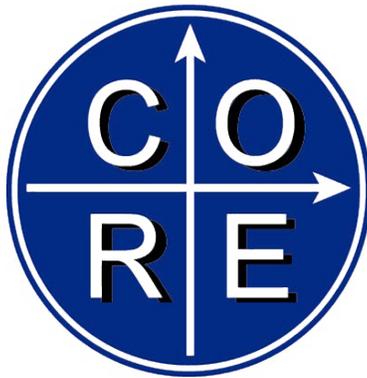




THE UNIVERSITY OF BRITISH COLUMBIA  
**PHARMACEUTICAL  
SCIENCES**

## 2010 Annual Report



Collaboration for  
Outcomes  
Research and  
Evaluation



a place of mind

# 2010 Annual Report



Collaboration for  
Outcomes  
Research and  
Evaluation

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## A Word from the Director of CORE



We are pleased to issue our fourth annual report for the Collaboration for Outcomes Research and Evaluation (CORE) located within the Faculty of Pharmaceutical Sciences at the University of British Columbia and the Centre for Health Evaluation and Outcome Sciences (CHEOS) at the Providence Health Care Research Institute.

Over this past year, CORE has continued to evolve and develop. Investigators from CORE published twenty-eight peer-reviewed papers in high caliber journals such as the Lancet, the Archives of Internal Medicine, and the American Journal of Human Genetics to name a few. We were fortunate to continue to attract peer-reviewed funding from very competitive sources and have recently finished a number of high impact projects including our evaluation of pharmacist surveillance for drug safety from a grant provided through the Drug Safety and Effectiveness Network (DSEN), Health Canada/CIHR.

CORE members continued to teach pharmacotherapeutics, health policy and health economics to undergraduate pharmacy students, and continued providing the Critical Evaluation of the Pharmacotherapy Literature to Doctor of Pharmacy students. In addition, CORE members collaborated with individuals from the Centre for Clinical Epidemiology and Evaluation and CHEOS to deliver an intensive two day workshop on health technology assessment and economic evaluation. This workshop was well received and, as such, another advanced workshop is currently being planned for next year (please check our website at [www.core.ubc.ca](http://www.core.ubc.ca) for further details).

We were very fortunate to have a number of highly qualified personnel join our team with Ms. Faye Pedersen as administrator, Dr. Ifan Kuo as a MSc/postdoctoral fellow, Dr. Pierrick Bedouch as a postdoctoral fellow, Ms. Jamie Thomas as a researcher, Mr. Ryan Maltais as a MSc student, and Ms. Lilla Roy as an MSc student. We had a number of students who successfully defended and/or completed their programs – Dr. Na Guo (PhD – now a postdoctoral fellow at PATH at McMaster University), Dr. Kelly Grindrod (Fellow – now an Assistant Professor at the University of Waterloo), Dr. Jen Faddegon (PhD – now a postdoctoral fellow at the Centre for Clinical Epidemiology and Evaluation), Ms. Katie Sweeney (MSc – now a sales representative for a medical/dental device at Hayes Handpiece in Vancouver, BC), and Ms. Belinda Chan (MSc).

Many of our students are putting their final touches on their theses and are getting ready to defend in the summer and early fall. These include Dr. Mohsen Sadatsafavi and Mr. Mehdi Najafzadeh.

In summary, this year was another successful one for CORE and affiliates and we are looking forward to even more successes and growth in 2011.

Respectfully submitted,



Carlo Marra, BSc(Pharm), PharmD,  
Associate Professor, Faculty of Pharmaceutical Sciences, University of British Columbia  
Director, Collaboration for Outcomes Research and Evaluation  
Scientist, Providence Health Research Institute

## A Word from UBC

### *Greetings from the Dean, Faculty of Pharmaceutical Sciences, University of British Columbia*



On behalf of the University of British Columbia Faculty of Pharmaceutical Sciences, greetings to the latest edition of the Annual Report of CORE, the Collaboration for Outcomes Research and Evaluation. CORE has effectively blended 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 readily translates to improved drug therapy and better health outcomes. Since its founding in 2000 in the Faculty of Pharmaceutical Sciences at The University of British Columbia (UBC), we have witnessed exponential growth in the cadre of researchers, the breath of expertise, the impact of their research, and the supportive environment in which CORE functions. CORE is committed to minimize risk and maximize the clinical benefits, quality of life benefits, and economic benefits of drug therapy.

This Annual Report summarizes the remarkable accomplishments of CORE's researchers during the academic year 2010. As you read this report, you will note highlights of CORE's many strengths; the quality of their people, the significance of their funding, the impact and influence of their research. 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 greet you to the latest edition of the Annual Report of CORE and thank you for your continued 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, Collaboration for Outcomes Research and Evaluation (CORE)

Associate Professor, Faculty of Pharmaceutical Sciences, University of British Columbia

Scientist, Centre for Health Evaluation and Outcome Sciences (CHEOS), Providence Health Research Institute

Scientist, Arthritis Research Centre of Canada

**Larry D. Lynd** BSP, PhD

Associate Director, Collaboration for Outcomes Research and Evaluation (CORE)

Associate Professor, Faculty of Pharmaceutical Sciences, University of British Columbia

Scientist, Centre for Health Evaluation and Outcome Sciences (CHEOS), Providence Health Care Research Institute

### Associates

**Judith A. Soon** BSc(Pharm), RPh, ACPR, MSc, Dipl (Epidemol & Biostat), PhD, FCSHP

Assistant Professor, Faculty of Pharmaceutical Sciences, University of British Columbia

**Marc Levine** BSc, BSc(Pharm), PhD

Professor, Faculty of Pharmaceutical Sciences, University of British Columbia

**Aslam Anis** PhD

Director, Centre for Health Evaluation and Outcome Sciences

Director, Masters of Health Administration Program (MHA)

Professor, School of Population and Public Health, University of British Columbia

**Janusz Kaczorowski** BA, MA, PhD

Director of Primary Care and Community Research, Child & Family Research Institute, MSFHR Senior Scholar

Professor and Research Director, Department of Family Practice, University of British Columbia

**Jeff Johnson** BSP, PhD

Professor and Canada Research Chair, School of Public Health, University of Alberta

Chair, Alliance for Canadian Health Outcomes Research in Diabetes (ACHORD)

**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

Principal Investigator - Centre for Hip Health and Mobility (Theme Co-Leader-Hip Fracture Prevention)

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

Scientist, Centre for Clinical Epidemiology and Evaluation, Vancouver Coastal Health Research Institute

Professor, Faculty of Medicine, University of British Columbia

Head, Division of Respiratory Medicine, Faculty of Medicine, University of British Columbia

Director, Centre for Lung Health

**Natalie Henrich** BA, PhD, MPH

Research Scientist, Centre for Health Evaluation and Outcome Sciences, Providence Health Care Research Institute

### Associates - continued

**Ross Tsuyuki** BSc(Pharm), PharmD, MSc, FCSHP, FACC  
Director, Epidemiology Coordinating and Research Centre (EPICORE)  
Director, Centre for Community Pharmacy Research and Interdisciplinary Strategies (COMPRIS)  
Professor of Medicine, Division of Cardiology, University of Alberta

**Steve Morgan** BA(Hons), MA, PhD  
Associate Professor, School of Population and Public Health, University of British Columbia  
Associate Director, Centre for Health Services and Policy Research (CHSPR), University of British Columbia

### Research Staff

**Adam Raymakers** BSc, MSc  
Health Economist

**Jamie Thomas** BSc  
Researcher

**Lindsey Colley** BSc, MSc  
Statistician

**Maja Grubisic** BSc, MSc, AStat  
Statistician

### Administration

**Faye Pedersen**  
Research Administrator

**Salma Lalji**  
Developer

### Students and Post-docs

**John Woolcott** BA, MA  
PhD student

**Natalie McCormick** BSc  
MSc student

**Mehdi Najafzadeh** BSc, MSc, MA  
PhD student

**Ryan Maltais** BSc(Pharm)  
MSc student

**Mohsen Sadatsafavi** MD, MHSc  
PhD student

**Lilla Roy, R.N.** BScN  
MSc student

**Pierrick Bedouch** PharmD, PhD  
Postdoctoral fellow

**I fan Kuo** BSc(Pharm), PharmD

## About CORE

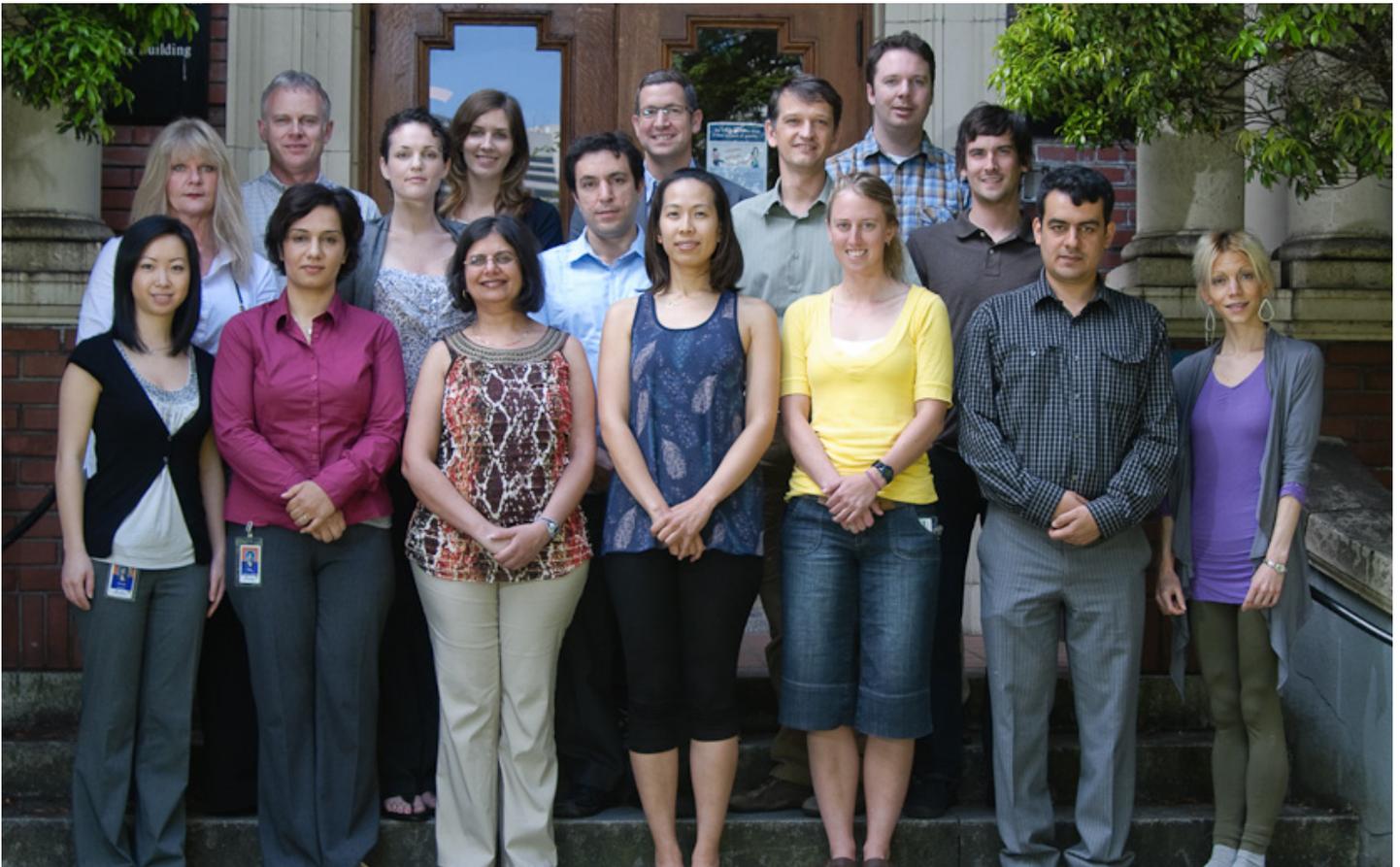


The University of British Columbia's Collaboration for Outcomes Research and Evaluation (CORE) group addresses the need for clinical and economic research and education in pharmaceutical outcomes assessment. The CORE team is a multidisciplinary group of researchers with expertise in clinical pharmacy,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



## Research in Progress

### 1. Cost-Effectiveness Analysis for Cognitive Behavioural Therapy for Depression

Mental health problems present a substantial burden of illness on the Canadian population. Thus, identifying, evaluating, and implementing new treatment strategies for the management of psychiatric disorders is integral to reducing this burden of disease. The objectives of this analysis were to develop a decision analytic model to compare the treatment of the pharmacologic management of depression with cognitive behavioural therapy (CBT).

We developed a decision analytic model comparing pharmacotherapy to CBT for the treatment of depression over a two year time horizon from both the perspective of the health care system and the societal perspective. All model parameters (costs, probabilities, and utilities) are extracted from the literature including previously published studies comparing pharmacotherapy to another alternative treatment strategy, CBT to another alternative treatment strategy, from head-to-head trials, or from previously published economic analyses.

Results of our analysis show that over a two year period, CBT was cost-saving despite the higher cost of treatment itself. In terms of benefits, accounting for quality of life, CBT results in a positive gain compared with pharmacotherapy. As such, CBT provides positive health gain while saving money for our health care system. Extrapolating the results to the provincial population, even treating a fraction of patients suffering from depression with CBT could result in significant overall improvement in health in British Columbia.

### 2. The Feasibility of Using Community Pharmacists in Focused Surveillance for Drug Safety and Effectiveness: A Case Study of Anti-Hypertensives in Pregnancy

Hypertensive disorders of pregnancy are associated with serious complications that affect 7-10% of pregnancies. Although treatment for severe hypertension is well defined, there is still no consensus on treatment for non-severe hypertension both in terms of the blood pressure at which to start treatment as well as target blood pressure to maintain. Further, many anti-hypertensive drugs are contraindicated for pregnancy and clinical trials to date have failed to clarify the relative maternal and perinatal risks and benefits of anti-hypertensive therapy for non-severe hypertension.

The lack of consensus regarding non-severe hypertension thresholds and targets as well as the variability in anti-hypertensive therapy choices leaves the maternal and perinatal populations affected by hypertensive disorders of pregnancy open to wide variability in care. This variability in care needs to be monitored and linked with perinatal outcomes.

Community pharmacies provide an ideal setting to initiate a surveillance strategy to monitor anti-hypertensive prescription use for women during pregnancy and while breastfeeding. In this feasibility trial, community pharmacists are recruiting pregnant and breastfeeding women in their pharmacies and providing enhanced care including blood pressure measurement, adverse drug reaction reporting, monitoring appropriateness of anti-hypertensive prescriptions, and over-the-counter drug, natural medicine, and lifestyle choice advising. Pharmacists follow-up with their patients over 6 months and maternal drug histories will be linked with the BC Perinatal Database at the end of the study.

Preliminary data suggest that pharmacists are capable of completing these study tasks and that these activities may provide measurable benefits to the population, however, patient recruitment has been sluggish and additional pharmacist surveys are being designed to identify the source.

### 3. Falling Through the Cracks: A Novel, Multidisciplinary Strategy to Improve DMARD Prescribing in Rheumatoid Arthritis

With the development of novel therapeutics over the last 10 years, the treatment paradigm for rheumatoid arthritis (RA) has shifted. Early, aggressive treatment with disease-modifying anti-rheumatic drugs (DMARDs) is now considered the best therapy, however, new guidelines have been slow to translate this into practice. In BC, more than half of patients with RA are not receiving a DMARD. Although rheumatologists prescribe DMARDs with regularity, accessing and identifying RA patients that have not yet received a DMARD is difficult. Most patients that have never received a DMARD for their RA do not see a rheumatologist.

Community-based pharmacists have access to medication histories and interact with all RA patients whether they are receiving long-term NSAIDs, corticosteroids, DMARDs, or some combination. Pharmacists are uniquely placed to identify patients that have been diagnosed with RA, not receiving DMARD therapy, and then implement an intervention. This multi-disciplinary strategy relies on pharmacist identification of appropriate patients, pharmacist referral to a physiotherapist, and physiotherapist assessment of active inflammation. The prescribing physician is then sent a report including the patient's RA prescription history and current levels of active inflammation requesting a switch to DMARD therapy or patient referral to a rheumatologist.

Patient recruitment is ongoing and preliminary results show that community-based pharmacists are willing to lead multi-disciplinary interventions, can access and identify RA patients that aren't receiving appropriate therapy, and can provide evidence to prescribing physicians to move those patients to DMARD therapy. This project was funded by the CIORA initiative through the Canadian Rheumatology Association and the Canadian Arthritis Network.

### 4. Economic Evaluation for the Detection/Screening for Pulmonary Hypertension in Systemic Sclerosis Patients

Current projects include a systematic review of cost-effectiveness analyses for the diagnosis of pulmonary embolism. Pulmonary embolism has an estimated prevalence of approximately 23 per 100,000 people, and diagnosis can be difficult due to symptoms that are shared with other pulmonary or cardiac conditions. As such, systematically evaluating diagnostic strategies can have important clinical applications and aid future research.

We are also working on a project relating to the early detection of pulmonary hypertension in systemic sclerosis (SSc) patients. The prevalence of pulmonary hypertension has been reported to be significantly higher in this sub-population, and as such, finding a cost-effective diagnostic strategy to detect the presence of pulmonary hypertension can have a marked effect on the outcomes of these patients.

### 5. The Prevention of Organ Failure (PROOF) Centre – Economic evaluation of biomarker strategies

The mission of the PROOF Centre of Excellence is “to discover, develop, commercialize and implement non-invasive biomarker tests for the prevention, prediction, diagnosis, management, and treatment of diseases associated with organ failure.” As such, economic evaluation is central to this mission in determining value for money for these testing strategies. These evaluations assist in the development and implementation phases of these strategies and provide evidence for reimbursement from third party payers. Currently, CORE is participating in economic evaluations of the following programs:

- i) Biomarkers in Transplantation program
- ii) Chronic obstructive pulmonary disease
- iii) Chronic heart failure
- iv) Chronic kidney disease



*“CORE provides the health economics infrastructure for the Prevention of Organ Failure (PROOF) Centre of Excellence. The PROOF Centre develops blood tests that can be used as tools for physicians to better manage patients with heart, lung, and kidney failure. The Centre uses a partnership model to bring in needed expertise to develop and implement these blood tests. In working with our current and prospective partners, many describe the health economic models provided by CORE as a distinguishing feature of the PROOF Centre. The models provide the evidence needed to implement the new tests in a variety of organizations.”*

*Janet Wilson-McManus  
 Chief Operating Officer  
 PROOF Centre of Excellence*

## 6. Calculating Direct Health Care Costs Associated with Asthma in British Columbia, 2002-2007

Asthma is one of the most common chronic diseases in Canada, and during the last decade the prevalence appears to be increasing. The primary goal of asthma management is to control the disease in order to prevent morbidity and mortality in a cost-effective way. However, this objective is not always reached and the majority of Canadians with asthma remain inadequately controlled. This has resulted in a significant economic burden of asthma and there is evidence suggesting that this increased economic burden disproportionately affects patients with suboptimal asthma control. The overall impact of asthma in the general population remains unclear and with the increasing prevalence of asthma, it is quite likely that the direct costs of asthma have continued to increase during the last decade in Canada.

Therefore, we performed a population-based cohort study to examine the direct health care resource utilization attributable to asthma from the payer’s perspective in British Columbia (BC) for the years 2002-2007, and to evaluate the impact of asthma control on asthma-related resource utilization. The main strength of this study is the use of several linked health administrative databases from the government of BC allowing the identification of all asthmatic patients in BC. Thus, we analysed the data from Population Data BC, a patient-level database of health care and health services data, population and demographic data, and occupational data from 1985 onwards on BC’s 4.5 million residents with health insurance. In addition, for each subject, we had access to the PharmaNet database which captures data on all prescription drug dispensations for the entire BC population. This study is part of the Platform for Outcomes Research and Translation in Asthma and Allergy (PORTAL), funded by AllerGen NCE.



*“One of the emerging objectives of AllerGen NCE has been to develop Canadian capacity in health economics and outcomes research relating to asthma and allergy. The funding of the Platform for Outcomes Research and Translation in Asthma and Allergy (PORTAL) under the leadership of Drs. Lynd and Marra at CORE has helped AllerGen achieve this objective. The results of the PORTAL studies relating to the economic burden of asthma, and their preference research pertaining to preferences for asthma control and food allergen labeling, has contributed significantly to the overall goal of AllerGen, which is to use research to improve the lives of Canadians affected by allergic disease.”*

*Judah A. Denburg, MD, FRCP(C)  
 William J. Walsh Professor of Medicine, Director, Immunology & Allergy, Scientific Director, AllerGen NCE  
 Michael G. DeGroot School of Medicine, Faculty of Health Sciences, McMaster University*

## 7. Evaluating Parental and Pediatric Preferences for Asthma Control in Children using Best-Worst Scaling

Children with asthma may experience night-time symptoms that cause sleep disruption, wheezing or tightening of the chest, asthma attacks requiring emergency visits, or limitations in their usual physical activities. When asthma symptoms worsen, children may have to take more doses of the existing prescribed medication, change to a higher strength of the same medication, or add a new medication to what is currently used. The goal of this choice experiment was to determine the preferences of parents of children with asthma, and of adolescents with asthma, for different attributes of asthma control. Using a best-worst choice experiment, we aim to determine the relative importance of various attributes that affect optimal asthma control based on stated preferences of children or their parents. The pilot stage of this study has been completed in collaboration with Dr. Wendy Unger at The Hospital for Sick Children, Toronto; the main phase of study is currently in progress.

## 8. The Health Care Costs of Systemic Autoimmune Rheumatic Disorders (SARDs)

Systemic autoimmune rheumatic disorders (SARDs) are chronic and rare disorders that include systemic lupus erythematosus, systemic sclerosis, Sjögren's disease, poly/dermato-myositis, and systemic vasculitis. Most studies evaluate these diseases individually despite the fact that they share similar manifestations and treatment. This creates limited research and advancement of knowledge of these diseases. The number of Canadians living with SARDs and the associated costs is unknown. Some studies have suggested that patients with SARDs are more likely to get heart disease and osteoporosis fractures as part of the disease itself or as a consequence of the therapies used for their treatment (e.g. corticosteroids). As such, the objectives of this project are to estimate the total and attributable health care costs in patients with SARDs in BC using administrative databases, and to determine which health care resources (ie. drugs, health care professional visits, hospitalizations) are being consumed.

The results of this research will show the importance of studying SARDs as a group and identify the impact of SARDs on the health care system. The results of this project will be the first step in establishing SARDs research as a priority. This research will improve disease management by providing guidance to physicians and SARDs patients on modifying potential factors associated with an increased risk for other diseases and their associated mortality. We are collaborating with Dr. Antonio Avina from the Arthritis Research Centre of Canada on this project. Currently, Ms. Natalie McCormick is working on this project as a MSc student jointly supervised by Drs. Avina and Carlo Marra.

*“Systemic autoimmune rheumatic diseases (SARDs) are relatively rare disorders associated with considerable morbidity and mortality. The current burden of these diseases in BC and Canada is not well known. We have assembled a strong transdisciplinary team with expertise in health services research, health economics, arthritis, epidemiology, research methods and knowledge transfer. Our goal is to comprehensively characterize the disease burden using a population-based sample, which is a critical first step to improving the clinical management of these conditions and preventing debilitating co-morbidities. In the spirit of genuine collaboration, the CORE team has brought a wealth of expertise and commitment to evaluating the economic burden of SARDs and factors associated with high costs. Undoubtedly, CORE have played an integral role in securing the funds necessary to make this project a success. As a result, this research will provide the benchmark information needed to implement more judicious use of health care resources, new therapies, interventions on prevention of co-morbidities and their related mortality, all of which has significant direct and indirect cost saving implications.”*



**Antonio Aviña MD, MSc, PhD**  
 BC Lupus Society Scholar, Arthritis Research Centre of Canada  
 Assistant Professor (Medicine), University of British Columbia

## Spotlight on Students

### Graduating Students

#### Katie Sweeney



Katie graduated from Niagara University in New York with a BSc in biology with a pre-med concentration and a minor in criminal justice. During her undergraduate studies, she also played four years of Division I hockey on a Niagara women's hockey team. Katie joined CORE as a UBC Master's student under Larry Lynd's supervision in the Faculty of Pharmaceutical Sciences. Her research area involved health outcomes evaluation and health-related quality of life.

Katie has taken the knowledge she gained during her Master's thesis work on health related quality of life outcomes in knee arthroplasty for the treatment of OA and translated it into the field of medical/dental device sales at Hayes Handpiece in Vancouver BC. She is able to apply these technical and clinical aspects learned during her time with CORE to providing health care professionals with some of the best dental and surgical tools and devices on the market. She is also able to educate offices on a variety of procedures that help with the efficiency and cost-effectiveness of their practices.

#### Belinda Chen



Belinda received her Masters degree in the Faculty of Pharmaceutical Sciences at UBC under Dr. Larry Lynd's supervision. She focused on pharmacoeconomics, and her specific research involved the analysis of risk-benefit tradeoffs for drug treatments for rheumatoid arthritis. The title of her project was "Risk-benefit tradeoffs for NSAIDs for the management of those with rheumatoid arthritis (RA) - A discrete choice experiment (DCE)".

Traditionally, drug approval or withdrawal decisions are based on the risk of adverse events (AEs) and not on the benefits or patients' preferences for the benefits. However, disregarding patients' preferences can result in decisions with significant negative effects on patients when treatments are withdrawn due to risks that patients are willing to accept given the potential benefit. The primary objective of this study was to quantify the risk preferences of patients with RA, ie. how much potential risk are they willing to accept in order to gain a specified potential benefit, using a discrete choice experiment (DCE).

The results of this study showed that patients with RA are willing accept an increased risk of peptic ulcer, stroke, and heart attack that is greater than that they would be exposed to with specific non-steroidal anti-inflammatory drugs in exchange for an improvement in function. Thus, in this study, we were able to demonstrate that for RA patients the potential benefits of NSAIDs outweigh the potential risks. Thus, a greater understanding of patients' risk preferences may aid decision-makers in making better-informed drug approval and withdrawal decisions.

### Mehdi Najafzadeh



Mehdi is a PhD candidate with Dr. Carlo Marra in the Faculty of Pharmaceutical Sciences, UBC. His doctoral thesis is about applying methods of economic evaluation and preference elicitation in the context of genetic testing and personalized medicine.

A growing number of genetic tests have become available that can be used to determine predisposition to different diseases, to improve current diagnostic methods, or to guide treatments. In his thesis, Mehdi has conducted several case studies to show how genomics will affect physicians, patients, the public, and health care decision makers in the coming years. By applying several new tools in those case studies (system dynamics simulation, discrete event simulation, best worst scaling experiment, and discrete choice experiment), he also has shown how using methods initially developed in other disciplines can extend our current capacity for evaluating new health technologies.

Mehdi's doctoral research is being supported by a Canada Graduate Scholarship from CIHR, and he also holds a Four-Year Fellowship from UBC. In addition to his MA in Economics from UBC, Mehdi holds a BSc in Electrical Engineering from Sharif University of Technology. He originally joined CORE in 2005 as a health economist.

### Mohsen Sadatsafavai



Mohsen is a third year PhD student with CORE. He received his MD degree from Tehran University of Medical Sciences in Iran in 2002. After working for 2.5 years as a research fellow at the Digestive Diseases Research Center in Tehran, he moved to Vancouver in September 2005 as a student in the Master of Health Sciences (MHSc) program in Epidemiology and Community Health. He graduated a year later and immediately joined CORE in 2006 as a research fellow. During his employment with CORE he worked mainly as a health economist and has performed cost-effectiveness analysis in various areas including tuberculosis, sleep apnea, asthma, and intracranial aneurysms.

Enjoying this new-found field, Mohsen decided to put the focus of his academic endeavors on health economics. He became a PhD student with CORE in September 2009. Mohsen's PhD research is in Value of Information (VoI) analysis in economic evaluation of health technologies and medical decision making. Value of information is a relatively new set of concepts, methods, and practice standards for prioritizing future research based on the available evidence; VoI helps quantitatively pinpoint those gaps in the evidence that is most influential in our decision to use medical resources. Mohsen's thesis is a combination of novel methods for the calculation of VoI-related measures as well as practical analysis of real world data, specifically the VoI analysis of randomized controlled trials. For Mohsen, the time spent with CORE has been a fine combination of learning and productivity. His knowledge of health economics, biostatistics, and epidemiology has been growing steadily, as well as his productivity, all thanks to CORE's "open" environment, a resourceful environment in which group members are encouraged and supported to introduce new concepts and pursue their own ideas.

## Postdoctoral Fellows

### Pierrick Bedouch



Pierrick joined CORE in the fall of 2010 as a Postdoctoral Fellow. After studying pharmacy in Paris, he moved to the Grenoble University Hospital (France) for his residency and completed his PharmD degree in 2002. From 2002 to 2008, he worked as a hospital pharmacist at the Grenoble University Hospital. While clinical pharmacy activities in most European countries are just developing, from 2008-2010 Pierrick worked as a clinical pharmacist in the respiratory ward of the hospital.

He shared his professional activities between the hospital, teaching clinical pharmacy at Grenoble University, and conducting clinical pharmacy research within the ThEMAS research team (TIMC-IMAG department of the French National Center for Scientific Research CNRS). Pierrick completed a PhD in health care sciences in 2008. He is interested in research evaluating the role of the clinical pharmacist and reducing adverse drug events including evaluation of health technologies (CPOE, automated drug dispensing system, and others).

Before evolving to Clinical Assistant Professor at Grenoble University, Pierrick was interested in completing a postdoctoral fellowship in the area of pharmaceutical outcomes research, clinical pharmacy education, and practice. As a result, since joining CORE Pierrick has been working on the AllerGen NCE supported project involving the evaluation the economic costs of asthma in BC.

### I fan Kuo



I fan is currently a Postdoctoral Fellow with CORE. She has completed a BSc(Pharm) from the University of British Columbia followed by an Accredited Hospital Pharmacy Residency at St. Paul's Hospital in Vancouver (2004). She went on to complete Doctor of Pharmacy (PharmD) degree at UBC in 2009. I fan has worked as a cardiac pharmacist in the cardiology area at St. Paul's Hospital in between and after her post-baccalaureate education.

She started her fellowship training at CORE in August 2010 under the guidance of Drs. Larry Lynd and Carlo Marra during which she is also undertaking a MSc(Pharm) degree at UBC. She has received a postdoctoral fellowship award from the Heart and Stroke Foundation of Canada. Her primary research interest is in the area of risk-benefit decision making in cardiovascular diseases, specifically regarding the choice of antithrombotics for stroke prevention in patients with atrial fibrillation.

### Nick Bansback



Nick Bansback completed his PhD in health economics and decision sciences at the University of Sheffield, UK under the supervision of Dr. John Brazier. He is currently a postdoctoral fellow in the School of Population and Public Health at UBC, funded by the Canadian Arthritis Network/Arthritis Society and supervised by Drs. Larry Lynd, Stirling Bryan and Linda Li.

His postdoctoral work is looking to tools that integrate patients' values into the clinical consultation. This will extend his methodological research on measuring and valuing health. He is currently developing a number of studies to compare different value clarification methodologies, one of which is based on a decision aid for rheumatoid arthritis patients who are considering methotrexate therapy. After the decision aid, the patients are randomly assigned to either a conventional value clarification exercise based on a rating scale, or a new exercise based on a constant sum. The study will provide useful insight into how patients derive values, and whether conventional techniques are limiting rather than helping patients.

### New Students

#### Nicole Tsao



Nicole joined CORE in October 2010 as a Pharmacy undergraduate student and will be starting her second year of Pharmacy in the fall of 2011. Nicole also holds a BSc in Biology from The University of British Columbia and an MSc in Pharmacy, with a focus on pharmacoconomics from the Department of Pharmaceutical Outcomes and Policy at University of Florida.

Nicole brings her previous research experience in the private sector in a myriad of disease areas involving cost-effectiveness evaluations, cost of illness studies, and systematic literature reviews to CORE. In addition to her interest in health economics, she has also developed an interest in pharmacy practice research. Currently, Nicole is involved in a number of research projects at CORE looking at expanding pharmacists roles in the community setting.



### Ryan Maltais



Ryan completed a BSc Pharmacy from Dalhousie University in Halifax, Nova Scotia in 2006. After graduation he worked as a community pharmacist in Ontario in both urban and rural settings before relocating to Vancouver in May 2010. Ryan is beginning a MSc in the Faculty of Pharmaceutical Sciences under the supervision of Dr. Carlo Marra in January 2011. His specific interests lie in the areas of health economics and health outcomes evaluation as well as advancing the role of community pharmacists. Ryan's MSc project is an evaluation of the impact of academic detailing to family physicians.

### Lilla Roy



Lilla completed her Bachelor of Science in Nursing at Laurentian University (Sudbury, ON, 2008), where she also competed on the nordic ski team. Since then, Lilla has worked as an emergency/trauma nurse at the Sudbury Regional Hospital, for Canadian Blood Services in Northern Ontario, and is currently at Lion's Gate Hospital emergency in North Vancouver. In the fall of 2010, Lilla started her Master of Science in the faculty of Pharmaceutical Sciences under the supervision of Dr. Larry Lynd. Lilla's primary interests are in medication adherence and patient preference, particularly in the area of cardiovascular disease.



## Grant Funding in 2010

### Canadian Arthritis Network - NCE

#### Falling Through the Cracks; Using a Multidisciplinary Strategy to Improve DMARD use in Rheumatoid Arthritis

C  
\$119,963 (\$119,963)  
2010-2011

Dr. Carlo Marra

Dr. Linda Li  
Dr. Diane Lacaille  
Dr. W. John Mail  
Dr. Kelly Grindrod  
Dr. Allyson Jones  
Dr. Kam Shojanian  
Dr. Ross Tsyuki

### Canadian Institute for Health Research

#### The Feasibility of Using Community Pharmacists in Focused Surveillance for Drug Safety and Effectiveness: A Case Study of Anti-Hypertensives in Pregnancy

C  
\$96,684 (\$96,684)  
2010-2011

Dr. Carlo Marra

Dr. Larry Lynd (Co-principal investigator)  
Dr. E. Ferreira  
Dr. L. Magee  
Dr. P. Von Dadelszen

### Canadian Initiative for Outcomes in Rheumatological Care (CIORA)

#### Falling Through the Cracks; Using a Multidisciplinary Strategy to Improve DMARD use in Rheumatoid Arthritis

C  
\$57,341  
2010

Dr. Carlo Marra

Dr. Linda Li  
Dr. Diane Lacaille  
Dr. W. John Mail  
Dr. Kelly Grindrod

**Canadian Institute for Health Research**  
**Effects of Prescription Adaptation and Renewal by Pharmacists**

C  
\$103,158 (\$309,472)  
2010-2013

Dr. Michael R. Law

Dr. Carlo Marra  
Dr. Larry Lynd  
Dr. SR Majumdar  
Dr. Steven Morgan

**AstraZeneca Canada**  
**Evaluating pharmacist prescribing of single inhaler therapy in uncontrolled asthma – A pilot study**

NC  
\$59,931  
2010

Dr. Larry Lynd



## Publications and Presentations in 2010

### Publications

1. Davis JC, Marra CA, Robertson MC, Najafzadeh M, Liu-Ambrose T. Sustained economic benefits of resistance training among community-dwelling senior women. *Journal of the American Geriatrics Society* (accepted December 2010).
2. Grindrod KA, Marra CA, Colley C, Tsuyuki RT, Lynd LD. Pharmacists' preferences for providing patient-centered services: a discrete choice experiment to guide health policy. *Ann Pharmacother* 2010 Oct;44 (10):1554-64.
3. Lynd LD, Marra CA, Najafzadeh M, Esdaile JM, Sadatsafavi M. A benefit-risk analysis of rofecoxib relative to naproxen in arthritis – an application of the incremental net-benefit framework. *Pharmacoepidemiol and Drug Safety* 2010; 19 (11): 1172-80.
4. Guimares C, Marra CA, Gill S, Simpson S, Meneilly G, Queiroz RH, Lynd LD. A discrete choice experiment evaluation of patients' preferences for different risk, benefit and delivery attributes of insulin therapy for diabetes management. *Patient Prefer Adherence* 2010 Dec;4:433-40.
5. Lester RT, Ritvo P, Mills EJ, Kariri A, Karanja S, Chung MH, Jack W, Habyarimana J, Sadatsafavi M, Najafzadeh M, Marra CA, Estambale B, Ngugi E, Ball TB, Thabane L, Gelmon LJ, Kimani J, Ackers M, Plummer FA. Effects of a mobile phone short message service on antiretroviral treatment adherence in Kenya (WelTel Kenya1): A randomized trial. *Lancet*. 2010 Nov 27;376(9755):1838-45. Epub 2010 Nov 9.
6. Law MR, Morgan SG, Majumdar SR, Lynd LD, Marra CA. Effects of prescription adaptation by pharmacists. *BMC Health Serv Res*. 2010 Nov 17;10:313.
7. Davis JC, Marra CA, Beattie BL, Robertson MC, Najafzadeh M, Graf P, Nagamatsu LS, Liu-Ambrose T. Are there cognitive and economic benefits of resistance training among community-dwelling senior women: A 1-year follow-up study of the Brain Power Study. *Arch Intern Med* 2010 Dec 13;170(22):2036-2038.
8. Marra F, Kaczorowski JA, Marra CA. Assessing pharmacists' attitudes regarding delivery of the pandemic influenza vaccine in British Columbia. *Canadian Pharmacists Journal*: November 2010, Vol. 143, No. 6, pp. 278-284.
9. Davis JC, Robertson MC, Ashe MC, Khan KM, Marra CA. International comparison of cost of falls in older adults living in the community: a systematic review. *Osteoporos Int* 2010 Aug;21:1295-306.
10. Slobogean GP, Younger A, Apostle KL, Marra CA, Wing K, Penner M, Daniels T, Glazebrook M. Preference-based quality of life of end-stage ankle arthritis treated with arthroplasty or arthrodesis. *Foot Ankle Int*. 2010 Jul;31(7):563-6.
11. Guo N, Marra F, Fitzgerald JM, Elwood RK, Marra CA. Impact of adverse drug reaction and predictivity of quality of life status in tuberculosis. *Eur Respir J*. 2010 Jul;36(1):206-8.
12. Johnston KM, Marra CA, Connors JM, Najafzadeh M, Sehn L, Peacock SJ. Cost-Effectiveness of the Addition of Rituximab to CHOP Chemotherapy in First-Line Treatment for Diffuse Large B-Cell Lymphoma in a Population-Based Observational Cohort in British Columbia, Canada. *Value Health*. 2010; Sep-Oct;13(6): 703-11. PMID: 20561333

13. Sadatsafavi M, Marra CA, Li D, Illes J. An ounce of prevention is worth a pound of cure: a cost-effectiveness analysis of incidentally detected aneurysms in functional MRI research. *Value Health*. 2010 Sep-Oct; 13(6): 761-9 PMID: 20561317.
14. Guimaraes C, Marra CA, Simpson SH, Meneilly GS, Queiroz RHC, Gill S Lynd LD. Exploring patients' perceptions for insulin therapy in type 2 diabetes: a Brazilian and Canadian qualitative study. *Patient Pref Adherence* 2010; 4: 171-9.
15. Grindrod K, Marra CA, Colley L, Oteng B, Cibere J, Tsuyuki RT, Esdaile JM, Gastonguay L, Kopec J. After patients are diagnosed with knee OA, what do they do? *Arthritis Care Res*. 2010 Apr;62(4):510-5.
16. Woolcott JC, Richardson KJ, Khan KM, Marra CA. Medication and Falls in Elderly Persons. *Arch Intern Med*, May 2010;170:835.
17. Regier DA, Friedman J, Marra CA. Value for money? Array genomic hybridization for diagnostic testing for genetic causes of intellectual disability. *American Journal of Human Genetics* 2010; May 14;86(5):765-72.
18. Davis JC, Marra CA, Najafzadeh M, Liu-Ambrose T. The Independent Contribution of Executive Functions to Health Related Quality of Life in Older Women. *BMC Geriatrics* 2010 Apr 1;10(1):16.
19. Davis JC, Marra CA, Robertson MC, Khan KM, Najafzadeh M, Ashe M, Liu-Ambrose T. Economic evaluation of dose-response resistance training in older women: a cost effectiveness and cost utility analysis. *Osteoporosis International* 2010 (Online First).
20. Sadatsafavi M, Lynd LD, Marra CA, Carleton B, Tan WC, FitzGerald JM. Direct health care costs associated with asthma in British Columbia. *Can Resp J* 2010; 17 (2): 74-80.
21. Sadatsafavi M, Shahidi N, Marra F, Fitzgerald MJ, Elwood KR, Guo N, Marra CA. A statistical method was used for the meta-analysis of tests for latent TB in the absence of a gold standard, combining random-effect and latent-class methods to estimate test accuracy. *J Clin Epidemiol*. 2010 Mar;63(3):257-69.
22. Woolcott JC, Ashe MC, Miller WC, Shi P, Marra CA. Does physical activity reduce seniors' need for health care? A study of 24,281 Canadians. *Br J Sports Med*. 2010 Feb;44(2):80-9.
23. Davis JC, Robertson MC, Ashe MC, Liu-Ambrose T, Khan KM, Marra CA. Does a home-based strength and balance programme in people aged  $\geq 80$  years provide the best value for money to prevent falls? A systematic review of economic evaluations of falls prevention interventions. *Br J Sports Med*. 2010 Feb;44(2):80-9.
24. Guo N, Marra CA, Marra F. A response to Weis and Pasipanodya 'Measuring health-related quality of life in tuberculosis: a systemic review – Response. *Health Qual Life Outcomes*. 2010 Jan 15;8(1):6.
25. Kliber A, Lynd LD, Sin DD. The effects of long acting bronchodilators on total mortality in patients with stable chronic obstructive pulmonary disease. *Resp Res* 2010; 11: 56.
26. Wilbur K, Lynd LD, Sadatsafavi M. Low molecular weight heparin versus Unfractionated Heparin for Prophylaxis of Venous Thromboembolism in Medicine Patients – A Pharmacoeconomic Analysis. *Clin Applied Thromb Hemostasis* 2010; In Press.

27. Johnson FR, Hauber AB, Ozdemir S, Lynd LD. Quantifying Women's Stated Benefit-Risk Trade-Off Preferences for IBS Treatment Outcomes. *Value Health*. 2010; 13 (4): 418-23.

28. Thornton SJ, Wasan KM, Lynd LD, Wasan EK. Different financial barriers in treating Visceral Leishmaniasis in India (Bihar Region), Bangladesh, Nepal, Brazil, and Sudan. *Drug Dev Indust Pharm* 2010; 36 (11):1312-9.

### Presentations

1. Lynd, LD. Risk benefit analysis: combination LABA+ICS vs ICS alone for the treatment of asthma. 3rd Annual UBC Centre for Lung Health Research and Policy Day. March 26, 2010. Vancouver, BC.

2. Marra, CA. Critical Appraisal of Evidence. Texas Club of Internists Fall Clinical Meeting. Sept 27-29, 2010. Fairmont Pacific Rim Hotel, Vancouver, BC.

3. Marra, CA. Personalized medicine: Value for Money? Mini Med School 11. Clinical Genomics. Child and Family Research Institute. Vancouver, BC, October 27, 2010.

4. Marra CA. Pharmacists: Pill Counters or Primary Care Practitioners? PHC Research Institute's "Researchers Abroad" lecture series. St. Paul's Hospital, Vancouver, BC, May 10th, 2010.

5. Marra, CA. Pharmacists Conducted OA Screening. Cost-effectiveness and health economy in non-pharmacological care session, CARE VI Conference, Nancy, France, April 29th, 2010.

6. Marra, CA. Health economics: Is research cost-effective? 4th Annual Heart, Lung and Blood Research & Education FEST, Sutton Place Hotel, Vancouver, B.C., March 9, 2010.

7. Marra, CA. Evaluation of Pharmacy Prescription Adaptation Services in British Columbia. Faculty of Pharmaceutical Sciences, UBC, Research Seminar, February 3, 2010.

8. Marra, CA. Evaluation of Pharmacy Prescription Adaptation Services in British Columbia. St. Paul's Hospital Work in Progress Rounds, January 27, 2010.

9. Marra, CA. Economic evaluation of the addition of rituximab to CHOP chemotherapy in diffuse large B-cell lymphoma. Genome BC, Vancouver, British Columbia, January 20, 2010.

10. Marra, CA. Health resource utilization and economics as it relates to mobility in vulnerable seniors. Centre for Hip Health and Mobility (CHHM), Team Meeting, Vancouver Coastal Health Research Institute, Vancouver, British Columbia, January 7, 2010.

11. Marra, CA. Research Gaps for Primary Care in Musculoskeletal Health. CIHR Institute of Musculoskeletal Health and Arthritis Summit, CIHR Primary Care Summit, Toronto, Ontario, January 19, 2010.

## Conference Abstracts

1. Wong-Regier D, Lynd LD, Drummond M, Menon D. The value of patients' preferences in Health Economics. 15th Annual Meeting – International Society of Pharmacoeconomics and Outcomes Research. May 15 – 19, 2010. Issues Panel.
2. Lynd LD, Marra CA, Harvard S, Liu J, Najafzadeh M, FitzGerald JM, Sin D. Risk benefit analysis of LABA + ICS versus ICS alone for the treatment of asthma. Canadian Association for Population Therapeutics Annual Conference, Toronto, ON. March 28-30, 2010.
3. Davis JC, Marra CA, Robertson MC, Khan K, Liu-Ambrose T. Economic evaluation of a dose-response resistance training intervention in older women. 4th Annual Australian and New Zealand Falls Prevention Conference, Dunedin, New Zealand. November 2010.
4. Davis JC, Marra CA, Robertson MC, Najafzadeh M, Liu-Ambrose T. Are the economic benefits of resistance training sustained among community-dwelling senior women? 4th Annual Australian and New Zealand Falls Prevention Conference, Dunedin, New Zealand. November 2010.
5. Davis JC, Marra CA, Bryan S, Liu-Ambrose T. Falls-related self-efficacy is independently associated with health related quality of life in older women. 4th Annual Australian and New Zealand Falls Prevention Conference, Dunedin, New Zealand. November 2010.
6. Davis JC, Liu-Ambrose T, Robertson C, Najafzadeh M, Marra CA. A prospective comparison of the SF-6D and EQ-5D in older women. 4th Annual Australian and New Zealand Falls Prevention Conference, Dunedin, New Zealand. November 2010.
7. Davis JC, Marra CA, Ashe MC, Khan KM, Robertson MC, Liu-Ambrose T. Economic evaluation of dose-response resistance training among older women: a cost effectiveness and cost utility analysis. Canadian Agency for Drugs and Technologies in Health. Halifax, Nova Scotia, April 18-20, 2010.
8. Davis JC, Marra CA, Ashe MC, Khan KM, Robertson MC, Liu-Ambrose T. Economic evaluation of dose-response resistance training among older women: a cost effectiveness and cost utility analysis. Falls Prevention Conference, Vancouver, BC, March 22-24, 2010.
9. Woolcott JC, Khan KM, Anis AH, Marra CA. Seniors presenting to the Emergency Department after a fall: costs and consequences. Canadian Association for Population Therapeutics 2010 Annual Conference, March 28-30, 2010, Toronto, Ontario. Oral Presentation.
10. Woolcott JC, Khan KM, Anis A, Marra CA. The costs associated with a seniors injurious fall. 2010 Canadian Agency for Drugs and Technologies in Health Symposium, April 18-20, 2010. Poster presentation.
11. Marra CA, Harvard SS, Wilby K, De Silva J, Lynd LD. A randomized controlled trial evaluating pharmacglyph augmentation of patient information for HIV drugs. International Pharmaceutical Federation (FIP). Lisbon, Portugal, September 2010. (podium)

12. Marra CA, Cibere J, Tsuyuki R, Esdaile J, Gastonguay L, Colley L, Oteng B, Embley P, Soon J, Khan K, Li LC. Pharmacist initiated intervention trial in osteoarthritis (PhIT-OA): Results of a randomized multidisciplinary intervention for knee osteoarthritis. International Pharmaceutical Federation (FIP). Lisbon, Portugal, September 2010. (Awarded Best Community Pharmacy Research Poster).
13. Guo N, Marra F, Marra CA, Elwood RK, Fitzgerald JM. Evaluating people's preferences for preventive treatment in latent tuberculosis infection using a discrete choice experiment (DCE). International Society for Pharmacoeconomics and Outcomes Research (ISPOR) 15th Annual International Meeting, Atlanta, Georgia, May 15-19, 2010.
14. Marra C, Lynd L, Grindrod K, Joshi P, Isakovic A. An Overview of Pharmacy Adaption Services in British Columbia. Canadian Pharmacists Association Annual General Meeting in Calgary, AB, May 15 - May 18, 2010, (accepted podium)
15. Marra C, Lynd L, Henrich N, Joshi P. Pharmacy Adaption Services in BC: The Physician Perspective. Canadian Pharmacists Association Annual General Meeting in Calgary, AB, May 15 - May 18, 2010, (accepted podium)
16. Marra CA, Cibere J, Tsuyuki R, Esdaile J, Gastonguay L, Colley L, Oteng B, Embley P, Soon J, Khan K, Li LC. Pharmacist Initiated Intervention Trial in Osteoarthritis (PhIT-OA): Results of a Randomized Multidisciplinary Intervention for Knee Osteoarthritis. Canadian Pharmacists Association Annual General Meeting in Calgary, AB, May 15 - May 18, 2010, (accepted podium)
17. Marra CA, Cibere J, Tsuyuki R, Esdaile J, Gastonguay L, Colley L, Oteng B, Embley P, Soon J, Khan K, Li LC. Pharmacist Initiated Intervention Trial in Osteoarthritis (PhIT-OA): Results of a Randomized Multidisciplinary Intervention for Knee Osteoarthritis. CARE VI Conference, Nancy, France, April 28th – 30th, 2010. (accepted podium)
18. Marra C, Marra F, Richardson K, Lynd L, FitzGerald JM. Are we treating wheeze with bug killer? Canadian Association for Population Therapeutics Annual Conference, Toronto, ON. March 28-30, 2010. (accepted podium)
19. Wang M, Marra C, Richardson K, Elwood K, Fitzgerald M, Marra F. Fluoroquinolone and other antibiotics delay diagnosis of tuberculosis. Canadian Association for Population Therapeutics Annual Conference, Toronto, ON. March 28-30, 2010.
20. Najafzadeh M, Marra CA, Lynd LD, Sadatsafavi M, Sin DD. The economic value of a potential biomarker for chronic obstructive pulmonary disease. Canadian Association for Population Therapeutics Annual Conference, Toronto, ON. March 28-30, 2010.
21. Marra F, Kaczorowski J, Marra C. Assessing Pharmacists' Preparedness for Delivering Pandemic Influenza Vaccine in B.C. Canadian Association for Population Therapeutics Annual Conference, Toronto, ON. March 28-30, 2010.
22. Sadatsafavi M, Marra CA, Lynd LD, Marra F, Liu J, Mendoza O, Tan M, Elwood KR, Fitzgerald JM. Benefit-risk analysis of isoniazid (INH) for treatment in latent tuberculosis infection (LTBI). Canadian Association for Population Therapeutics Annual Conference, Toronto, ON. March 28-30, 2010.

University of British Columbia  
Collaboration for Outcomes Research and Evaluation  
Faculty of Pharmaceutical Sciences  
2146 East Mall  
Vancouver BC, V6T 1Z3  
[www.core.ubc.ca](http://www.core.ubc.ca)

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