Richardson K, Moadebi,S, Elwood RK, FitzGerald JM, Marra C. Adverse reactions associated with first-line anti-tuberculosis medications. International Journal of Tuberculosis and Lung Disease 2007 Aug;11(8):868-75.

McNeil S, Pelly L, Gemmill I, Halperin B, Marra F. Core competencies for immunization providers in Canada: a multidisciplinary priority. Canadian Pharmacists Journal 2007;140 (suppl 2):S19.

Moadebi S, Harder C, Elwood RK, Fitzgerald JM Marra F. Fluoroquinolones for the treatment of pulmonary tuberculosis: a systematic review. Drugs 2007;67(14):2077-2099.

Mulgrew AT, Ryan CF, Fleetham JA, Cheema R, Fox N, Koehoorn M, Fitzgerald JM, Marra C, Ayas NT. The impact of obstructive sleep apnea and daytime sleepiness on work limitation. Sleep Med 2007 Sep 5.

Ogilvie GS, Remple VP, Marra F, McNeil SA, Naus M, Pielak KL, Ehlen TG, Dobson SR, Money DM, Patrick DM. Parental intention to vaccinate daughters with the HPV vaccine. CMAJ 2007;177:1506-1512.

Regier D, Marra C, Lynd LD. Economic evaluations of anticoagulants for the prophylaxis of venous thromboembolism following major trauma. Expert Review of Pharmacoeconomics and Outcomes Research 2007;7(4): 403-13.

Regier DA, Bansback N Dar Santos A, Marra C. An overview of cost effectiveness analyses of tumor necrosis factor alpha antagonists in rheumatoid arthritis, psoriatic arthritis, and ankylosing spondylitis. Expert Review of Pharmacoeconomics & Outcomes Research 2007; 7:155-67.

Reynolds J, Shojania K, Marra C. Abatacept: A novel treatment for moderate to severe rheumatoid arthritis. Pharmacotherapy 2007 Dec;27(12):1693-701.

Rowely A, Resman-Targoff BH, Marra C, Pucino F. The evolution of clinical pharmacy in the practice of rheumatology. The Annals of Pharmacotherapy 2007 Oct;41(10):1705-7.

Sawatzky R, Liu-Ambrose T, Miller WC, Marra C. Physical activity as a mediator of the impact of chronic conditions on quality of life in older adults. Health Qual Life Outcomes 2007 Dec 19;5(1):68.

Shalansky S, Jang L, Ignaszewski A, Clark C, Jung L, Marra C. Accuracy of a prescription claims database for medication reconciliation for outpatients with heart failure. Can J Hosp Pharm June 2007;60(3):169-76.

Shalansky S, Lynd LD, Richardson K, Ignaszewski A, Kerr C. Risk of warfarin-related bleeding events and supratherapeutic international normalized ratios associated with complementary and alternative medicine: a longitudinal analysis. Pharmacotherapy. 2007 Sep;27(9):1237-47.

Shoveller J, Chabot C, Soon JA, Levine M. Identifying barriers to emergency contraception use in young women from various ethno-cultural groups in British Columbia, Canada. Perspect Sex Reprod Health. 2007;39(1):13-20.

Skowronski DM, Li Y, Tweed A, Tam T, Petric M, David ST, Marra F, Bastien N, Lee SW, Krajden M, Brunham RC. Protective measures and human antibody response during an avian influenza H7N3 outbreak in poultry in British Columbia, Canada. CMAJ 2007;176:47-53.

Soon JA, Meckley LM, Levine M, Marciante KD, Fielding DW, Ensom MHH. Modelling costs and outcomes of expanded availability of emergency contraceptive use in British Columbia. Can J Clin Pharmacol 2007;14(3):e326-e338.

Selected Presentations

Lynd LD. Case studies using incremental net benefit for risk-benefit analysis. At: Joint FDA, PhRMA, BIO working conference: Assessing drug benefits and risks in regulatory decisions: framed the need, evaluating the tools, and deciding next steps. Washington, DC. November 7 & 8 , 2007.

Lynd LD. Using incremental net benefit for quantitative benefit-risk analysis – case studies of Vioxx® and Lotronex®. At: Office of Health Economics/ European Medicines Evaluation Agency Workshop: "How can regulatory agencies improve the risk-benefit assessment of pharmaceuticals? Does an economic perspective help? London, England. October 24, 2007.

Lynd LD. Using incremental net-benefit for quantitative risk-benefit analysis. Presented at: Drug Information Association 43rd Annual Meeting, June 18, 2007. Atlanta, GA.

Lynd LD. Pharmaceutical reimbursement policies for drug therapy for children with asthma in British Columbia, in: Public Health, Policy and Soceity Workshop on Improving Drug Benefits for Children with Asthma: Building a Research Agenda. March 27 – 28, 2007. Toronto. ON. (Presenter and Panelist).

Lynd LD. Quantitative methods for therapeutic benefit risk assessment. FDA/Regenstrief Institute joint meeting on Benefits and Risks of Pharmaceuticals: Frameworks, Methods and Policies. March 15-15, 2007, Washington, DC. (Presenter and Panelist)

Marra CA. Cost-effectiveness of diagnostic strategies for H.pylori. BCCDC Nov 2007.

Marra CA. Session Chair, Pharmacy Practice Research, Canadian Pharmacist's Association Annual Meeting, Ottawa, June 2007.

Marra CA. How can pharmacists help with the care gap in osteoarthritis? Vancouver General Hospital Family Practice Rounds, Diamond Health Centre, March 2007

Marra CA. The economics of predicting response to lymphoma treatments. Follicular Lymphoma SAB Presentation, Canada's Michael Smith Genome Sciences Centre, February 2007.

Marra CA. Pharmacoeconomics and drug policy decision-making in Canada: A primer for pharmacists. (full day event), February 3, 2007. Continuing Pharmacy Professional Development Workshop, Wall Centre, Vancouver, B.C

Marra CA. Results of the PhIND-OA study. CoMPRiS/EPICORE Centre, University of Alberta, Edmonton, Alberta, January 2007.

Marra F, Mak S, Chong M, Patrick D. Determinants of regional variation in outpatient antibiotic consumption in British Columbia. Association of Medical Microbiology and Infectious Disease (AMMI) Canada, Vancouver, British Columbia, February 27 - March 1, 2008. (Podium Presentation)

Marra F, Chong M, Dhami S, Petric M, Patrick DM, Brunham RC. Monitoring over-the-counter medication sales for early detection of influenza. 47th Interscience Conference Antimicrobial Agents Chemotherapy, Chicago, Illinois, September 17 – 20, 2007. (Podium Presentation)

Soon J. Young women's perspectives on accessing and using emergency contraception in Vancouver, Canada World Conference on Health Promotion and Health Education. Vancouver, BC. June 11, 2007.

Soon J. Dispensing of emergency contraceptives by general practitioners in BC. 4th Canadian Therapeutics Congress. Halifax, NS.

Soon J. Outcomes evaluation of emergency contraception: A multi-methods program of research. Faculty of Medicine Community Health Sciences Colloquium, University of Manitoba. Winnipeg, Manitoba. April 13, 2007.

Soon J. Canadian experience with emergency contraception: A prime example for adolescent studies during a workshop on the challenges in studying the adolescent population: what can be done to improve adolescent health at the American Society of Clinical Pharmacology and Therapeutics 2007 Annual Meeting in Anaheim, CA on March 22, 2007.

Selected Abstracts

Lynd LD, Marra CA. Development of an undergraduate course and 1-day workshop on health technology assessment. 2007 Canadian Agency for Drugs and Technologies in Health Symposium. April 23 – 24, 2007. Ottawa, ON.

Lynd LD, Colley. L, Najafzedeh M, Sculpher MJ, Willan AR, Johnson RF, Ozdemir S. Quantitative risk-benefit analysis of alosetron in irritable bowel syndrome: a patient-level meta-cohort analysis. 23rd International Conference on Pharmacoepidemiology and Therapeutic Risk Management. Quebec City, QC. August 19-22, 2007.

Marra CA. Predicting EQ5D from St. George's Respiratory Questionnaire International Society of Pharmacoeconomics and Outcomes Research (ISPOR), Annual European Meeting, Dublin, Ireland, October 20-23, 2007.

Marra CA, Lynd LD, Bansback N, Guh D, Anis AH. Predicting preference-based measures from the HAQ-DI and the RAQoL. European League Against Rheumatism Annual European Congress of Rheumatology. Barcelona, Spain, June 13-16, 2007.

Marra CA, Kopec J, Colley L, Sayre E, Oteng B, Gastonguay L, Esdaile J. Validity of a new adaptive quality of life measure in knee OA. European League Against Rheumatism Annual European Congress of Rheumatology. Barcelona, Spain, June 13-16, 2007.

Marra CA, Marra F, Richardson K, Lynd LD, Kozyrskyj AL, Patrick D, Bowie WR, Fitzgerald JM. Antibiotic exposure during infancy leads to increase risk of asthma: a population based analysis. 4th Canadian Therapeutics Congress, Halifax, NS, May 27 – 30, 2007.

Marra CA, Sadatsafavi M, Marra F, Elwood RK, FitzGerald JM. Cost-effectiveness of QuantiFERON-TB gold (QFG) in the screening of close contacts. American Thoracic Society, San Francisco, California, May 18 - 24, 2007.

Marra CA, Lynd LD, Bansback N, Guh D, Anis AH. Predicting preference-based measures from the HAQ-DI and the RAQoL. European League Against Rheumatism Annual European Congress of Rheumatology. Barcelona, Spain, June 13-16, 2007.

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Marra F, Gunther O, Ogilvie G, Marra CA, Pourbohloul B, Ehlen T, Miller D, Naus M, Patrick DM, Brunham RC. A dynamic model to determine cost effectiveness of HPV vaccine in girls and boys in Canada. ISSTDR, Seattle, Washington, July 29th – August 1st, 2007.

Marra F, Marra CA, Richardson K, Lynd L, Patrick DM, Bowie WR, FitzGerald JM. Does Antibiotic Exposure During Infancy Lead to Development of Asthma? A Population-Based Analysis. American Thoracic Society, San Francisco, California, May 18 - 24, 2007.

Marra F, Marra CA, Sadatsafavi M, Elwood RK, FitzGerald JM. QuantiFERON-TB Gold (QFG) in the screening of close contacts. 11th Annual Meeting of the IUATLD, Vancouver, BC, February 22-24, 2007.

Patrick D, Marra F, Blondel-Hill E, Tyrell G, Kendall P, Dobson S, Thomas E, Purych D, Bowie B, Henry B, David S, Chambers C, Winters M, Vrbova L, Dreher K. Top three evidence-based strategies to limit your resistance footprint. Association of Medical Microbiology and Infectious Disease (AMMI) Canada, Vancouver, British Columbia, February 27 - March 1, 2008.

Regier DA, Ryan M, Phimister E, Marra CA. Accounting for preference heterogeneity in discrete choice experiments using hierarchical Bayes. iHEA 6th World Congress: Explorations in Health. Copenhagen, Denmark, July 8-11, 2007.

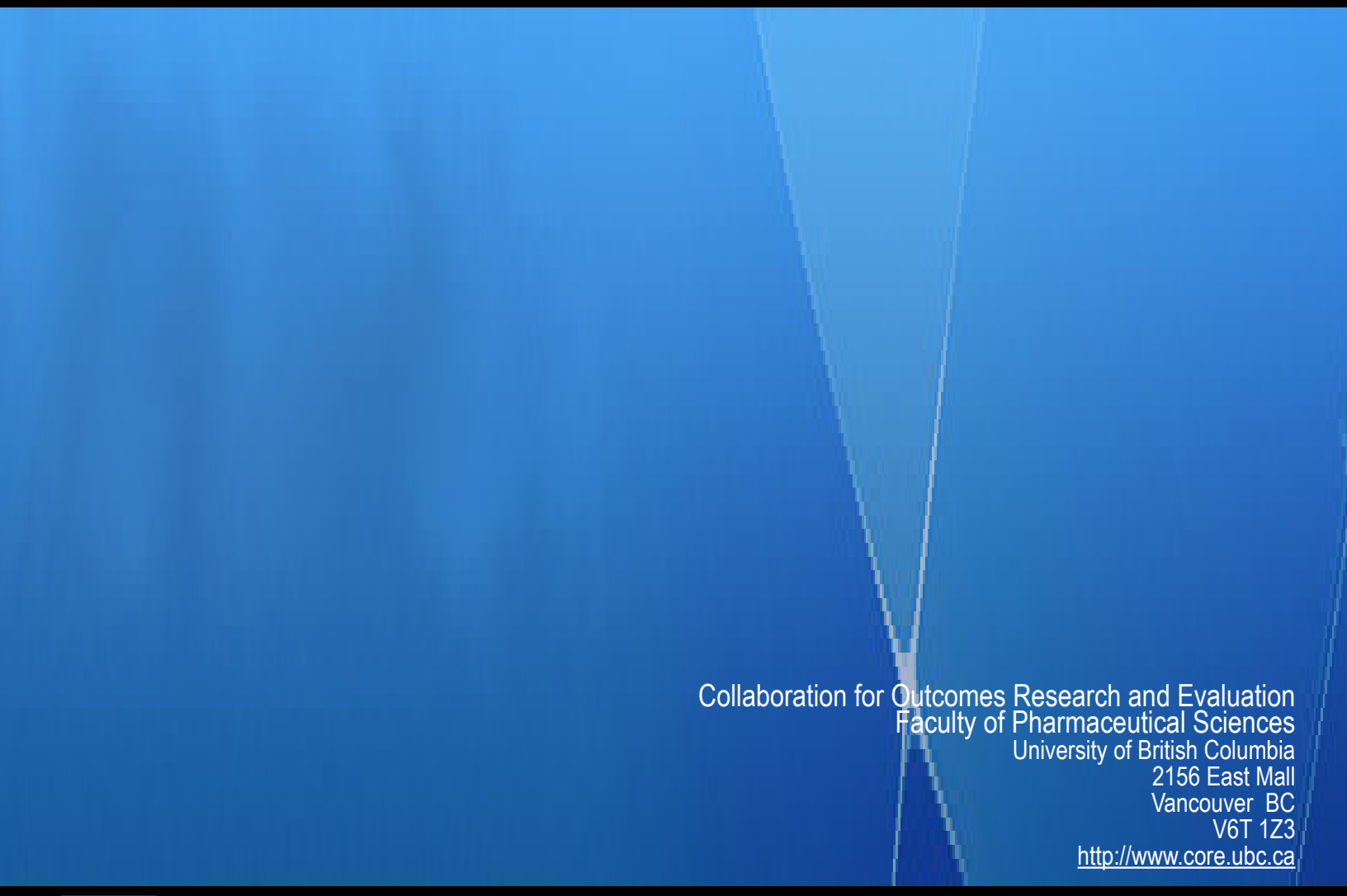
Regier DA, Ryan M, Phimister E, Marra CA. Heterogeneous design for discrete choice experiments using prior beliefs. iHEA 6th World Congress: Explorations in Health. Copenhagen, Denmark, July 8-11, 2007.

Skowronski DM, Brown E, Chong M, Marra F, Petric M, Aoki F, Babiuk L. Pre-exposure oseltamivir prophylaxis permits protective antibody response to influenza virus, 2007 Options for the Control of Influenza VI (Options) Conference, Toronto, Ontario, June 17-23, 2007.

Woolcott JC, Richardson KR, Patel B, Morin J, Marra CA. A meta-analysis of the impact of medications on falling in the elderly. 4th Canadian Therapeutics Congress, Halifax, NS, May 27 – 30, 2007.

Woolcott JC, Lynd LD, Koehoorn M, Marra CA. An assessment of the construct validity of the Health Utilities Index Mark 3 in asthmatics using the population based Canadian Community Health Survey Cycle 3.1. 4th Canadian Therapeutics Congress, Halifax, NS, May 27 – 30, 2007.

Regier DA, Ryan M, Marra CA. The development of an incremental willingness to pay curve derived from a discrete choice experiment. International Society of Pharmacoeconomics and Outcomes Research (ISPOR), Annual European Meeting, Dublin, Ireland, October 20-23, 2007. Best Student Presentation Award.



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