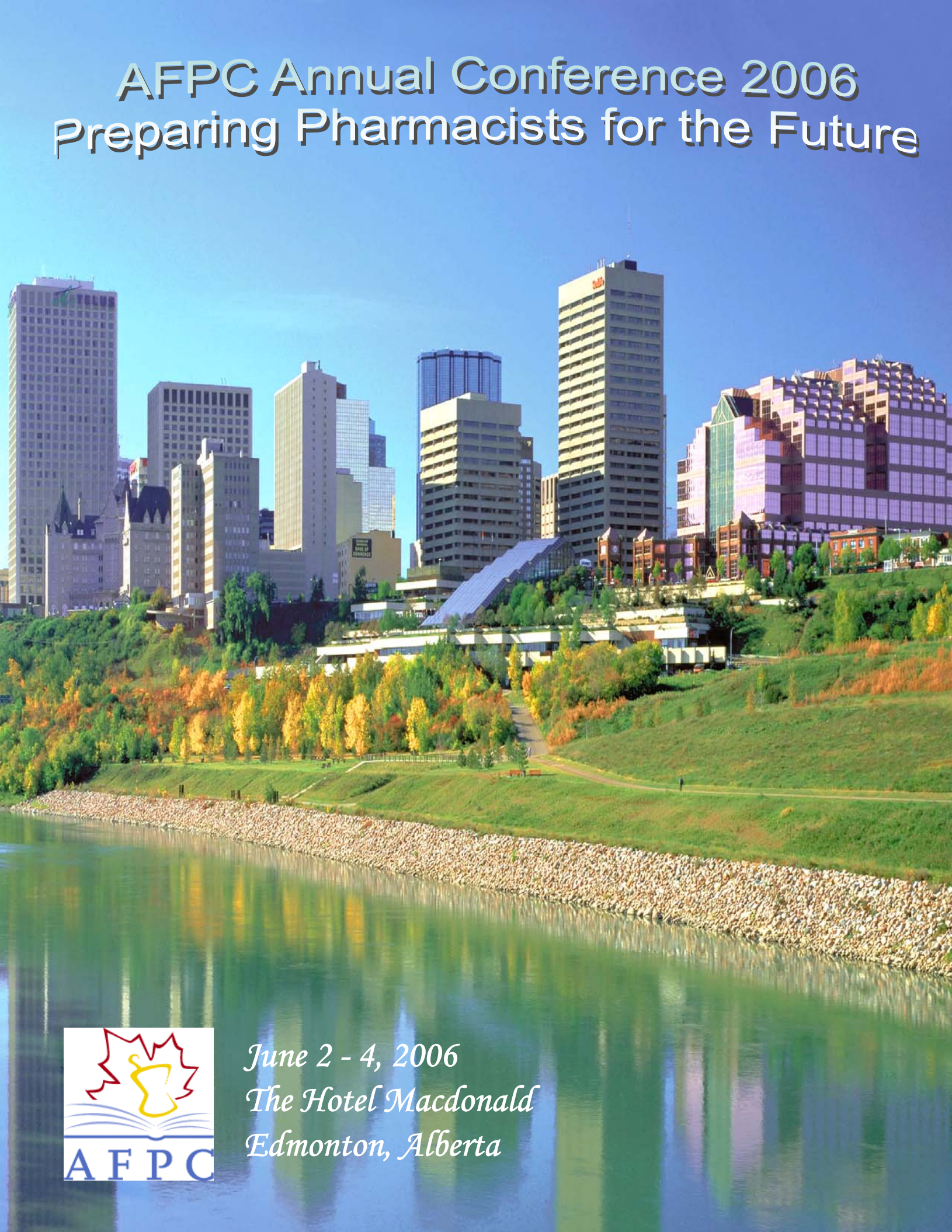
AFPC Annual Conference 2006
Preparing Pharmacists for the Future



AFPC

June 2 - 4, 2006
The Hotel Macdonald
Edmonton, Alberta

Sixty-third Annual Conference of Association of Faculties of Pharmacy of Canada

"Preparing Pharmacists for the Future"

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Welcome from Sharon Mitchell
Chair of Planning Committee

Dear Colleagues and Friends,

On behalf of the AFPC conference Planning Committee, it is my pleasure to welcome you to Edmonton for the sixty–third annual AFPC meeting, Preparing Pharmacists for the Future. I would also like to welcome those attending the CPhA Conference and the Joint AFPC/CPhA Pharmacy Practice Research Symposium.

These are exciting times for the profession of pharmacy. Many changes are taking place providing many challenges and opportunities for growth and new directions. Never before has there been such strong support for the advancement of the profession in Canada as evidenced by Bill 90 in Quebec; the Romanow Report on the Future of Health Care in Canada; the Mazankowski report in Alberta and, most recently, Bill 102 in Ontario. All make strong recommendations that support pharmacists in their role as integral members of the health care team.

As educators and researchers, we must not only support, but, lead advancements in practice, preparing pharmacists not only the practice of today, but for that of the future.

Our Teachers' Conference on Saturday will look at the Future Directions of Pharmacy, focusing on some of the changes in education currently taking place across the country including the development of the Entry-level PharmD at the University of Montreal, Laval University, University of Toronto and the University of Alberta. In addition, we will hear about the development of the first new Faculty of Pharmacy in Canada in many decades at the University of Waterloo. On Sunday, the AFPC/CPhA Joint Pharmacy Practice Research Symposium will focus on the incentives for change in pharmacy practice provided by pharmacy practice research. We are grateful to all of the speakers for sharing their expertise with us.

I would like to thank the local planning committee for their tremendous ideas and support in developing a superb program. I would also like to thank all of the faculty and staff involved in making this conference happen. An inordinate amount of time and effort is dedicated to planning and organizing such a conference and this is very much appreciated. In addition, I would like to especially thank Dr. Frank Abbott who has worked tirelessly to make this conference happen. His warmth and sense of humour make it a delight to work with him. The work that Nancy Coll, Karen Weir, and Angela Todd put into organizing our AFPC / CPhA Joint Pharmacy Practice Research Symposium is greatly appreciated. Finally, I would like to thank our Sponsors for support of this conference.

I hope you enjoy Edmonton and all that the 2006 AFPC Conference has to offer.

Sharon Mitchell Chair, AFPC Conference 2006 Planning Committee

Welcome from Zubin Austin
AFPC President

Dear AFPC Members, Conference Delegates, and Visitors:

Welcome to Edmonton! The theme for Conference 2006 is "Preparing Pharmacists for the Future", a particularly relevant topic given the major changes currently underway in the Canadian health care system. As primary care reform continues to evolve, pharmacists are playing more important roles in health care delivery. Pharmacy educators and scholars have contributed significantly to this evolution, through work on provincial and national task forces and committees, through dissemination of research supporting the value of pharmacists in primary care, and through educating the next generation of practitioners to the highest possible standards. Conference 2006 will allow us an opportunity to reflect on our accomplishments, identify our priorities, and plan for the future of pharmacy education and scholarship.

On behalf of the entire Association, I would like to thank the Edmonton Organizing Committee, and in particular Dr. Sharon Mitchell, for their hard work in organizing this meeting. We are privileged to be able to share our conference with the Canadian Pharmacists' Association, and I look forward to the dialogue that such joint meetings foster. We are truly fortunate to have the contributions of two important national organizations at this meeting.

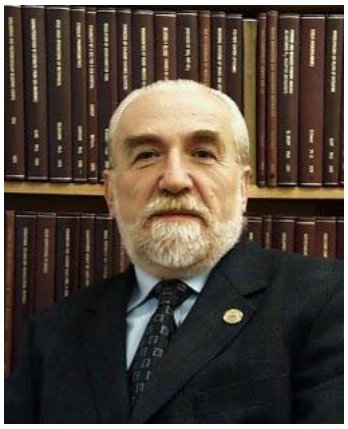
On a personal note, this meeting marks the end of my term as President of your Association. It has been a privilege to have worked with the Council on a variety of important issues to advance academic pharmacy. Incoming President Dr. Anne Marie Whelan will continue this momentum, and I look forward to working with her in the future. I would also like to thank Dr. Frank Abbott, our Executive Director. Frank's tireless efforts on behalf of the organization, his organizational skills, and above all his sense of humour have been invaluable to our organization.

Enjoy your time in Edmonton, and all the opportunities this wonderful city has to offer!

Zubin Austin,
President, AFPC

Welcome from Dr. Franco Pasutto

Dean of the Faculty of Pharmacy and Pharmaceutical Sciences



Dear friends and colleagues. Chers amis et collègues

It is my pleasure to welcome you, on behalf of our Faculty's staff and students, to the 2006 Association of Faculties of Pharmacy of Canada Conference in Edmonton - North America's Stanley Cup Capital.

The theme of our conference is "Preparing Pharmacists for the Future", a subject positioned at the forefront of our profession for several decades; indeed, it has been suggested that we suffer from 'analysis paralysis'. While this might be debated, what has changed? In the last few years federal health care commissions and provincial health departments have clearly recognized, and spoken to, the importance of an expanded role for pharmacists in preventive, primary and chronic care as well as the need to implement alternative compensation models in support of pharmaceutical care. Within this environment the opportunities for underutilized pharmacists have never been greater.

The education program topics and superb speakers were selected to encourage engagement and dialog amongst attendees. Presentations include PharmD and experiential programs, the synergy of pharmacy science and practice, development of confident graduates, the new Waterloo School of Pharmacy and, of course, pharmacy's future. The conference theme will continue in the AFPC/CPhA Joint Pharmacy Practice Research Symposium. Here you will find reaffirmation of the need for practice change as well as innovative practice-based programs and the dramatic positive impact on the well-being of patients when pharmacists are utilized to the fullest extent of their expertise.

There are many staff, students and presenters who have dedicated themselves to the development and delivery of an academically and socially satisfying conference. I sincerely thank these individuals and, if the opportunity arises, please take a moment to do so as well.

Enjoy the warmth of our western hospitality and do not hesitate to raise a libation with your hosts as you cheer for the Edmonton Oilers.

Franco M. Pasutto,
PhD Professor and Dean

AFPC Conference Planning Committee

Chair
Sharon Mitchell

Registration / Logistics
Kelly Nicholson-Scheer, Terri Schindel / Carol Hawkes / Andrew Uminski

Conference Budget
Terry Legaarden / Sharon Mitchell / Frank Abbott

Teachers Conference
Sharon Mitchell / Terri Schindel / Franco Pasutto / Mo Jamali / Scott Simpson / Frank Abbott

AFPC/CPhA Joint Session - Pharmacy Practice Research Presentations
Angela Todd / Nancy Coll / Karen Weir / Frank Abbott / Sharon Mitchell

AFPC/CPhA Joint Session Pharmacy Practice Research Presentations – COMPRIS Program
Ross Tsuyuki / Sharon Mitchell

Conference Program
Carola Ellis / Frank Abbott / Sheila Kelcher / Sharon Mitchell

Signage
Sharon Mitchell

Banquets / Receptions (Opening Dinner, Awards Dinner)
Sharon Mitchell

AFPC Poster Session
Scot Simpson, Mavenaur Suresh, Frank Abbott, Afsaneh Lavasanifar

Looking Ahead to AFPC Conference 2007

The upcoming 2007 AFPC annual meeting will be held at the historic ***Queen Elizabeth Fairmount Hotel*** in the exciting downtown of ***Montreal, Quebec***.

The opening conference dinner on ***Thursday May 31st*** will recognize the remarkable contribution of Canadian scientists and educators in Pharmacy. The AFPC/GRUM/CSPS symposium on Friday morning will highlight success stories from academic research. Participants will then be invited to present their work in a joint poster presentation session, and will have the choice of exploring several sessions on "Innovations in cardiovascular research", "Initiatives in assessing competency outcomes in education" or Pharmacy practice research" in the following days. The closing banquet, to be held on June 2nd, will be followed with Montreal discovering activities! Come and enjoy the Montreal experience!

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Program

AFPC
Association of Faculties of Pharmacy of Canada
Sixty-third Annual Meeting
Fairmont Hotel Macdonald / Shaw Conference Centre
Edmonton, Alberta
June 2-4, 2006

Preparing Pharmacists for the Future

FRIDAY, JUNE 2, 2006

4:00– 7:00	**Registration - Wedgwood Room – Hotel Macdo**nald
6:00 – 7:00	**Reception – Wedgwood Room- Macdonald Hotel**
6:00 – 10:30	**Opening Dinner and Presentations by AFPC Award Winners Wedgwood Room- Hotel Macdonald**
7:00 pm	**Opening of Conference: Welcome from Dr. Franco Pasutto, Dean, Faculty of Pharmacy and Pharmaceutical Sciences University of Alberta, Dr. Sharon Mitchell, AFPC 2006 Conference Chair, Dr. Zubin Austin, Presidents of AFPC**

SATURDAY, JUNE 3, 2006

Teacher's Conference

8:00 – 2:00	**Conference Registration The Drawing Room – Hotel Macdonald**
7:30 – 8:30	**Continental Breakfast The Drawing Room – Hotel Macdonald**
8:30 – 12:00	**Teacher's Conference The Drawing Room – Hotel Macdonald**
8:30 am – 8:40	Opening Remarks-Sharon Mitchell, M.Pharm, PhD.
8:40 – 9:40	The Future of Pharmacy – Where are we going? How can we get there? Dick Gourley, PharmD, Dean, College of Pharmacy, University of Tennessee
9:45 – 10:15	**Break**
10:15 – 10:45	"Creating a More Confident Graduate" William Bartle, PharmD, Sunnybrook Hospital, Toronto, Ontario

10:45 – 11:15	Development of the Entry – Level PharmD in Montreal, Claude Mailhot, PharmD, Vice- Dean, University of Montreal
11:15 – 11:45	Dealing with the Challenges of the Expanded Experiential Program at University of Montreal, Gilles Leclerc, PharmD, Director Experiential Programs, University of Montreal
12:00 – 1:30	**Annual General Meeting - Lunch Provided** The Jasper Room – Hotel Macdonald
1:45 – 5:00	**Teacher's Conference** The Drawing Room – Hotel Macdonald Chair – Mo Jamaili, PhD.
1**:45 – 2:15**	The Synergy of Science and Practice, John Seubert, PhD. and Dr. Scot Simpson BSP, PharmD, MSc, Faculty of Pharmacy and Pharmaceutical Sciences University of Alberta
2:15 – 2:30	The Challenge of Developing a Competency-based Entry-Level PharmD, Monique Richer, PharmD, M.A.(ed), Dean, Faculty of Pharmacy, University of Laval
2:30 – 2:45	Development of a Plan for Implementati*on of the* Entry-Level PharmD at U of T, Nancy Waite, PharmD, University of Toronto
2:45 – 3:15	**Break**
3:15 – 3:30	Development of a Phased-in Entry-Level PharmD at U of A, Sharon Mitchell, M.Pharm, PhD, Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta
3:30 – 3:45	Development of a new school of pharmacy at University of Waterloo, Jake Theissen, PhD, Hallman Director, School of Pharmacy, University of Waterloo
3:45 – 4:00	Entry-Level PharmD – experiences from the front lines Dick Gourley, PharmD, Dean, University of Tennessee
4:00 – 4:30	**Panel Discussion**
4:30	**Closing Remarks**
Saturday Evening –	**Dinner Fort Edmonton Park**

SUNDAY JUNE 4, 2006

AFPC / CPhA Joint Pharmacy Practice Research Symposium 2006
Shaw Conference Centre

7:00 – 8:30	**Breakfast Salon 2, Shaw Conference Centre**
8:30 – 8:45	**Opening Address** – Chair, Bill Semchuk, BSP, M.Sc., PharmD, Regina General Hospital, Regina, Saskatchewan
8:45 – 10:30	**CPhA / AFPC Research Presentations Preparing Pharmacists for the Future, Salon 2 - Shaw Conference Center, Chair Bill Semchuk**
8:45 – 9:00	Impact of a Dyslipidemia Management Workshop on Community Pharmacists' Knowledge; TEAM Workshop, Villeneuve J, Genest J, Lamarre D, Vanier M-C, Lussier M-T, Hudon E, Blais L, Perreault S, Lalonde L
9:00 – 9:15	Exploring Elderly Patients' Perceptions about Strategies to Improve Adherence to Medications: a Qualitative Study, Lau E, Papaioannou A, Dolovich L, Raina P, Burns S, Nair K, Emili A, Kennedy C
9:15 – 9:30	Integration of Web-Based Continuing Pharmacy Education Modules Into an Undergraduate Pharmacy Therapeutics Course, Wiens CA, Schindel T, Varnhagen S, Ackman ML, George-Phillips KL, Tsuyuki, RT
9:30 – 9:45	Accuracy and Quality of Warfarin Patient Information, Diamantouros A, Bartle B, Geerts W, Kim L
9:45 – 10:00	Perceptions of Pharmacist And Family Physician Contributions to Medication-Related Processes: Changes over Time as Pharmacists Integrated Into Family Practice, Farrell B, Woodend K, Pottie K, Yao V, Dolovich L, Kennie N, Sellors C
10:00 – 10:15	Addressing the Hospital Pharmacy Management Crisis: Development of Strategies and Solutions, MacKinnon NJ, Black EK, Roy M, Vaillancourt R, Bowles SK, Thompson A
10:15 – 10:30	Evaluation of the Impact of Teletriage Pharmacists on Patients; Decision-Making and Healthcare Resource Utilization, Tscheng D, Gavura S, Ho C, Cheung T
10:30 – 11:00	**Refreshment Break**
11:00 –12:30	**CPhA / AFPC Research Presentations Preparing Pharmacists for the Future Salons 3 and 4 - Shaw Conference Center**
11:00 – 11:15	Primary Care Intervention and Education in Diabetes: a Pharmacist Coordinated Comparison of Usual Care Versus Collaborative Primary Care in Affecting Diabetes Control And Quality of Life, Rosin J, Townsend, K
11:15 – 11:30	Community Pharmacy Patient Safety and Quality Improvement Pilot Project, DeVos L, Lopatka H, Ontkean S

11:30 – 11:45	An Interdisciplinary Medication Management Program For Seniors In The Community, Waite N, MacKeigan L, Chan D, Wichman K, Applebaum R, VanderBent
12:00 – 1:30	**Lunch / Poster Viewing**
1:30 – 4:00	**Pharmacy Practice Research Presentations** **Preparing Pharmacists for the Future** **The Centre for COMmunity Pharmacy Research and Interdisciplinary Strategies (COMPRIS)** **Salon 2 - Shaw Conference Centre** **Chair – Franco Pasutto, PhD**.
1:30 – 1:35	Introductory Remarks Franco Pasutto, PhD.
1:35 – 1:50	Introduction to COMPRIS, Ross T. Tsuyuki, BSc (Pharm), PharmD, MSc, FCSHP, FACC Faculty of Medicine / Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta
1:50 – 2:05	VIP - The Vascular Intervention Program, Scot H. Simpson, BSP, PharmD, MSc, Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta
2:05 – 2:30	Anticoagulation Management Service, Tammy J. Bungard, BSP, PharmD, Assistant Professor of Medicine, Director AMS Program, Division of Cardiology, University of Alberta
2:25 – 2:45	Educational Support for Practice Change: Challenges and Issues, Terri Schindel, BSP, MSc, FCSHP, Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta
2:45 – 3:15	**Refreshment Break**
3:15 – 3:35	PHIND-OA (Pharmacist Identification of New Diagnostically confirmed OsteoArthritis), Carlo Marra, BSc(Pharm), PharmD, PhD, Vancouver Coastal Health Research Institute, University of British Columbia
3:35 – 3:50	Health Policy and Practice Change, Ross Tsuyuki, PharmD, MSc and David Bougher, BSP, MHSA, COMPRIS, University of Alberta
	Discussion and Closing Remarks

SUNDAY EVENING, June 4

AFPC Awards Banquet, Royal Alberta Museum, 12845 – 102 Avenue, Edmonton, Alberta

AWARD WINNERS

AND

SPEAKERS FOR THE TEACHERS CONFERENCE

The VirRAD project has pulled together experts from Great Britain, Belgium, Austria, Greece, Portugal, the United States and Canada and has garnered significant funding from the Commission of the European Union. This innovative concept resulted in the development of a learning resource incorporating a number of multimedia elements, including a dedicated simulation-based virtual environment in which trainees can gain experience in handling radioactive materials in a radiopharmaceutical laboratory. VirRAD's stated objectives were:

1) the development of an instructional design based on Ellen Langer's Mindful-Learning theory;
2) construction of a multi-layered meta-cognitive learner model within the context of an intelligent, virtual reality enhanced, distance learning environment for professional training, and
3) the creation of an environment within an enriched learning structure that gathers together learners, practitioners and specialists in a knowledge community, using radiopharmacy as the target learning and knowledge exchange area..

The essence of our initiative is that it proposes to maximize the learning potential of the internet, not just provide another series of lecture notes for self-study.

Dr. Steve McQuarrie began his career in the Faculty of Pharmacy and Pharmaceutical Sciences in 1976 as a member of the Division of Bionucleonics and Radiopharmacy. In 1995, upon the completion of his PhD, he joined the professorial ranks as in Associate Professor. Throughout this interval, he has been actively involved in teaching in the radiopharmaceutical sciences at the University of Alberta and more recently, in the development of a new national radiopharmaceutical training program. He is a member of the International Radiopharmaceutical Education Consortium, chair of the curriculum development subcommittee of the Canadian Association of Radiopharmaceutical Scientists and one of the founding members of VirRAD. It was the latter association that has led to a unique teaching resource for the radiopharmaceutical sciences that will play a major role in educating new individuals entering this field. Dr McQuarrie's role in this project was in concept development, implementation strategies and courseware content. Steve is currently on secondment to the Edmonton PET Centre at the Cross Cancer Institute (Faculty of Medicine and Dentistry) where he is a Professor in the Department of Oncology and the Director of Cyclotron Operations. His current, nationally funded research program involves 1) the radioimmunotherapy of ovarian cancer and 2) a radiopharmaceutical science initiative that make use positron emission tomography (PET) to develop molecular models of disease.

Dr. John Mercer earned his BSc at Mount Allison University before moving to Edmonton to complete an MSc in chemistry and then a PhD in Pharmaceutical Sciences at the Faculty of Pharmacy of the University of Alberta. One year of this program was completed at the University of Heidelberg. John continued to explore research and teaching in the area of radiopharmacy and after a year working in industry he returned to the University of Alberta in 1991 as an Associate Professor with a joint appointment in the Faculties of Pharmacy and Medicine. John has had an active teaching program in both the undergraduate and graduate curriculums mainly focused in the area of radiopharmacy. His research program has explored the synthesis and pre-clinical evaluation of imaging and therapeutic radiopharmaceuticals. He has been continuously funded through provincial and federal grants and has more than 55 peer reviewed publications. John is presently an Associate Professor in the Faculty of Medicine and has moved full time to Oncologic Imaging at the Cross Cancer Institute where he holds the position of Research Director at the Edmonton PET Center while maintaining an adjunct position in the Faculty of Pharmacy. Major teaching developments include designing extensive resources for radiopharmaceutical sciences teaching and participation in international initiatives for distance education, most recently the VirRAD program.

AFPC/ASTRAZENECA NEW INVESTIGATOR RESEARCH AWARD

Christine Allen, PhD, Assistant Professor, Leslie Dan Faculty of Pharmacy, University of Toronto.

Christine has been an Assistant Professor since 2002. She is cross-appointed in the Departments of Chemistry and Chemical Engineering and Applied Chemistry. Her research is focused on the rational design and development of new materials and technologies for the delivery of drugs and contrast agents. She completed her doctoral research at McGill University in the Department of Chemistry (June 2000), focusing on the physico-chemical characterization of block copolymer micelles for applications in drug delivery (McGill University, Quebec). Following her PhD she was awarded NSERC and Killam postdoctoral fellowships which she used to pursue research on both polymer (Faculty of Pharmaceutical Sciences, UBC) and lipid-based (Department of Advanced Therapeutics, B.C. Cancer Agency.) drug delivery systems for cancer treatment. She joined the Faculty from Celator Technologies Inc. of Vancouver, a company that grew out of the B.C. Cancer Agency, where she worked as the Assistant Director of Materials Research. She has numerous publications, patent applications, review articles and book chapters on both lipid and polymer-based delivery systems. In 2004, she was awarded a CIHR-Rx&D Career Award for her research on the design and development of technologies for cancer treatments.

Engineering Advanced Polymer and Lipid-Based Nanotechnology for Cancer Detection and Therapy

Over the past few years there has been a dramatic increase in the development of powerful imaging methods for the non-invasive characterization of normal and diseased sites such as cancerous tumors. In addition, a range of novel highly potent anti-cancer agents have emerged through efforts in medicinal chemistry as well as genomics and proteomics. However, these discoveries have not yet translated into the same degree of improvement in terms of the prognosis and clinical outcomes associated with cancer. One of the central limitations preventing full exploitation of these developments is the inability to selectively deliver contrast or therapeutic agents to the diseased sites while avoiding healthy tissue. For this reason, our laboratory is focused on the development of advanced polymer and lipid-based nanotechnology that can deliver sufficient quantities of contrast agent or drugs to specific biological sites. Specifically, we have designed a multi-modal agent that provides contrast enhancement in two distinct imaging modalities, namely, magnetic resonance (MR) and computed tomography (CT). The stability, pharmacokinetics and biodistribution of this multi-modal agent in both mice and rabbits have been fully characterized. Importantly, the multi-modal agent was found to provide visual contrast enhancement and measurable signal increase in the heart and major blood vessels of the animals in both CT and MR for periods of up to 72 hours (3 days) following administration. Due to the prolonged residence time in blood this agent is ideal for vascular imaging and pursuit of active targeting applications such as characterization of diseased sites (e.g. tumors). In a separate series of studies we have designed a novel polymeric delivery system that localizes preferentially in the nucleus of EGFR over-expressing breast cancer cells. This vehicle is now being characterized *in vivo* and will be explored for the delivery of hydrophobic drugs to EGFR over-expressing cancers such as breast, prostate and lung. Therefore, efforts in our laboratory are focused on the design of nanotechnology as an enabling technology that will allow the recent advancements in cancer biology, imaging technology and drug discovery to be fully exploited and result in improved outcomes and survival rates for cancer patients.

AFPC/GLAXOSMITHKLINE GRADUATE STUDENT RESEARCH AWARD

Lichuan Liu, MD, PhD candidate, Department of Pharmaceutical Sciences, Leslie Dan Faculty of Pharmacy University of Toronto.

Lichuan Liu graduated from the Faculty of Medicine, Tianjin Medical University, China in 1994 and has worked as a surgeon in the Department of Hepatobiliary Surgery, Tianjin Third Central Hospital for 4 years. In 1999, he went to the United States and studied molecular pathogenesis of hepatopulmonary syndrome as a postdoc fellow in the Liver Center, University of Alabama at Birmingham. In 2001, Lichuan immigrated to Canada with his family and first worked as a postdoc fellow then transfered to a PhD student in Dr. K. Sandy Pang's lab, Department of Pharmaceutical Sciences, University of Toronto. His research interests mainly focus on the drug disposition in the liver and he is currently involved in the study of drug disposition in a metastatic liver tumor model. Since becoming a PhD student, Lichuan has received several awards, which include University of Toronto Open Fellowship, Ontario Graduate Scholarship (OGS), AAPS/PPDM travel award and AFPC/Canadian Foundation for Pharmacy National Student Poster Award.

Vascular Binding, Blood Flow, Transporter and Enzyme Interactions on the Processing of Digoxin in Rat Liver, *Lichuan Liu*, Ernie Mak, Rommel G. Tirona, Eugene Tan, Phyllis M. Novikoff, Pijun Wang, Allan W. Wolkoff, and K. Sandy Pang, The Journal of Pharmacology and Experimental Therapeutics 315:433-448, 2005.

The roles of transporters and enzymes as determinants of the clearance of digoxin were examined in the rat liver. Digoxin is metabolized by Cyp3a and utilizes the organic anion transporting polypeptide 2 and P-glycoprotein for influx and excretion, respectively. Uptake of digoxin was found to be similar among rat periportal (PP) and perivenous (PV) hepatocytes isolated by the digitonin-collagenase method. The KBmB's for uptake were 180 ± 112 and 390 ± 406 nM, the VBmaxB's were 13 ± 8 and 18 ± 4.9 pmol/min/mg protein, and the nonsaturable components were 9.2 ± 1.3 and 10.7 ± 2.5 l/min/mg for PP and PV, respectively. The evenness of distribution of Oatp2 was confirmed by Western blotting and confocal immunofluorescent microscopy. When digoxin was recirculated to the rat liver preparation in Krebs Henseleit buffer (KHB) for three hours in absence or presence of 1% bovine serum albumin (BSA) and 20% red blood cell (rbc) at flow rates of 40 and 10 ml/min, respectively, biexponential decays were observed. Fitted results based on compartmental analyses revealed a higher clearance (0.244 ± 0.082 ml/min/g) for KHB-perfused livers over the rbc-alb-perfused livers (0.114 ± 0.057 ml/min/g) ($P < 0.05$). We further found that binding of digoxin to 1% BSA was modest (unbound fractionB B= 0.64), whereas binding to rbc was associated with slow on (0.468 ± 0.021 min^{-1}) and off (1.81 ± 0.12 min^{-1}) rate constants. We then utilized a zonal, physiologically-based pharmacokinetic model to show that the difference in digoxin clearance was attributed to binding to BSA and rbc and not to the difference in flow rate, and that clearance was unaffected by transporter or enzyme heterogeneity.

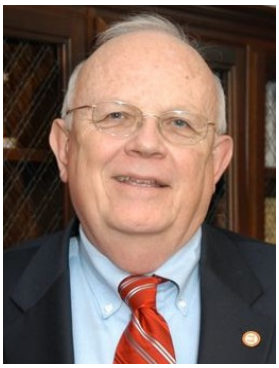
AFPC/PFIZER RESEARCH CAREER AWARD

Helen Burt, PhD, Angiotech Professor of Drug Delivery, Associate Dean, Research and Graduate Studies, Faculty of Pharmaceutical Sciences, University of British Columbia

Dr Burt obtained her B. Pharm.(Hons) in 1975 from the University of Bath, U.K. and her PhD in Pharmaceutics in 1980 from the University of British Columbia. Her major research efforts involve the development of polymer-based drug delivery systems for controlled and localized drug delivery and in the synthesis and evaluation of new biodegradable polymers as suitable biomaterials or carriers for drugs. She has published over 90 peer-reviewed papers and has several patents. Her work is currently supported by grants from the Canadian Institutes of Health Research (CIHR), the National Cancer Institute of Canada and by a BC pharmaceutical company. She recently completed a 3-year term as the Health Research Coordinator in the Vice President Research Office at UBC. Dr Burt was awarded the YWCA Woman of Distinction Award for Science, Research and Technology in 2000. She is a member of the Canadian Academy of Health Sciences, the Board of Directors of the Provincial Health Services Authority and the Research Advisory Committee of the Michael Smith Foundation for Health Research.

Abstract: "Arthritis, binding agents and controlled release: a research career or alphabet soup?"
Helen M. Burt, PhD, Angiotech Professor of Drug Delivery, Faculty of Pharmaceutical Sciences, University of British Columbia, Vancouver, BC, V6T 1Z3.
The search for a unifying theme to 26 years of research contributions has led me to conclude that my research programs have been rather diverse in nature. However, it is possible to describe a major focus area as that of solid-state pharmaceutics and the characterization of solid materials. The range of solid materials investigated has spanned inflammatory crystals that deposit in joints and give rise to arthritis, ion-exchange resins as potential phosphate binding agents for dialysis patients and polymer/drug combinations for controlled release drug delivery systems used in a variety of applications. A brief overview of work involving the elucidation of neutrophil activation and responses to stimulation by inflammatory microcrystals and the development of anion exchange phosphate binding resins will be provided. Studies in which we designed, developed and characterized paclitaxel loaded polymeric, controlled release delivery systems for applications in restenosis, cancer, arthritis and postsurgical adhesions will be described.

Dick R. Gourley, BS, Pharm.D., Dean, College of Pharmacy, University of Tennessee.



Dean Gourley received his BS (1969) and Pharm.D. (1970) degrees from The University of Tennessee College of Pharmacy. His teaching career began at Mercer University, Atlanta as Assistant Professor of Clinical Pharmacy. From 1972-1984, he was at the University of Nebraska Medical Center as founding Chair, Department of Clinical Pharmacy. He completed the certificate program in Health Systems Management at Harvard University Schools of Public Health, Business, and Medicine (1980). In December 1984, he became Dean of the Southern School of Pharmacy, Mercer University. In April 1987, he became the Provost for the Atlanta campus, as well as maintaining the Dean of Pharmacy position. Dr. Gourley became Dean of Pharmacy at The University of Tennessee Health Science Center in December 1989. Administratively responsible for all academic, research and service programs of the College; teaching at the professional/graduate level; has an active research program; University committee service, and faculty member for the UT's Institute for Leadership Effectiveness. He completed the Certificate Program in Higher Education Administration at the Harvard Graduate School of Education in July 2001. He has published more than 55 manuscripts, edited 26 proceedings, co-edited 8 textbooks and 6 workbooks, and presented more than 225 lectures at state, national, and international meetings. He is the co-editor of the 7th Edition of the Textbook of Therapeutics: Drug and Disease Management and Editor-in-Chief of the APhA's Comprehensive Review of Pharmacy (now in its 3rd Edition). UT's College of Pharmacy is ranked 17th by ***U.S. News and World Reports***.

Abstract: "Preparing a College of Pharmacy for the Future: A Case Study", Dick R. Gourley, Pharm.D., Professor and Dean University of Tennessee College of Pharmacy, 847 Monroe Avenue, Suite 226, Memphis, TN 38103

This presentation identifies external factors affecting pharmacy in the United States and in many other countries as well. These factors include but are not limited to the changes in pharmacy education accreditation standards, health care facilities changes, financing of higher education, development of new technologies, public awareness of standards for health care professionals and facilities performance, government reports such is the Institute of Medicine report on To Err is Human, the need for changing the health care workforce, the shortage of health care educators as well as the shortage of practitioners, roles of pharmacists in the future. External factors also include globalization of health care which does affect pharmacy education in terms of workforce and educational needs. Program participants are asked to identify factors affecting Canadian Pharmacy Education based on their perspective.

A case study is presented which focuses on the University of Tennessee's college of pharmacy's response to many of these external factors. Functions of pharmacist now and in the future are addressed in the changes at UT. Changes in curriculum, faculty size and distribution, size of the entering class and the student affairs issues such as student values, professionalization, and student services faced with this rapid and large expansion. The economic impact of the UT College of Pharmacy on the local community as well as the state is presented as well. Funding of higher education is also addressed. The issues related to economics cannot be ignored as we move further into the future. Program participants are asked to identify those factors (external and internal) which are affecting pharmacy education in Canada.

Bill Bartle, BSc Phm, Pharm D, FCSHP:

Bill is presently Clinical Coordinator, Dept. of Pharmacy, Associate Director, Anti-Coagulation Clinic, and member of the Thrombo-embolism Service, Sunnybrook Health Sciences Centre, and Associate Professor of Clinical Pharmacy, University of Toronto. He has taught undergraduate pharmacy students, PharmD students, and medical students and residents in the classroom and "at the bedside" for over 30 years in the area of pharmacotherapeutics. His research interests include clinical drug interactions, anticoagulation management, gastro-intestinal therapeutics, and quality of patient drug information. Dr. Bartle was the 2002 recipient of the Wm. McLean Clinical Pharmacist Award from the Ontario Branch, CSHP, and the 2005 Distinguished Service Award recipient from CSHP.

Abstract:

Graduating A More Confident Pharmacy Pharmacist (Can. J. Hosp. Pharm., June 2005)

My thirty plus years of participating in pharmacy and medical trainee clinical education has provided me with a unique perspective on how our respective faculties teach and, more importantly, train their prospective graduates. Medicine introduces their students to patients in the first year and quickly gives them some responsibility in taking histories and doing physical exams. This progresses over the next 2 undergraduate years in more responsibility of managing the patients care under supervision and acquiring clinical knowledge; the medical student then must complete a minimum of 2 years post-graduate training in patient care. Imbedded in all this formal organized training is the "hidden curriculum" of constant small group, or one-on-one discussions of other interesting cases, general health system, career, ethical and 'life' issues. It is not surprising that this style of curriculum produces a confident medical graduate, with its constant demand of responding to questions and carrying out procedures expected of the student.

Most pharmacy undergraduate curriculi block a majority of their clinical training in the last few months of the final year. So the pharmacy student goes from a mainly classroom setting of passive, low expectant listening to one of clearer demands and expectations of explaining decisions and reasons for drug therapy decisions in their patients. Not surprising, the pharmacy student appears hesitant and unsure in this setting; yet, they are only weeks to months away from graduating. And most of these students will not apply for a residency position that would afford them an opportunity to develop some confidence. Although we constantly emphasize how much more didactic pharmacology teaching our pharmacy students receive in the classroom, this does not seem to translate into a confident application of this knowledge to a specific patient. A pharmacy student may participate in the care of one patient with diabetes, for example, while the medical student will take on dozens of patients with diabetes and hear about many other diabetic patients taken care of by their team or staff physician.

The lack of clinical training of the pharmacy student does not allow them to take on the responsibility of important aspects of (pharmaceutical) patient care that would assist a hospital pharmacy department lacking in sufficient human resources to provide the level of pharmaceutical care desired by the profession.

Regardless if we do or do not move to an Entry-Level Pharm D program, I cannot over-emphasize how important it is to move as quickly as possible towards a medical model of teaching/training to produce a more confident graduate who may then be able and willing to accept more responsibility that the health care system is grudgingly trying to turn over to the profession.

Claude Mailhot, Professor and Associate-Dean for Academic Affairs, Faculté de pharmacie de l'Université de Montréal.

Dr. Mailhot obtained her bachelor and hospital pharmacy degrees from the Université de Montreal. She completed her Pharm.D. and residency in clinical pharmacy at the University of Utah. Dr. Mailhot has been actively involved in the development of the clinical section at the Faculty including course development and resource selection & allocation since 1985. She instituted several activities aimed at developing professionalism in undergraduate students. She led all Pharm.D. related committees since 2000 from early assessment of relevance and feasibility to implementation planning. She received several teaching awards at the Faculty and national level. In 2005, she received an Honoris Causa doctorate from the University of Amiens (France) for her involvement in clinical pharmacy development. She is actually president of the evaluation committee of the international association of francophone faculties of pharmacy.

Abstract: Development of the Entry-level Pharm.D. Degree at the University of Montreal. Claude Mailhot, Pierre Moreau, Chantal Pharand, Johanne Vinet, Françoise Crevier, Faculté de pharmacie, Université de Montréal. Québec.

The Faculty of pharmacy has evaluated the relevance of modifying its program towards an entry-level Pharm.D. based on the following factors: unmet population needs for services related to drug use, needs that are expected to increase in the future; and emphasis on prevention and health promotion, leading pharmacists to play a more active role in "first contact" services. With the recent modifications to the definition of the "practice of pharmacy" in the Quebec "Pharmacy Act", the pharmacist "supervises medication therapy" and "initiates or adjusts medication therapy according to a prescription", thus becoming increasingly responsible for pharmacotherapeutic outcomes. Interdisciplinary activities require the pharmacist to have excellent knowledge of the health care system and to have the required skills to intervene effectively with other health professionals. The aforementioned factors support a thorough and complete review of the pharmacy curriculum. We believe major program modifications, including integrating significant experiential learning experiences throughout the curriculum, justifies a change in the degree awarded to that of Pharm.D. The outstanding collaboration of professors, pharmacists, professionals, students and pedagogy consultants resulted in a proposal for the transformation of the program which includes major changes in teaching and clerkships. The new program emphasizes competency development and integration of knowledge from different disciplines using problem solving activities and active learning approaches. Clerkships are more structured, occur earlier and are better prepared with an increase in practice laboratory activities. The actual Baccalaureate program includes 142 credits over 4 years (over 8 trimesters) with 14 credits of clerkships. The Baccalaureate does not confer practice privileges and students must complete additional externship and internship hours under the Board of Pharmacy supervision to obtain practice privileges. The proposed Pharm.D. program increases: 1) the credit load from 142 to 164 (over 9 trimesters) and 2) the clerkships credits from 14 to 40. The Pharm.D. degree will be recognized by the Board of Pharmacy and graduates will have immediate practice privileges. For hospital practice, the Master degree in Pharmacy practice (Hospital) will be maintained.

Gilles Leclerc, B. Pharm., Coordinator, Experiential program, Faculté de pharmacie, Université de Montréal

Obtaining his degree in 1989 from the University of Montreal (UM), Gilles practiced pharmacy mainly in a hospital setting for nearly a decade. While managing the Richardson Hospital Center pharmacy services, he joined in 1996 the UM undergraduate pharmacy clerkship program as a preceptor. Returning in October 1999 full time to his Alma Mater as experiential program coordinator; he was involved almost entirely in both undergraduate and postgraduate clerkship sites management, preceptor training and program development. He contributed actively to the AFPC Experiential Task force. In recent years, he drove the feasibility studies that led to the design of the first Canadian entry-level Pharm. D. clerkship program. His present goal is to assure a smooth implementation and transition toward the new clerkship program in both community and hospital settings. His enthusiasm for the use of technologies in education and authentic assessment, has also led him to the development of an online program management system to support the educational outcomes of a competency-based curriculum.

Abstract: Dealing with the Challenges of the Expanded Experiential Program,
Implementing an expanded experiential program raises multiple challenges. Based on the University of Montreal experience, this presentation will expose what changes were introduced and how educational and organizational issues were managed in order to successfully implement the expanded experiential program. Aiming to inform, rally and meet expectations of stakeholders, service providers, and preceptors, a collaborative management approach was put in place targeting issues of program and clerkship design, implementation and transition; preceptorship management, training and recognition; and experiential sites management and accreditation. Dealing with the pharmacist shortage, a decreased motivation for undergraduate experiential and an evolving practice environment is unavoidable. Resource availability appears to be a key component for managing this important change.

John M. Seubert, MSc., PhD, Assistant Professor, Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta.

Dr. Seubert received his Bachelor of Science (1992) in Biology and Master of Science in Environmental Toxicology from Simon Fraser University (1997). From 1992 to 1997, he worked as a forest fire fighter for the in British Columbia, Canada. He then obtained a Doctor of Philosophy in Pharmacology and Toxicology from the University of Western Ontario in 2002. Part of the work from his doctoral thesis investigated the role of bilirubin in cellular death and the modulation of the cytochrome P450 (CYP) monooxygenase system (P450). This research demonstrated bilirubin-mediated cell death was apoptotic, involved reactive oxygen species (ROS) production and the aryl hydrocarbon receptor (AHR) signaling pathway. He completed a postdoctoral fellowship in cardiovascular pharmacology with Dr. Darryl Zeldin at the National Institutes of Environmental Health Sciences, NIH in Research Triangle Park, North Carolina (2005). His worked focused on studying the roles of the cytochrome P450 system in cardiac function and protection.
Dr. Seubert's teaching and research interests include mechanisms of cellular injury and protection, roles of the cytochrome P450 system in vascular and cardiac function and regulation of the cytochrome P450 system following pathobiological stress. His research is currently supported by the Canadian Institutes of Health Research (CHIR) and the Heart and Stroke Foundation.

Scot H. Simpson, B.S.P., Pharm.D., M.Sc. Assistant Professor, Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta.

Dr. Simpson received his Bachelor of Science in Pharmacy from the University of Saskatchewan in 1990 and completed a hospital pharmacy residency at the Regina General Hospital in 1991. He then worked as a staff pharmacist at the Yorkton Regional Hospital in Yorkton, Saskatchewan for three years. He obtained a Doctor of Pharmacy degree from the University of Toronto in 1997 and completed a combined post-doctoral fellowship (2000) and a Master of Science degree (2001) in the Faculty of Medicine and Dentistry, at the University of Alberta. Currently, Dr. Simpson is an Assistant Professor in the Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta and a clinical pharmacist with the Family Medicine Clinic at the University of Alberta Hospital. Dr. Simpson is a New Investigator supported by the Canadian Institutes of Health Research (CIHR), a Fellow of the Institute of Health Economics, a collaborator with the Alliance for Canadian Health Outcomes Research in Diabetes (ACHORD) in Edmonton, Alberta, and a member of the expert committee for the Canadian Diabetes Association Clinical Practice Guidelines.

Dr. Simpson's teaching and clinical practice interests are in medication management of diabetes and its complications, medication adherence issues, and the challenges of integrating evidence into practice. He has actively participated in a number of pharmacy practices and health services research studies. He has a published interest in evaluating the impact of medication adherence on health outcomes, identifying and overcoming patient-perceived barriers to medication use, and optimizing medication management of diabetes and cardiovascular disease.

Abstract: The Synergy of Science and Practice, John Seubert PhD and Scot Simpson, BSP, Pharm D, MSc, Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta Faculties with basic science and clinical practice divisions often have researchers interested in parallel fields of study. Separately, these research streams have important contributions to their respective areas. Although the focus of specific studies may appear different on the surface, collaboration can yield important insights into each others' work. Apparent gaps in one area could actually be common knowledge or resolved from research activity in the other. It is through this synergistic collaboration that we become better clinicians and scientists. Our presentation will use the example of research involving ATP-dependent potassium channels to illustrate how two separate lines of research can be complementary. From the clinical practice perspective, we were pursuing a research hypothesis that sulfonylureas may have a detrimental, cardiotoxic, effect for people with type 2 diabetes. From the basic research side we are looking at the role of these channels in eicosanoid-mediated cardioprotection against ischemia reperfusion injury. Consultation identified that the suspected mechanism – blockade of the ATP-dependent potassium channel resulting in prevention of cardioprotection – was indeed plausible. Together, these separate studies provide an example of how we can translate research from the bench to the bedside benefiting the patient management and overall research.

Monique Richer, Pharm.D., M.A. (ed), Dean, Faculty of Pharmacy, Université Laval

Dr. Richer received her Bachelor of Pharmacy degree from l'Université de Montréal and her Doctor of Pharmacy degree from the University of Texas at Austin. She completed a residency in hospital pharmacy at the Ottawa General Hospital as well as post-graduate residency in pediatrics from the University of Texas Health Science Center at San Antonio. She received a Medical Research Council/Health Research Foundation post-doctoral award to complete her studies at l'University Laval. She holds a Masters in Health Sciences Education and is a law student.
Dr Richer has been a professor of pharmacotherapy at the Faculty of pharmacy at l'Université Laval since 1995 and Dean since 2001. She has held positions on the Pharmacy Examining Board of Canada and the Canadian Council for Accreditation of Pharmacy Programs. She is also an administrator of l'Ordre des pharmaciens du Québec. She was recently named as one of the ten most influential pharmacists in Quebec as well as "Pharmacist of Merit".

Abstract: Developing and implementing an entry-level competency-based doctor of pharmacy program: The Laval experience
With the entry-level doctor of pharmacy program set to begin in 2008, the *Faculté de pharmacie de l'Université Laval* is presently developing a competency-based program. Various committees composed of pharmacists, faculty, students and pedagogy experts are involved in this process. We are now completing the third of seven modules, the competencies module. The development of the fourth module, the structure of the program, will begin in May 2006.

Five competencies have been identified as well as families of situations that a pharmacist is likely to encounter during his or her practice. In addition, four blocks of activities for each competency and family of situations have been defined. These blocks do not necessarily represent an academic year in the 4-year program.

Determining the structure of the program involves identifying the knowledge, the skills as well as the particular situations that are likely to be encountered by the practicing pharmacist. The various levels at which each of the competencies must be attained vary from block to block. The evaluation process is being developed simultaneously. In addition, the committees are also considering innovative ways to deliver the structured practical experience (interactive educational methods, pharmaceutical skills laboratory, PIVEP).

Nancy Waite, Pharm D, FCCP, Associate Professor, Leslie Dan Faculty of Pharmacy, University of Toronto.

Through various academic and clinical positions in Canada and the United States, Nancy has experience providing clinical pharmacy services in ambulatory care practice settings, teaching student, patient and health care professional audiences, conducting pharmacy practice research and taking academic managerial responsibilities. She has implemented active learning strategies in both small and large classrooms and developed several abilities based courses. Participating and leading curricular reform to meet changing health care needs and advancing pharmacy practice through innovative programs have been two of her key responsibilities over the last 10 years. This experience led to her current position where she coordinates the development of a plan for implementation of an entry-level Pharm D program at the Leslie Dan Faculty of Pharmacy. She has received the Educator of the Year Award from the New York State Chapter of the American College of Clinical Pharmacy and Professor of the Year Award at the Leslie Dan Faculty of Pharmacy, University of Toronto.

Abstract: A Plan for Implementation of the Entry-level Pharm D at the University of Toronto:
The Leslie Dan Faculty of Pharmacy at University of Toronto is committed to providing high quality educational opportunities that produce pharmacy graduates who can meet the pharmacy-related health care needs of Ontario residents. After consultation with stakeholders, an external review of our current programs and discussions with professional organizations and individuals, a decision was made to develop an entry-level PharmD (ELPD) program that will set global benchmarks and one that will complement our BScPhm degree. The current ELPD proposal is to admit a small class size (40-60) and maintain a BScPhm program. The curriculum is designed to graduate a generalist pharmacy practitioner with enhanced competencies in interprofessional practice, primary care, patient safety, understanding of diversity issues as they relate to pharmacy practice, knowledge mobilization, public health (including health promotion) and providing education. An update on the plan for implementation of the ELPD will be provided and will include the process used to gather feedback from stakeholders, comparative definitions of graduates from our pharmacy programs, and details of key curricular features such as the elective pathway and extensive experiential component. Preliminary plans for advanced training programs for ELPD graduates and an upgrading program for BScPhm graduates will be discussed.

Sharon Mitchell, PhD., Clinical Associate Professor and Assistant Dean, Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta

Sharon Mitchell received her BSc. Pharm. from the University of Toronto in 1975 and completed a hospital residency with the University of Toronto. Sharon worked as a clinical pharmacist in London, Ontario from 1975 to 1986 when she joined the Faculty of Pharmacy at the University of Alberta. Sharon received a Masters of Clinical Pharmacy in 1989 and an Interdisciplinary PhD in Medicine and Pharmacy in 2005 from the University of Alberta. Her research interests include antibiotic resistance and infectious diseases. She teaches antimicrobial agents and infectious diseases at the Faculty of Pharmacy where she received the Bristol Myers Squibb teacher of the year award in 2004. Sharon is involved in curriculum development and has served as the Chair of the Division of Pharmacy Practice. Sharon has been involved as a founding member of the executive committee of the "Do Bugs Need Drugs?" Project since 1997. For her work in this area, she received the Dare to Care Award form Grant MacEwan College in "recognition of her outstanding contribution to healthcare education". Sharon is currently in charge of the development of the Entry-Level Pharm D program in the Faculty of Pharmacy and Pharmaceutical Sciences.

Abstract: Extensive evaluation of our curriculum was initiated in 1993. In 1994, a Faculty retreat with major Stakeholders provided 2 major recommendations: Improve and increase clinical experience, and integrate information using a disease-state, modular approach. The curriculum designed consisted of 2 years pre-pharmacy, 3 years of integrated courses (modules) and 1 year experiential learning in addition to an early introduction to experiential in first year. The degree granted would be the Entry-Level Pharm D. Due to concerns regarding clinical training sites, the decision was made to implement an integrated "modular" B.Sc. curriculum with the development of a gradual phased-in Entry-level Pharm D. This phased-in approach would support the development of experiential sites with the training of Entry-Level Pharm D practitioners. This plan was supported unanimously by the Alberta Pharmacists' Association in February 2000 and by the Faculty in May 2000. An integrated "modular" curriculum was initiated in September 2004, with students entering the 3rd year of the new curriculum this September. Work has begun on the development of the Entry-Level Pharm D. The first step taken was the development Outcomes for the Entry-Level Pharm D. When AFPC began the development of Educational Outcomes for the Entry-Level Pharm D, we joined forces. The AFPC Educational Outcomes for the Entry–Level Pharm D were accepted unanimously by our Faculty in February 2006. Work has begun to outline the experiential program for the Entry-Level Pharm D. We currently propose 48 weeks of clinical rotations beginning in the second term of the 4th year. The fall term of the 4th year will focus on coursework to improve clinical skills including advanced therapeutics, pharmaceutical care, research design and evidence based medicine.

Jake J. Thiessen, Professor, Leslie Dan Faculty of Pharmacy, University of Toronto, and Hallman Director, School of Pharmacy, University of Waterloo, Ontario

Jake Thiessen earned his undergraduate Pharmacy degree from University of Manitoba and his doctoral degree from the University of California, San Francisco, California. Jake has been at the Faculty of Pharmacy, University of Toronto for about 33 years. He has taught pharmacokinetics at the undergraduate and graduate levels. His current research interests include the pharmacokinetics and pharmacodynamics of cancer chemotherapeutic agents, identifying new cancer treatment strategies, and defining the kinetics and response to iron chelators. Following a period as associate dean in Toronto, he was invited in the fall of 2004 to become the founding director of the new University of Waterloo School of Pharmacy. Among his extra-university involvements, Jake has chaired the Ontario Ministry of Health Drug Quality and Therapeutics Committee and served on the Pharmaceutical Inquiry of Ontario. He continues to chair the Health Canada Scientific Advisory Committee on Bioavailability and Bioequivalence, and has served as President and Past-President of the Canadian Council for Accreditation of Pharmacy Programs.

Abstract: The New School of Pharmacy, University of Waterloo.
Jake J. Thiessen, Hallman Director, School of Pharmacy, University of Waterloo, Waterloo, Canada

The dream for a new School of Pharmacy at the University of Waterloo can be traced to the mid 1980's when people in the Faculty of Science began to ask how they could raise the profile of their biomedical and health research. The tangible realization of this dream unfolded most recently through an extraordinary development within the City of Kitchener, the University of Waterloo, and other institutions, including the Leslie Dan Faculty of Pharmacy. This presentation will 1) outline the beginning of the new School; 2) identify the challenges/opportunities of forming such a School within a university that is noted for engineering, mathematics and computer science; 3) present the fundamental business model including projected faculty and student complements; 4) spell out the intended educational developments that include delivering the experiential component through co-op learning; 5) state the ambitions in healthcare as expressed through the establishment of a primary care institute; 6) identify the research initiatives; 7) set out the special opportunities accompanying the announced satellite medical program; 8) present the timelines for the School's development.

Preparing Pharmacists for the Future

AFPC Annual Conference

June 2 - 4, 2006 Shaw Conference Centre and Fairmont Hotel Macdonald, Edmonton, Alberta

and

Feel the Energy - Edmonton

CPhA Annual Conference

June 3 - 6, 2006 Shaw Conference Centre and The Westin Edmonton, Edmonton, Alberta

Abstract Compendium

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9:00-9:15	Exploring elderly patients' perceptions about strategies to improve adherence to medications: a qualitative study	*Lau E*, Papaioannou A, Dolovich L, Raina P, Burns S, Nair K, Emili A, Kennedy C	46
9:15-9:30	Integration of web-based continuing pharmacy education modules into an undergraduate pharmacy therapeutics course	*Wiens CA*, Schindel T, Varnhagen S, Ackman ML, George-Phillips KL, Tsuyuki, RT	47
9:30-9:45	Accuracy and quality of Warfarin patient information	Diamantouros A, *Bartle B,* Geerts W, Kim L	48
9:45-10:00	Perceptions of pharmacist and family physician contributions to medication-related processes: changes over time as pharmacists integrated into family practice	*Farrell B*, Woodend K, Pottie K, Yao V, Dolovich L, Kennie N, Sellors C	48
10:00-10:15	Addressing the hospital pharmacy management crisis: Development of strategies & solutions	*MacKinnon NJ*, Black EK, Roy M, Vaillancourt R, Bowles SK, Thompson A	49
10:15-10:30	Evaluation of the impact of teletriage pharmacists on patients; decision-making and healthcare resource utilization	*Tscheng D*, Gavura S, Ho C, Cheung T	50
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11:00-11:15	Primary care intervention and education in diabetes: a pharmacist coordinated comparison of usual care versus collaborative primary care in affecting diabetes control and quality of life	*Rosin J*, Townsend, K	51
11:15-11:30	Community pharmacy patient safety and quality improvement pilot project	*DeVos L*, Lopatka H, Ontkean S	51
11:30-11:45	An interdisciplinary medication management program for seniors in the community	*Waite N,* MacKeigan L, Chan D, Wichman K, Applebaum R, VanderBent S	52

J. Villeneuve, J. Genest, D. Lamarre, M.C. Vanier, M.T. Lussier, E. Hudon, L. Blais, S. Perreault, L. Lalonde

Background In Quebec, pharmacists may initiate and adjust drug therapy in accordance with a prescription and request laboratory analyses when needed. In an eight-hour interactive dyslipidemia management workshop, treatment guidelines, pharmacotherapy management, treatment protocol and specific clinical tools were presented.
Aim To assess the impact of the TEAM workshop on pharmacists' knowledge.
Method In a cluster randomized controlled trial, 15 clusters involving 77 physicians and 104 pharmacists were randomized to the usual care (UC) or pharmacist's management care (PMC) groups. 95% of PMC pharmacists (n=58) attended the workshop. UC and PMC pharmacists (n=104) completed a knowledge questionnaire at entrance into the study and PMC pharmacists completed the same questionnaire after the workshop (n=58). Overall and specific knowledge scores were compared at baseline across the study groups (T-test). Changes in knowledge before and after the workshop were measured (paired T-test).
Results At baseline the mean overall knowledge score was equal to 45.2% and 45.8% (p=0.8) in the UC and PMC group, respectively. Specific knowledge scores were low in both groups; treatment guidelines knowledge (UC: 61.6%, PMC: 63.1%; p=0.7) and pharmacotherapy management knowledge (UC: 39.5%, PMC: 40.0%; p=0.8). After the workshop, the mean overall PMC pharmacists' knowledge score improved from 45.8% to 89.0% (p<0.0001). Specific knowledge scores also improved: treatment guidelines (63.1% and 94.4%; p<0.0001) and pharmacotherapy management (40.0% and 85.2%; p<0.0001).
Implication for pharmacists TEAM workshop significantly improves community pharmacists' knowledge on treatment guidelines and pharmacotherapy management. These results suggest that adequate training is relevant prior to implementing a pharmacist's management care program.

EXPLORING ELDERLY PATIENTS' PERCEPTIONS ABOUT STRATEGIES TO IMPROVE ADHERENCE TO MEDICATIONS: A QUALITATIVE STUDY

E. Lau, A. Papaioannou, L. Dolovich, P. Raina, S. Burns, K. Nair, A. Emili, C. Kennedy

Background Medication non-adherence is an increasing problem that can lead to sub-optimal control of chronic conditions. Elderly patients are considered at high risk for medication nonadherence due to their need for multiple medications and co-morbid conditions, with reported adherence rates ranging from 26% to 59%. Recent studies have shown that interventions to improve medication adherence are not always effective although the reasons for this are unclear.
Aim To explore the experiences, perceptions, and expectations of elderly patients regarding strategies used to improve medication adherence.
Method This study used qualitative methods. Patients 65 years of age or older who were taking 2 or more prescription medications were recruited from family physician practices and community pharmacies in Hamilton, Ontario to participate in focus groups. A semi-structured interview guide was used with questions that explored the importance of adherence, facilitators and barriers to adherence, and usefulness of strategies for improving adherence. Focus group sessions were digitally recorded and transcribed verbatim. Data analysis of primary themes was conducted by 2 research team members independently and in duplicate.

Results Forty-two participants attended 1 of 7 focus groups. The mean age of participants was
73.7 (SD 6.0) years, 55% were female, and the mean number of medications taken was 6.1 (SD 2.9). Facilitators to adherence included having trust in the physician, feeling comfortable discussing medications with healthcare providers, awareness of the consequences of not taking medication, and accepting responsibility for one's health. Barriers to adherence included having a negative perception of medication-taking, feeling overmedicated, fear of long-term side effects, lack of support from healthcare providers, and receiving conflicting information about medications. The main adherence strategies patients used were medication organizers, integrating medication-taking into their daily routine, and consulting with their physicians when they encountered side effects.
Implications for pharmacists There were a wide range of barriers and facilitators that influenced elderly patients' medication adherence. As front-line healthcare providers, pharmacists are well positioned to identify patients who are at risk for medication non-adherence. By understanding the reasons for non-adherence from the patient's perspective and the types of strategies patients use for medication-taking, pharmacists can implement more effective interventions to improve medication adherence.

INTEGRATION OF WEB-BASED CONTINUING PHARMACY EDUCATION MODULES INTO AN UNDERGRADUATE PHARMACY THERAPEUTICS COURSE

C.A. Wiens, T. Schindel, S. Varnhagen, M.L. Ackman, K.L. George-Phillips, R.T. Tsuyuki

Background The objectives of this project were to evaluate students' experience and the process of integrating a web-based module in an undergraduate course.
Methods Two web-based modules developed for practicing pharmacists were incorporated into the undergraduate pharmacy therapeutics course for 6 years (2000-2003 PHARMA*Learn* Cholesterol, 2004-2005 PHARMA*Learn* Anticoagulation). The evaluation method was a pre and post questionnaire. Data was analyzed using SPSS and nVivo.
Results Each year there were between 99-121 students enrolled in the course. The students were, on average, in their early to mid-20's, with the majority being female. The overall impression of the program was consistently positive. The majority of students reported an improvement in their attitude toward web-based learning, and increased confidence making drug therapy decisions. Themes arising from the qualitative analysis were: students felt a lack of interaction with the instructor, a desire for printed materials, and a perception that they did not receive value for their tuition because there were no lectures. Processes for integration of a web-based module in an undergraduate course were identified.
Conclusions This study indicates that a web-based module can be successfully incorporated into an undergraduate pharmacy course. Students have positive views of the technology, and the majority of students felt more confident in their knowledge and skills. Challenges for faculty include instructional design for integration, and developing and maintaining the program.

ACCURACY AND QUALITY OF WARFARIN PATIENT INFORMATION

A. Diamantouros, B. Bartle, W. Geerts, L. Kim

Background Adverse patient events post-discharge have been linked to poor communication between patients and practitioners. Warfarin is an important and commonly used drug whose safe management requires clear understanding by the patient on several issues.
Aim This study was conducted to determine the accuracy and quality of warfarin patient information sheets using the consensus of a survey completed by the members of the Thrombosis Interest Group of Canada (TIGC) as a 'gold standard'. The reading level of each information sheet was also assessed and compared against the national literacy level.
Methods Surveys were sent to the 47 members of the TIGC to establish a consensus of items for inclusion in a warfarin education sheet. Patient information sheets representing those distributed by the vast majority of community pharmacies (independent and chain) in Ontario were collected. Their content was evaluated using the checklist and the reading level was assessed using a standardized formula, the Flesch-Kincaid scale.
Results Fifty items were rated as essential or important by at least 2/3 of the 32 TIGC respondents. Analysis of individual information sheets, representing 96% of those distributed in community pharmacies in Ontario, found that on average, the information sheets contained 30 deficiencies (out of 50 essential content elements) as well as a number of incorrect statements. The reading level of these information sheets ranged from a Grade 9 to 12 level as assessed using the Flesch-Kincaid readability scale. The average patient reads at a Grade 6 to 8 level and 25% of Canadians read below a Grade 5 level.
Implications for Pharmacists Based on a 'gold standard', many warfarin patient information sheets fail to address essential patient information and contain deficiencies or incorrect statements that may hinder safe care and lead to unnecessary lifestyle restrictions. In addition, most information sheets are above the average patients' literacy level impeding their comprehension of the material and their ability to utilize the information for improved health. Warfarin patient information sheets need urgent re-drafting using the TIGC warfarin patient information website. Patient drug information sheets require the input of specialists who manage patients on the drug(s) in question.

PERCEPTIONS OF PHARMACIST AND FAMILY PHYSICIAN CONTRIBUTIONS TO MEDICATION-RELATED PROCESSES: CHANGES OVER TIME AS PHARMACISTS INTEGRATED INTO FAMILY PRACTICE

B. Farrell, K. Woodend, K. Pottie, V. Yao, L. Dolovich, N. Kennie, C. Sellors

Background Shared understanding about pharmacists' contribution to medication related processes (MRP) in family practice is important to their successful integration in this environment.
Aim The objective of this study was to measure how different professionals/staff perceived their own and others' contributions to MRP over time as 7 pharmacists integrated into 7 family practice clinics in the Ontario IMPACT (Integrating family Medicine and Pharmacy to Advance primary Care Therapeutics) project.

Methods The 22-item Family Medication Use Processes Matrix (MUPM) with 5 subscales (diagnosis & prescribing, monitoring, administrative & documentation, education and medication review) was mailed to physicians, pharmacists and office staff in 7 sites at the 3rd and 12th month of pharmacist integration. Paired sample T-tests were conducted to determine change over time in each subscale. One-way ANOVA analysis with Tukey's *post-hoc* test was conducted to compare perceptions between occupation groups and change over time.
Results There were 91 surveys (58%) returned at the 3rd month and 85 (54%) at the 12th month. There was a significant increase in the mean score of pharmacist's contribution in the Diagnosis & Prescribing subscale among all respondents ($p<0.01$) and a separate analysis of physicians' responses ($P<0.05$). There was a significant increase in the mean score of the physicians' contribution to the Administration & Documentation subscale ($P<0.05$) from the pharmacists' perspective. ANOVA analysis revealed more consensus among occupation groups in some subscales while other differences persisted over time.
Implications for Pharmacists Changes in perceived contributions of health care professionals to medication-related processes suggest exploration and increased understanding of their own and others' roles. The full effect of pharmacist integration may take longer than one year to perceive clearly. Results of a third round of surveys (at the 18 month point of integration) will also be presented and discussed.

ADDRESSING THE HOSPITAL PHARMACY MANAGEMENT CRISIS: DEVELOPMENT OF STRATEGIES AND SOLUTIONS

N.J. M[ac] Kinnon, E.K. Black, M. Roy, R. Vaillancourt, S.K. Bowles, A. Thompson

Background In recent years, papers have documented the severe shortage of hospital pharmacy directors and the related problems of recruitment and retention, and gaps in the managerial competencies of current hospital pharmacy directors. With pharmaceuticals being the second largest and fasting rising category of healthcare expenditures, and the demand for a safe and effective medication use system, the ramifications of a leadership crisis in hospital pharmacy departments are widespread.
Aim Our aim was to solicit the input of key hospital pharmacy directors across Canada in a workshop format to address the following three questions: 1. What are the best approaches to improving the recruitment and retention of hospital pharmacy directors? 2. Which training/experiential methods are most effective at nurturing the next generation of leaders in hospital pharmacy practice in Canada? 3. How do changing demographics influence the work experiences and expectations of hospital pharmacy directors?
Method Our workshop was held in conjunction with the Annual General Meeting of the Canadian Society of Hospital Pharmacists (CSHP) in August 2005 in an attempt to increase participation. All hospital pharmacy directors attending this meeting were invited to register for the 2 hour workshop. Using the nominal group technique, the participants were divided into three groups, led by facilitators who encouraged quiet idea generation, then round-robin provision of ideas, followed by voting of the preferred strategies and solutions for each of the three questions.
Results The workshop participants felt that the best approaches for improving the recruitment and retention of hospital pharmacy directors included better job descriptions,

adequate staff and resources, and effective mentors from established directors. The training/experiential methods deemed to be the most effective at nurturing the next generation of leaders in hospital pharmacy practice in Canada were mentors and specialized residency programs. Finally, the workshop participants expressed concern that many current managers are approaching retirement and there exists little succession planning in place.
Implications for Pharmacists The results of this workshop have helped to provide, for the first time, a solid foundation upon which this problem can be addressed and should assist in the training of future hospital pharmacy directors.

EVALUATION OF THE IMPACT OF TELETRIAGE PHARMACISTS ON PATIENTS' DECISION-MAKING AND HEALTHCARE RESOURCE UTILIZATION

D. Tscheng, S. Gavura, C. Ho, T. Cheung

Background Four teletriage programs in Canada utilize pharmacists to provide medication information. There is little published information evaluating the impact of pharmacists to support appropriate health resource utilization. A drug information service providing telehealth services sought to evaluate the effectiveness of pharmacists in this setting.
Aim The intent of this study was to evaluate the impact of pharmacists on patient self-care decisions and the utilization of other healthcare resources, including physicians and emergency services.
Method In a 4-week pilot study, each caller presenting to a drug information pharmacist within a teletriage program was asked two separate questions: *"What would you have done if you were not able to speak to a Telehealth pharmacist?"* at the start of the call and *"What are you going to do now with the information that I provided?"* after the pharmacist counseled the caller. The response to each question was categorized by the pharmacist to one of the following options: 1) go to emergency, 2) see physician, 3) ask local pharmacist, 4) call an information service line, 5) self-care, 6) no action or 7) not applicable. The data was evaluated for differences in the responses to the two questions.
Results A total of 1710 calls were captured. Ninety-four percent of patients who initially intended to go to the emergency room were redirected to other, more appropriate resources, such as physicians, community pharmacists, or to handle the situation on their own (self-care). Seventy-seven percent of patients, who would have seen their physician, were also directed to utilize more appropriate resources. Overall, 79% of patients indicated that they were now capable of self-care after speaking with the pharmacist, versus 23% before consultation.
Implications for Pharmacists Teletriage pharmacists positively impact health resource utilization by redirecting patients to more appropriate resources, and providing information to support self-care. These benefits are incremental to benefits conferred by the registered nurse. All teletriage programs should consider the integration of pharmacists to further support the appropriate utilization of health resources.

PRIMARY CARE INTERVENTION AND EDUCATION IN DIABETES: A PHARMACIST COORDINATED COMPARISON OF USUAL CARE VERSUS COLLABORATIVE PRIMARY CARE IN AFFECTING DIABETES CONTROL AND QUALITY OF LIFE

J. Rosin, K. Townsend

Background Diabetes education has been found to improve patient self-care and clinical outcomes through enhanced knowledge, improved skills, and support of appropriate behavioural changes.
Aim To assess the impact of pharmacist-delivered intervention and education on glycemic control, secondary endpoints, and the quality of life in diabetic patients, within the framework of a collaborative primary care setting.
Method Patients were randomized into either the intervention arm or the usual care arm. The patients in the intervention arm received a pharmacotherapy assessment, in-depth diabetes education and follow-up sessions with a pharmacist. Drug-related problems were identified and communicated to the primary care physician when necessary. Referrals to other health-care professionals were made when required. Patients in the usual care arm did not receive the same in-depth medication review or education; however, drug-related problems were documented. Endpoints in both arms include changes in glycosylated hemoglobin, fasting plasma glucose, lipids, blood pressure, and kidney function. Patient and physician acceptance of pharmacist-generated recommendations was tracked. Patients were required to complete the Diabetes Empowerment Scale (DES) at baseline and at the completion of the 6-month study period.
Results Results are currently not available, although the study is nearing completion. The endpoints of the intervention and usual care arms will be compared. The intervention group is expected to show a significant difference in clinical outcomes compared to the usual care group. An improvement in patient perception of self-management is also expected. Results will be available in June 2006.
Implications for Pharmacists This pilot project will determine to what extent primary care pharmacists can impact the achievement of desired therapeutic outcomes and patient self-management of diabetes. Pharmacists are ideal candidates to fill the gap in diabetic education services currently available to patients, particularly in rural areas. A combination of accessibility, therapeutic knowledge, and educational skill supports the assertion that pharmacists are ideally placed to assume an important emerging role in chronic disease state management. Patient education provided within the context of a collaborative, primary care framework not only aids in the development of inter-disciplinary relationships, but also provides a foundation for enhanced patient care.

COMMUNITY PHARMACY PATIENT SAFETY AND QUALITY IMPROVEMENT PILOT PROJECT

L. DeVos, H. Lopatka, S. Ontkean

Background Medication use is high in primary care setting with 382 million prescriptions dispensed in Canadian pharmacies. With 7587 licensed pharmacies this translates into over 50,000 prescriptions per pharmacy. Research suggests error rates ranging from 0.3% to 10%. Significant opportunity exists to improve safety through quality improvement models.

Aim This pilot project was conducted to assess implementation issues, methods and tools for a community pharmacy safety and quality improvement program.
Method A convenience sample of 34 community pharmacies was recruited from 3 pharmacy corporations/banner groups. Error and near miss reporting and adherence checklists were limited to events related to new prescriptions for patients 65 years or older. The multifaceted intervention consisted of pharmacist continuing education, provision of practice tool / checklist, provision of quality improvement model, consultation from quality improvement expert, and provision of comparative feedback report. Data was collected from April - December 2005, received through pharmacy safety self assessment survey, self report practice tool / checklists, self reported quality improvement report, quality improvement expert visit report, focus group report and participant interviews. Aggregate and time series comparisons were made pre and post multifaceted intervention.
Results Eleven of 34 pharmacies (1/3) submitted all the data required. 15 / 34 submitted partial data. Average pharmacy safety self-assessment scores improved 17.6 % in pre and post comparisons. 4189 practice adherence checklists were collected. Average adherence to pharmacy practice guidelines improved by 8.3% over the course of the project. 581 errors and near misses were reported. The majority of events were classified as near misses or could not be classified (99%). Pharmacies reported making 28 distinct operational changes as a result of the quality improvement process. Participant feedback indicated a moderate-high degree of satisfaction with the pilot study tools and protocols.
Implications for Pharmacists The pilot study showed that an educational and quality improvement intervention can be implemented in community pharmacy, provides valuable information about medication errors and near misses, and that it can result in pharmacy operational improvements. Changes to the current safety culture must be addressed for maximum effect.

AN INTERDISCIPLINARY MEDICATION MANAGEMENT PROGRAM FOR SENIORS IN THE COMMUNITY

N. Waite, L. MacKeigan, D. Chan, K. Wichman, R. Applebaum, S. VanderBent

Background The call for medication management programs (MMPs) is growing, as evidence of inappropriate prescribing and medication use in seniors accumulates. Seniors in social and supportive housing programs are likely at high risk of medication problems (MPs) by virtue of their socioeconomic status and/or frailty. Yet there are few published reports of MMPs in such settings.
Aim To assess the need for medication management support for seniors in a supportive housing setting; to profile a pharmacist's medication management interventions; and to evaluate the costs, barriers, facilitators and impact of a MMP.
Method Eleven seniors' apartment buildings in Peel region, served by one supportive housing provider, were randomized to experimental or control groups. Seniors in experimental buildings were referred to the MMP by supportive housing supervisors, health care professionals, or themselves. A pharmacist conducted in-home medication reviews. Her drug therapy assessment and recommendations were faxed to the family physician, and shared with other health care providers and caregivers as appropriate. Medication counselling and management aids were provided as needed. On average clients received 1.7 followup visits/phone calls. Medication regimen complexity,

adherence, and costs will be compared between groups at 3 months. Additional measures in the experimental group include number of pharmacist-identified MPs and interventions, acceptance of prescribing recommendations, client and health care provider satisfaction, and service cost.

Results Almost 100 clients have received the service. Of the first 50 clients, 83% were female with mean age 77.7 and an average of 8 prescription drugs and 2 nonprescription medicines each. The pharmacist identified 2.5 MPs per client and made 1.7 prescriber interventions and
1.1 client interventions. The most common MP (31%) was needing an additional drug. 67% of prescribing recommendations were known to be adopted/accepted. The service required 3.9 hours of pharmacist time per client. Data analysis is in progress.

Implications for Pharmacists In-home medication management reviews improve seniors' drug therapy. Opportunities exist for pharmacists to provide this service in nontraditional settings such as supportive housing or home care programs, thus increasing access and integrating primary care and community care providers in a coordinated medication support system for seniors.

Pharmacy Practice Research Presentations
Preparing Pharmacists for the Future
The Centre for COMmunity Pharmacy Research and Interdisciplinary Strategies (COMPRIS)
Salon 2 - Shaw Conference Centre
Chair – Franco Pasutto, PhD.

Ross T. Tsuyuki, BSc(Pharm), Pharm D, MSc, FCSHP, FACC, Professor of Medicine (Cardiology) and Director, EPICORE Centre/COMPRIS; Professor and Merck Frosst Chair in Patient Health Management, Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta

Ross Tsuyuki is currently a Professor of Medicine (Cardiology) and the Director of the Epidemiology Coordinating and Research (EPICORE) Centre, a health research coordinating centre (www.epicore.ualberta.ca) and the Centre for Community Pharmacy Research and Interdisciplinary Strategies (COMPRIS). He is also a Professor and Merck Frosst Chair in Patient Health Management in the Faculty of Pharmacy and Pharmaceutical Sciences at the University of Alberta. Dr. Tsuyuki has received several awards for teaching, as well as appointment as a Fellow of the Canadian Society of Hospital Pharmacists and the American College of Cardiology. Last year he was recognized as the 2005 Canadian Pharmacist of the Year by the Canadian Pharmacists Association and also received a Special First Prize from the International Pharmaceutical Federation (FIP) Community Pharmacy Section (with Terri Schindel). His research interests include: improving the care of patients with heart failure, prevention of cardiovascular disease, pharmacy practice research, and provision of support for other researchers.

Abstract: The Centre for COMmunity Pharmacy Research and Interdisciplinary Strategies (COMPRIS) is an interdisciplinary health research centre at the University of Alberta. COMPRIS is a unique collaboration of academia, industry, professional organizations, and healthcare practitioners who are dedicated to the improvement of patient care and outcomes.

Our Vision: Our vision is to be the leading internationally-recognized coordinating centre for pharmacy practice research. For pharmacy practice, *we envision pharmacists engaged in patient-centered care, supported by high quality research evidence of its efficacy, empowered in their work environment, continuously developing their professional skills, and recognized for their important contributions to patient care*.

Our Faculty: COMPRIS' faculty is an interdisciplinary group with a wide range of expertise in health research and various clinical specialties, including cardiology, thrombosis, internal medicine, quality of life, pharmacoepidemiology, nursing, nutrition, women's health, psychiatry, diabetes, and continuing professional development.

Our Research: We conduct community-based interdisciplinary practice research, using clinical trial and other methodologies to evaluate the impact of pharmacist, physician,

nurse, and other healthcare professional collaboration in disease management programs. The COMPRIS model of care takes advantage of the pharmacist's unique position in the community, proactively identifying and engaging patients at risk, and providing patient-specific interventions (education, liaison with other healthcare professionals, support and follow-up).
Training: We serve as a training centre for future generations of health researchers, with residents, MSc, PhD, and post doctoral fellowship programs.
Resources: We also serve as a resource centre for practitioners, researchers and other stakeholders both locally and internationally. We provide research support in the areas of health Dissemination/Health Policy Change: Conducting community and hospital practice research is of little use to patients if the findings are not disseminated to practitioners and health policymakers. This is particular true for pharmacy practice research. Through our health policy consultant, David Bougher, BSP, MHSA, we aim to change how healthcare is delivered.
Support For Practice Change: Similarly, patients cannot benefit from pharmacist's care if pharmacists do not adopt the findings from practice research. Through our partnership with the Faculty of Pharmacy and Pharmaceutical Sciences at the University of Alberta, and its Outreach Education Program (Theresa J. Schindel, BSP, MCE, FCSHP), we provide educational support through PHARMALearn.com and other activities.
COMPRIS*actus* is a new initiative which is focusing on health policy and practice change as it relates to pharmacists. Our blueprint, "Leading Change in Pharmacy Practice. Fully engaging pharmacists in patient-centered care" (available on our website) outlines our plan for uniting and engaging and supporting pharmacists in practice change.

Scot H. Simpson, B.S.P., Pharm.D., M.Sc. Assistant Professor, Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta.

Dr. Simpson received his Bachelor of Science in Pharmacy from the University of Saskatchewan in 1990 and completed a hospital pharmacy residency at the Regina General Hospital in 1991. He then worked as a staff pharmacist at the Yorkton Regional Hospital in Yorkton, Saskatchewan for three years. He obtained a Doctor of Pharmacy degree from the University of Toronto in 1997 and completed a combined postdoctoral fellowship (2000) and a Master of Science degree (2001) in the Faculty of Medicine and Dentistry, at the University of Alberta. Currently, Dr. Simpson is an Assistant Professor in the Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta and a clinical pharmacist with the Family Medicine Clinic at the University of Alberta Hospital. Dr. Simpson is a New Investigator supported by the Canadian Institutes of Health Research (CIHR), a Fellow of the Institute of Health Economics, a collaborator with the Alliance for Canadian Health Outcomes Research in Diabetes (ACHORD) in Edmonton, Alberta, and a member of the expert committee for the Canadian Diabetes Association Clinical Practice Guidelines.
Dr. Simpson's teaching and clinical practice interests are in medication management of diabetes and its complications, medication adherence issues, and the challenges of integrating evidence into practice. He has actively participated in a number of pharmacy practice and health services research studies. He has a published interest in evaluating the impact of medication adherence on health outcomes, identifying and overcoming patient-perceived barriers to medication use, and optimizing medication management of diabetes and cardiovascular disease.

Abstract: The Vascular Intervention Program (VIP): A strategy for medication management of cardiovascular risk in people with type 2 diabetes. Clinical trials have shown us that patients with type 2 diabetes can reap substantial benefits from interventions targeted at risk factors beyond glycemic control. In addition, numerous studies have shown that optimal management of hypertension, hypercholesterolemia, and hyperglycemia in people with type 2 diabetes often requires complex medication regimens. Because of these complex regimens, the potential for drug interactions and low adherence rates is quite possible. Pharmacists can be an integral member of the primary care team because of their recognized drug therapy knowledge. Pharmacists can take responsibility for reviewing the patient's medication profile to help ensure optimal use of medications through drug therapy recommendations, monitoring for therapeutic outcomes, and providing patient education.

The Vascular Intervention Program is investigating the efficacy of a pharmacist-led intervention program designed to optimize medication management of cardiovascular risk in people with type 2 diabetes. Pharmacists are collaborating closely with physicians and other health care professionals, and making medication management recommendations based on national clinical practice guidelines. In addition, the patient's perceived barriers to medication use will be addressed. The study is set within three primary care clinics affiliated with the South Side Edmonton Primary Care Network. The primary outcome is the proportion of people achieving a clinically important reduction in systolic blood pressure. VIP received peer-reviewed funding from the Canadian Diabetes Association and the Institute of Health Economics. Dr. Simpson also received a New Investigator salary award from the Canadian Institutes of Health Research based, in part, on this study.

Tammy J Bungard, BSP, PharmD, Assistant Professor of Medicine, Director, AMS Program, Division of Cardiology, University of Alberta, Edmonton, AB

Dr. Bungard graduated from the University of Saskatchewan with her Bachelor of Science in Pharmacy with Great Distinction in 1995. She went on to complete a general practice hospital residency at the Red Deer Regional Hospital Centre in 1996. Upon completing the Doctor of Pharmacy Program at Wayne State University, Detroit, Michigan in 1998 she began a Research Fellowship within the Division of Cardiology, University of Alberta. Work during this Alberta Heritage Foundation for Medical Research funded Fellowship lead to the initiation of the Anticoagulation Management Service (AMS), spearheaded through the University of Alberta Hospital. Initially funded through the Health Innovation Fund, Alberta Health & Wellness, positive results demonstrated facilitated the ary triage and rapid response cardiac clinic – another program now funded by Capital Health. Dr. ongoing funding of the AMS as a program by Capital Health. In 2003 she was a Co-Principle Investigator for another innovative grant, Cardiac EASE (Ensuring Access and Speedy Evaluation), a multidisciplin Bungard continues to provide direct patient care and undertake research within the AMS and Cardiac EASE programs. She has been actively involved with the Alberta College of Pharmacists (ACP), and continues to advocate for the proactive role of the pharmacist. She was presented with the Award of Excellence this year by ACP for her efforts to date.

Abstract: **Anticoagulation Management Service.** Anticoagulant therapy has been well proven to reduce thromboembolic complications, such as stroke and pulmonary embolism, provided it is maintained within a narrow therapeutic range. Numerous studies have shown that the use and control of anticoagulation achieved in routine medical care is sub-optimal. To this end, we established an anticoagulation management program, comprised of 3 stages: 1) initiation of a central or 'core anticoagulation management service (AMS), 2) implementation of a one month training program, and 3) initiation of 'satellite' AMS by those completing the training program. A thorough evaluation of the 'core' program revealed significantly superior control of anticoagulant therapy following referral to the AMS, as well as a reduction in thromboembolic and hemorrhagic events. Satisfaction assessments of patients and referring physicians were extremely positive. For the 'satellite' AMSs, a randomized trial of AMS care and routine medical care showed similar anticoagulant control in both groups, with significantly more patients in AMS care being satisfied. The evaluation, overall, has demonstrated favorable results. The methodology employed within this program may be applicable to alternate therapies / disease states.

Theresa J. Schindel, Director of Outreach Education, Faculty of Pharmacy and Pharmaceutical Sciences, University of Alberta

Terri is the Director of Outreach Education and an associate with COMPRIS at the University of Alberta. She has a Bachelor of Science in Pharmacy from the University of Saskatchewan, a fellowship with the Canadian Society of Hospital Pharmacists, and a Master of Continuing Education degree from the University of Calgary. Terri works on design and delivery of education to support clinical research and practice change and has extensive experience with development of distance education. She is active in the profession, serving on various committees for the University of Alberta, Alberta College of Pharmacists, Canadian Society of Hospital Pharmacists and is a member of the Editorial Board of the Canadian Pharmacists Journal. Areas of interest include: continuing professional development, learning in the workplace, and program evaluation. A paper she co-authored with Ross T. Tsuyuki entitled, "Leading change in pharmacy practice: fully engaging pharmacists in patient-oriented care", received recognition at the FIP Congress in Cairo, September 2005.

Abstract: Educational Support for Practice Change: Challenges and Issues. This environment of change brings both opportunities and challenges to pharmacists as they plan for expanded roles in health care delivery. The opportunities include implementing new and creative processes, challenging the status quo, and accepting roles in patient care. Many pharmacists hold full-time jobs and face unique challenges as they integrate learning with their working and home/family roles. Learning providers, including institutions, associations, continuing education and professional development units need to be aware of these challenges as they develop new pedagogical models. This presentation provides an overview of emerging issues related to the experiences, perspectives, and learning to promote continuous professional development through COMPRIS and the Faculty of Pharmacy and Pharmaceutical Sciences at the University of Alberta.

Carlo A. Marra, B.Sc.(Pharm.), Pharm.D., Ph.D., FCSHP Assistant Professor, Research Scientist, VCHRI; Director of CORE, Faculty of Pharmaceutical Sciences, University of British Columbia.

Carlo earned his B.S. (Pharm) degree in 1992, completed a hospital pharmacy residency at Vancouver General Hospital in 1993, and obtained a Pharm D degree in 1995, all from the University of British Columbia. From 1995 to 1999, he worked as a research pharmacist before enrolling in the PhD program in Health Care and Epidemiology at the University of British Columbia. Carlo holds Scholar Awards from the Canadian Arthritis Network and the Michael Smith Foundation for Health Research. Carlo's main research interests have been in health economics, quality of life research, and pharmacoepidemiology. Carlo has published more than 100 articles, book chapters, and research abstracts. Carlo has received more than 2 dozen other awards for scholarship, research, and service.

Abstract: C. A. Marra, J. Cibere, J. Soon, J. Esdaile, R. Tsuyuki, G. Ejeanor, L. Colley, A. H. Anis, L. Gastonguay, P. Embley, Centre for Clinical Epidemiology and Evaluation, Vancouver Coastal Health Research Institute, Vancouver, Arthritis Research Centre, UBC, Vancouver, Faculty of Pharmaceutical Sciences, Arthritis Research Centre, UBC, Vancouver, Medicine, University of Alberta, Edmonton, Centre for Clinical Epidemiology and Evaluation, Health Care and Epidemiology, UBC, Mary Pack Arthritis Centre, Vancouver General Hospital, Vancouver, Canada.

Background: Osteoarthritis (OA) is the most common arthritis and a leading cause of disability. Many with knee OA are not diagnosed and not referred for treatment. Despite a 25% prevalence of those >55 years reporting knee pain > 4 weeks in the last year, only 15% of these consult their physician. Therefore, the identification of patients with knee pain who have undiagnosed OA needs to be improved. **Objectives**: To determine if pharmacists, using a simple screening questionnaire, can identify individuals with previously undiagnosed knee OA. **Methods**: Subjects with knee pain and no previous diagnosis of knee OA were recruited by community pharmacists who used a simple questionnaire (<10 minutes to complete) to determine likelihood of knee OA. Subjects who were likely to have knee OA were referred to the provincial arthritis centre for a knee exam and a X-ray. The standardized knee exam (1) was used and ACR clinical criteria for diagnosing knee OA were applied. The Kellgren-Lawrence (K-L) grade was assigned by a rheumatologist who reviewed the x-rays. **Results**: Of the 411 subjects screened by the community pharmacists, 274 were deemed to be eligible. Of these, 44 declined to participate further, 34 were ineligible (18 had a previous OA diagnosis and 16 had other inflammatory conditions), and one died. The remaining 195 were mostly female (63%), mean age of 62 years, and were mostly white (86%). The body mass index (BMI) was classified as normal (18.5 - 24.9) in 28%; overweight (25.0-29.9) in 45%; and obese (>30.0) in 26%. Of those examined, 161 (83%) met ACR clinical criteria for knee OA, 25 (13%) were likely have OA but did not meet the criteria, and 9 (4%) were unlikely to have knee OA. The radiographic results revealed that half of the participants had K-L grade of 0, 15% of 1, 23% of 2; 10% of 3, and 2% of 4.

Conclusion: Pharmacists administering a simple screening questionnaire can identify >70% of those with knee pain who have undiagnosed knee OA. Based on radiographs,

much of this OA is early and may be amenable to intervention.

David J. Bougher, Health Policy Consultant, Centre for Community Pharmacy Research and Interdisciplinary Strategies, University of Alberta

David Bougher is a pharmacist with community and hospital experience in Alberta, Ontario and Saskatchewan. He worked for a significant portion of his career with the Alberta government in a variety of roles, including serving as Director responsible for providing support for newly formed regional health boards in Alberta, and most recently as Director of the Pharmaceutical Policy and Programs Branch for Alberta Health and Wellness. While working with the Alberta government, he was responsible for implementing a number of new programs, including the Palliative Care Drug Program and the Multiple Sclerosis Drug Program, and leading major initiatives at the Federal/Provincial/Territorial level, including the Common Drug Review and the Canadian Optimal Medication Prescribing and Utilization Service.

Since leaving the Alberta government in 2004, David has been providing consulting advice to private and public organizations, including the University of Alberta. He has a Bachelor of Science Degree in Pharmacy from the University of Saskatchewan, and a Master of Health Services Administration Degree from the University of Alberta.

Abstract: Health Policy and Practice Change, Ross Tsuyuki and David Bougher A positive and supportive health policy environment is essential to realize the findings of pharmacy practice research, change pharmacists' practices, and ultimately improve patient care and health outcomes. Policy enablers must be aligned with the mandates, goals, and objectives of key stakeholders, including academia, government, professional and regulatory organizations, and practicing health professionals. The private sector and patients are also key components in the network of stakeholders. Leadership provided through COMPRIS has been instrumental in moving the practice change agenda forward in Alberta. As developmental work continues, it will be important to ensure a collaborative and inclusive approach to working with stakeholders to achieve practice change that enhances health system efficiencies and improves patient health outcomes. This presentation provides an overview of key strategic considerations and COMPRIS' approach to achieving change within the Alberta policy environment.

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CATEGORY	**TITLE**	**AUTHORS**	**PAGE**
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BR3 - AFPC	Epinephrine for the treatment of anaphylaxis: Do all sublingual epinephrine tablet formulations have the same bioavailability?	*Rawas-Qalaji MM*, Simons FE, Simons KJ	65
BR4 - AFPC	Micelles of poly(ethylene oxide)-*block*-poly(caprolactone)(PEO-*b*-PCL) as a vehicle for solubilization and tumor-targeted delivery of cucurbitacin I	*Molavi O,* Ma Z, Hamdy S, Lavasanifar A, Kwon GS, Samuel J	66
BR5 - AFPC	Delivery of toll-like receptor ligand encapsulated in polyD,L-lactic-co-glycolic acid) to mouse dendritic cells to overcome T regulatory cell-mediated immunosupression	*Molavi O*, Hamdy S, Elamanchili P, Samuel J	66
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RESEARCH POSTER ABSTRACTS

BASIC RESEARCH POSTERS

MECHANISTIC RELEASE STUDIES OF PILOCARPINE NITRATE FROM ELASTOMERIC IMPLANTS

H. Ellaboudy, J. Reid, H.M. Younes

Purpose To study the effect of the drug particle size, device shape, drug loading and osmolalities of various dissolution media on the release rate of the osmotically active drug, Pilocarpine Nitrate (PN) from silicone elastomeric implants.
Methods PN powder was mixed with the silicone elastomer base and the curing agent. The homogenous mix was then filled into Teflon molds and left to cure in the fume hood for 24 hours. Tabular and cylindrical devices loaded with 18% v/v PN powder of different particles sizes (45, 100, and 300 μm) were prepared. The drug-loaded silicone implants were subjected to release studies using dissolution media of different osmolalities (phosphate buffered saline, 3% w/v sodium chloride, and deionized water). At various time intervals, samples from the dissolution media were withdrawn and analyzed using ultraviolet analysis. The drug fraction released of PN was plotted against time for further data analysis.
Results Contrary to previous reports, devices formulated with the same volumetric loading and smaller drug particles sizes released drug faster than those devices with a larger particle size. The tabular implants were of faster release rate when compared to cylindrical devices. In addition, the release profiles demonstrated that osmotic release was the predominant mechanism governing the release of PN from silicone elastomers.
Conclusions Drug particles with smaller particle sizes are released more rapidly from silicone matrix devices as compared to drug particles of larger sizes. The release mechanism was a mix of diffusion and a more predominant osmotic release which was mainly dependent on the volumetric loading of the drug, the percolation threshold, the implant's design and the mechanical properties of the elastomer.

RELEASE OF OSMOTICALLY ACTIVE DRUGS FROM ELASTOMERIC MATRICES: MATHEMATICAL MODELING

J. Reid, H. Ellaboudy, H.M. Younes

Purpose To develop and examine a new mathematical model which can predict the release of osmotically active drug particles from non-degradable, hydrophobic elastomeric matrices.
Model Assumptions and Methods Drug particles are evenly distributed in matrix-enclosed capsules within the elastomeric device. The capsules are assumed to be distributed in the matrix in concentric layers. Once immersed in aqueous environment, water vapor diffuses through the elastomeric matrix until it reaches a capsule. The water dissolves the drug particles within the capsule creating an osmotic pressure gradient which drags more water to enter the capsule causing it to swell. When the hydrostatic pressure exerted inside the capsule exceeds the maximum resisting pressure of the

elastomer, the capsule ruptures and the dissolved drug is released into the environment. This process occurs layer by layer until all the drug particles are released. Data generated from the release studies of Pilocarpine Nitrate loaded into silicone elastomeric implants were used to test the predictability of this newly developed model.
Results The equation developed showed that osmotic drug release from elastomeric matrices is dependent on the device geometry, the drug particle size, the volumetric loading of the drug, the size of the created capsule, the permeability and the mechanical properties of the elastomer. The model developed was found to establish similarity between theoretically and experimentally generated data.
Conclusions A new mathematical model was developed which can be used to predict the release of water soluble drugs from implantable, non-degradable, elastomeric matrices. The model outlined the main parameters affecting the drug release which can be used to aide in the development of implantable elastomeric devices with a pre-determined release pattern.

EPINEPHRINE FOR THE TREATMENT OF ANAPHYLAXIS: DO ALL SUBLINGUAL EPINEPHRINE TABLET FORMULATIONS HAVE THE SAME BIOAVAILABILITY?

M.M. Rawas-Qalaji, F.E. Simons, K.J. Simons

Rationale To evaluate the bioavailability of epinephrine from 4 different fast-disintegrating sublingual tablet formulations (FDSTF) compared with epinephrine 0.3 mg intramuscular injection.
Methods Four FDSTF containing 40 mg of epinephrine (A, B, C, and D) were prepared by direct compression. All formulations were evaluated for tablet weight variation (WV), content uniformity (CU), hardness (H), disintegration time (DT), and wetting time (WT). In a validated rabbit model (n=5), tablets were administered sublingually and retained under the rabbit tongue for 5 min, and epinephrine 0.3 mg, by EpiPen®, was injected in the thigh muscle. Twelve blood samples were collected at predetermined times, before and up to 180 min after dosing. Epinephrine plasma concentrations (EPC) were measured using HPLC-EC. Data were analysed using repeated measures ANOVA and Tukey-Kramer tests at a level of significance $p < 0.05$.
Results All formulations met WV and CU USP standards, and H, DT, and WT were within an acceptable range (n=6) (mean±SE, 1.5±0.1 to 2.6±0.1 Kgf, 8.3±0.3 to 13.5±0.2 sec, and 14.3±0.6 to 47.3±3.3 sec, respectively). The AUC of A (AUC=615 ng/ml/min), B (AUC=646 ng/ml/min), and C (AUC=606 ng/ml/min) were not significantly different ($p<0.05$) from each other, but significantly lower ($p>0.05$) from epinephrine 0.3 mg intramuscularly (AUC=2,431 ng/ml/min). The AUC, Cmax, and Tmax of D (AUC=1,861 ng/ml/min, Cmax=27.5 ng/ml, Tmax=15 min) and epinephrine 0.3 mg intramuscularly (AUC=2,431 ng/ml/min, Cmax=29.0 ng/ml, Tmax=10 min) were not significantly different from each other.
Conclusions In this rabbit model, formulation D was bioequivalent to epinephrine 0.3 mg intramuscular injection. Formulations A, B, and C had similar *in vitro* characteristics to D but were not bioequivalent to epinephrine 0.3 mg intramuscular injection.

MICELLES OF POLY(ETHYLENE OXIDE)-*BLOCK*-POLY(CAPROLACTONE)(PEO-*B*-PCL) AS A VEHICLE FOR SOLUBILIZATION AND TUMOR-TARGETED DELIVERY OF CUCURBITACIN I

O. Molavi, Z. Ma, S. Hamdy, A. Lavasanifar, G.S. Kwon, J. Samuel

Cucurbitacin I is an anti-cancer inhibitor of the janus kinase 2/signal transducer and activator of transcription 3 (JAK2/STAT3) pathway. STAT3 is hyperactive in many types of cancer and plays a major role in tumor cell growth, resistance to apoptosis and cancer immune evasion. Cucurbitacin I has been shown to inhibit STAT3 in several cancer cell lines *in vitro*, facilitate tumor rejection in a murine carcinoma model *in vivo* and modulate tumor-induced immunosuppression. Cucurbitacin I has been considered as one of the most worth pursuing compounds for STAT3 targeting in cancer therapy but its clinical application is restricted by its poor solubility and non-specific toxicicity

Objective The aim of this study was to assess the potential of poly(ethylene oxide)-*block*-poly(caprolactone) (PEO-*b*-PCL) micelles as vehicles for solubilization and tumor-targeted delivery of cucurbitacin I.

Methods PEO-*b*-PCL micelles of cucurbitacin I were prepared by co-solvent evaporation method and characterized for particle size distribution and encapsulation efficiency by Zeta sizer and liquid chromatography/mass spectrometry method, respectively. The effect of free and encapsulated cucurbitacin I on STAT3 inhibition in B16 cell lines was investigated by Western blotting.

Results PEO-*b*-PCL micelles encapsulated cucurbitacin I with 61 ± 6.5% encapsulation efficiency. The average diameter of micelles was 46±11 nm with polydispersity of 0.1± 0.02 after drug loading. Western blotting of B16 cell lysate after treatment with free and encapsulated drug indicated the inhibition of STAT3 phosphorylation by cucurbitacin I micelles as efficiently as what was observed with free drug.

Conclusion Our results indicate that PEO-*b*-PCL micelles may provide a suitable vehicle for solubilization and tumor-targeted delivery of cucurbitacin I.

DELIVERY OF TOLL-LIKE RECEPTOR LIGAND ENCAPSULATED IN POLY(D,L-LACTIC-CO-GLYCOLIC ACID) TO MOUSE DENDRITIC CELLS TO OVERCOME T REGULATORY CELL-MEDIATED IMMUNOSUPRESSION

O. Molavi, S. Hamdy, P. Elamanchili, J. Samuel

$CD4^+$ $CD25^+$ T regulatory cells (Treg) play a major role in tumor-induced immunosuppression which has been considered as a major challenge in the development of an effective vaccine against cancer. Previous studies from our lab have shown that treatment of immature dendritic cells (DCs) with toll-like receptor 4 (TLR4) ligand, monophosphory lipid A (MPLA), encapsulated in poly(D,L-lactic-co-glycolic acid) (PLGA) nanoparticle results in functional maturation of DCs evidenced by pro-inflammatory cytokine secretion by DCs and increased T cell allo-stimulation.

Objective In this study we proposed to investigate PLGA nanoparticle delivery of MPLA, to normal mouse DCs for overcoming immunosuppressive effects of Treg on $CD4^+$ $CD25^-$ T cells proliferation *in vitro.*

Methods $CD4^+$ $CD25^-$ T cells and Treg were purified from total splenocytes of C57BL/6 normal mice using EasySep™ selection cocktails. Mouse bone marrow originated DCs

were treated with 0.1-2 □g/ml MPLA, (soluble or encapsulated in PLGA nanoparticales), or bacterial lipopolysaccharide (LPS) and incubated for 24 hours at 37 ^{0}C, then untreated and treated DCs were irradiated, washed, resuspended in their own culture media (collected from the culture of DCs on day 7 after treatment with the formulations) and co-cultured with $CD4^{+}$ $CD25^{-}$ T cells in the presence and absence Treg for 60 hours. Proliferation of T cells was determined by incorporation of ^{3}H-thymidine for the last 24 hours of the culture.
Results Our results indicate that the activation of DCs through their TLR4 by MPLA, formulated in PLGA nanoparticles slightly reduces the suppressive effects of Treg on T cell activation but it can't completely reverse their suppressive effects on T cell activation *in vitro*. Alternative approaches are under investigation to overcome Treg-mediated immunosuppression.

NANOTECHNOLOGY APPROACH TOWARDS BRAIN DELIVERY OF GLIAL CELL LINEDERIVED NEUROTROPHIC FACTOR (GDNF) IN PARKINSON'S DISEASE

V. Rivest, V. Émond, F. Calon

Background The gene encoding glial cell line-derived neurotrophic factor (GDNF) is one of the most promising candidates for neuroregenerative gene therapy in Parkinson's disease. However, since vectors available for gene therapy do not cross the blood-brain barrier, the development of an innovative brain transport system for this gene medicine is essential.
Objectives The objectives of this work were to generate plasmids expressing GDNF and to develop a GDNF brain transport system.
Methods Plasmids encapsulation experiments into liposomes conjugated to monoclonal antibodies (MAbs) have first been realized. The size of the liposomes was measured by quasi-elastic light scattering (QELS) analyses. In parallel experiments, plasmid constructions producing the GDNF protein were generated and transfected in the COS-7 cell line, and their expression capacity was evaluated by Western Blot and by Enzyme-linked Immunosorbant Assays (ELISA).
Results A mean plasmids encapsulation efficiency of 70.80 ± 2.53 % (n = 29) and a mean MAbs conjugation efficiency of 69.30 ± 4.50 % (n = 23) have been obtained. The mean diameter of the liposomes was 66.0 ± 2.7 nm (without MAbs) and 79.8 ± 3.8 nm (with MAbs), and the size of the liposomes remained stable up to three weeks after synthesis. A strong expression of the GDNF protein was detected by ELISA in culture supernatants (16145 ng/g of total proteins) and by Western Blot in the cellular components.
Conclusion The present results laid the groundwork in the development of a nanotechnology formulation for non-invasive gene therapy in Parkinson's disease, and upcoming *in vitro* and *in vivo* experiments will be discussed.

LEUKOTRIENE B4 AND PLATELET ACTIVATING FACTOR COOPERATE TO REGULATE NEUTROPHIL TRAFFICKING TO CUTANEOUS SITES

L. Hamdan, P. Borgeat, S. Marleau

Objectives In the present study, we investigated the potentially cooperative role of the lipid mediators leukotriene B4 (LTB4) and platelet-activating factor (PAF) in regulating polymorphonuclear neutrophils (PMNs) trafficking at dermal inflammatory sites.
Methods Rabbits were pretreated orally with a selective antagonist of the LTB4 (BIIL 284) and/or the PAF (WEB 2086) receptors, 2 hours before the induction of dermal inflammation. Locally injected agonists included LTB4 (500 pmol), PAF (2 nmol), TNFα (10 pmol), IL-8 (10 pmol) and 1% zymosan activated plasma (ZAP). Myeloperoxidase contained in PMN granules was assayed as a marker of PMN accumulation in skin biopsies, whereas the cutaneous oedema was assessed by measuring labeled-albumin leakage in skin 30 minutes after its i.v. injection.
Results When LTB4 was injected intradermally, PMN accumulation in the skin was inhibited by 62 ± 4% and 34 ± 4% ($P < 0.001$) in animals treated with BIIL 284 and WEB 2086, respectively. Concomitant administration of the drugs had an additive inhibitory effect (80 ± 3%, $P < 0.001$). Similarly, the two antagonists had a higher inhibitory effect than after single drug adiministration for all agonists under investigation. PAF-elicited PMN migration was inhibited by 90 ± 4% ($P < 0.001$) compared with 39 ± 4% and 77 ± 4% ($P < 0.001$) after a single dose of BIIL 284 or WEB 2086, respectively. Inhibitory effect on PMN accumulation elicited by the injection of chemically unrelated agonists, such as TNFα, was also higher than the effect of a single drug, 65 ± 5% ($P < 0.001$).
Conclusion Our results support that LTB4 and PAF are key regulators of PMNs migration elicited by inflammatory agonists. Supported by CIHR.

PURIFICATION OF RECOMBINANT GLUCOSE-1-PHOSPHATE THYMIDYLYL-TRANSFERASES FROM *STREPTOCOCCUS PNEUMONIAE* AND *STREPTOCOCCUS MUTANS*

S.A. Knowles, D.L. Jakeman, R.H. Mosher

Objective To clone, overexpress, and purify glucose-1-phosphate thymidylyl-transferases from *Streptococcus pneumoniae* and *Streptococcus mutans,* targets for novel antimicrobial drugs.
Methods Polymerase Chain Reaction (PCR) was used to amplify *cps2L* and *rmlA* genes encoding glucose-1-phosphate thymidylyltransferases from *S. pneumoniae* and *S. mutans*, respectively. Amplified genes were cloned into the *E. coli* vector, pET-28(a), and transformed into BL21 AI *E. coli*. Overexpression was achieved by inducing with isopropyl-β-D-thiogalactopyranoside (IPTG) and L-arabinose. The resulting His6-tagged proteins were purified by Nickel-Affinity Chromatography as observed by SDS-PAGE analysis.
Results Restriction enzyme analysis confirmed the identity of the cloned PCR products based on the known structure of the DNA sequences of the genes from both *S. pneumoniae* and *S. mutans*. Induction of *E. coli* strains containing recombinant plasmids pSK001 (pET-28(a) + *S. pneumoniae cps2L*) and pSK002 (pET-28(a) + *S. mutans rmlA*) resulted in overexpression of proteins with relative molecular weights consistent with

those predicted for Cps2L and RmlA, respectively, as observed by SDS-PAGE analysis. Cps2L and RmlA were purified and fractions containing only the purified enzyme were concentrated for enzymatic analysis.
Conclusions Key enzymes, Cps2L and RmlA, involved in cell wall biosynthesis of *S. pneumoniae* and *S. mutans*, have been purified. These purified enzymes will be evaluated using novel synthesized compounds designed to inhibit their enzymatic activity. Identified potent inhibitors will result in a weakened cell wall and bacterial death.
Acknowledgements The Canadian Foundation for Innovation, the Nova Scotia Research and Innovation Trust, the Pharmacy Endowment Fund for funding, and Erin Genter and the Jakeman Research Group for technical assistance.

ACTIVATION OF AMPK BY METFORMIN PREVENTS HIGH FAT INDUCED CARDIOMYOCYTE CELL DEATH

J.K. Chan, J. Ding An, B. Rodrigues

In obese and Type 2 diabetic patients, high levels of circulating fatty acids (FAs) leads to excessive triglyceride (TG) accumulation in the heart. This is known to stimulate oxidative stress through caspase-3 (a pro-apoptotic protein), which subsequently promotes regulated cell death (apoptosis). Metformin has previously been shown to promote FA oxidation and reduce TG accumulation through AMP-activated protein kinase (AMPK).
Purpose Given the increasing and chronic use of metformin in Type 2 diabetes, the objective of the present study was to investigate whether activation of AMPK with metformin can prevent high fat-induced apoptosis in cardiomyocytes.
Methods Hearts were extracted from male Wistar rats, and digested with collagenase enzymes to isolate individual cardiomyocytes. Cardiomyocytes were incubated overnight under conditions of both high fat (1 mM palmitic acid (PA)) and metformin (1 and 2 mM). Total cell protein was isolated from myocytes, and Western blotting was used to measure AMPK and acetyl CoA carboxylase [ACC] (to determine extent of FA oxidation). Oxidative stress was evaluated by measuring caspase-3 activity. The degree of cell damage was monitored by evaluating the levels of lactate dehydrogenase (LDH) released into the culture medium.
Results Metformin was found to increase FA oxidation (decrease FA accumulation) by phosphorylating AMPK, and inhibiting caspase-3 activity. In doing so, metformin prevented high FA-induced apoptosis (programmed cell death) as indicated by reduced LDH release.
Conclusions Our results suggest that metformin serves to significantly protect cardiomyocytes against high fat induced toxicity, through AMPK-mediated mechanisms. This beneficial effect of metformin is clinically relevant, as many Type 2 diabetic patients are prone to high fat induced cardiovascular disease.

CD36 LIGANDS STIMULATE ABCG1-DEPENDENT EFFLUX OF LIPIDS FROM PERITONEAL MACROPHAGES

K. Bujold, M. Febbraio, S. Marleau, H. Ong

Cholesterol homeostasis within macrophages results from the net flux between oxidized low density lipoprotein (oxLDL) uptake and cholesterol efflux through transporters of the ABC family. Disruption of cholesterol homeostasis secondary to excessive oxLDL uptake and cholesteryl ester storage leads to macrophage foam cells formation and fatty streak lesions. We recently showed that EP 80317, a selective CD36 ligand, exerts anti-atherosclerotic effects in ApoEdeficient mice fed a high fat high cholesterol diet.
Objective To determine whether EP 80317 promotes cholesterol and phospholipid efflux from mice peritoneal macrophages and murine J774 cell line, *in vitro* experiments were conducted.
Methods Cells were loaded with [^{3}H]-cholesterol (1 µCi/ml) or [^{3}H]-choline (1 µCi/ml), incubated ± EP 80317 (100 nM) and exposed to HDL (50 µg/ml) in order to promote efflux. PPARγ-LXRα-ABC proteins were determined by Western blots.
Results EP 80317 induced a significant increase in cholesterol and phospholipid efflux from peritoneal macrophages by 20% and 23% ($P<0,01$), respectively. Similar results were observed in J774 cells. The stimulatory effect of EP 80317 on lipid efflux from J774 cells was completely inhibited in cells treated with DIDS, an ATP-binding cassette inhibitor. In contrast, there was no significant effect of EP 80317 on cholesterol efflux in macrophages isolated from mice lacking CD36. The expression of the proteins involved in the reverse transport of cholesterol to the liver was increased by 2.5- and 2.2-fold for LXRα and ABCG1, respectively. No change was observed for PPARγ and ABCA1 protein levels.
Conclusions EP 80317 elicits cholesterol and phospholipid efflux from peritoneal macrophages and J774 cells in a CD36-dependent manner. ABCG1 seems to play a major role in EP 80317mediated efflux.

VECTORIAL TRANSPORT OF ENALAPRIL BY OATP1A1/MRP2 AND OATP1B1 AND OATP1B3/MRP2 IN RAT AND HUMAN LIVERS

L. Liu, Y. Cui, A.Y. Chung, Y. Shitara, Y. Sugiyama, D. Keppler, K.S. Pang

Objective Enalapril (EN) but not its metabolite enalaprilat (ENA) readily enters the rat liver via the Oatp1a1 (organic anion transporting polypeptide 1a1). The involvement of Mrp2, the multidrug resistance-associated protein 2, in the excretion of EN and ENA was appraised in the Eisai hyperbilirubinemic rat (EHBR) that lacks Mrp2. The involvements of human OATP1B1, OATP1B3 and MRP2 in EN hepatic transport were assessed in single- or double-transfected mammalian cells.
Methods Male EHBR rats (240-265 g) were used for single pass liver perfusion with the [^{3}H]EN. Human embryonic kidney (HEK) 293 cells transfected with OATP1B1 or OATP1B3 were used for the uptake studies with EN concentrations range from 20 to 500 □M. The transcellular transport of EN *via* human OATP1B1 and MRP2 was investigated with double-transfected Madin-Darby canine kidney (MDCK) II cells expressing both OATP1B1 and MRP2 in Transwell®.

Results The bile flow rate and steady state biliary clearance of EN and ENA were reduced statistically ($P < 0.05$) in EHBR (n = 5) vs. Sprague Dawley rats (n = 4). HEK 293 cells transfected with OATP1B1 or OATP1B3 revealed that EN transport of OATP1B3 was of low affinity, whereas transport of OATP1B1 was associated with the *K*m of 262 □M. The vectorial transport of EN by the OATP1B1/MRP2/MDCK was significant higher ($P < 0.05$) than those by mock/MDCK and OATP1B1/MDCK.
Conclusion In the liver, EN was transported by Oatp1a1 and Mrp2 in rats and OATP1B1/OATP1B3 and MRP2 in humans.

DESIGN, SYNTHESIS AND BIOLOGICAL EVALUATION OF A NOVEL CLASS OF ROFECOXIB DERIVATIVES AS DUAL INHIBITORS OF CYCLOXYGENASES (COXS) AND LIPOXYGENASES (LOXS)

Q.H. Chen, P.N. Rao, E.E. Knaus

Study objectives A group of rofecoxib derivatives possessing an oxime, or an *N*-hydroxyl carbamate, substituent at the *para*-position of C-3 phenyl were designed for evaluation as dual inhibitors of cyclooxygenases (COXs) and lipoxygenases (LOXs).
Methods Binding site information obtained from the X-ray crystal structures of both cyclooxygenases (COX) and lipoxygenases (LOX) were used to design the target compounds. Multi-step synthetic methods were developed to synthesize the target 3-(4-substituted phenyl)-4-(4-methanesulfonylphenyl)-2(5*H*)furanones. Their abilities to inhibit both cyclooxygenase isozymes (COX-1/COX-2) and both lipoxygenase isozymes (5-LOX/15-LOX) were determined in vitro using a commercially available enzyme immunoassay (EIA) kits.
Results *In vitro* COX-1 and COX-2 isozyme inhibition structure-activity studies showed that the oxime anologues of rofecoxib are potent and selective COX-2 inhibitors; while the COX-2 inhibitory activities of *N*-hydroxyl carbamate derivatives of rofecoxib are very weak. Among the group of compounds evaluated during the *in vitro* COX-1/COX-2 isozyme and 5-LOX/15-LOX isozyme inhibition assays, 4-[4-(4-methanesulfonylphenyl)-2(5*H*)furanon -3-yl]acetophenone oxime exhibited an optimal combination of COX and LOX inhibition (COX-1 IC50 > 100 μM; COX-2 IC50 = 1.41 μM; COX-2 SI > 71; 5-LOX IC50 = 0.28 μM; 15-LOX IC50 = 0.32 μM).
Conclusions The results of this investigation showed that incorporation of a *para* oxime moiety on the C-3 phenyl ring of the rofecoxib provides a suitable template for the design of dual inhibitors of COX and LOX.

DESPITE ITS PHARMACODYNAMIC INFLUENCE, VALSARTAN- VERAPAMIL INTERACTION IN INFLAMED RAT IS AT THE PHARMACODYNAMIC LEVEL

S.H. Mahmoud, N. Dagenais, F. Jamali

Purpose Inflammation has been shown to elevate plasma verapamil concentration but diminish pharmacological response. Valsartan, an angiotensin II receptor blocker, is found to reverse that diminishing effect of inflammation on response to verapamil. The purpose of this study is to investigate whether this effect is due to altered verapamil pharmacokinetics or not.
Methods Four groups of male Spague-Dawley rats (230-280 grams, n= 3-4/group) were

divided as Pre-adjuvant-valsartan, Pre-adjuvant-placebo, Control-valsartan and Control-placebo. Pre-adjuvant arthritis (Pre-AA) was induced by injecting 0.2 ml of 50mg/ml *Mycobacterium butyricum* suspended in squalene into the tail base. Controls received an equal volume of normal saline (day 0). From day 6 to 12, 30 mg/kg p.o.valsartan or placebo was administered orally every 12 h to respective groups. At day 12, a single oral dose of 25 mg/Kg) verapamil was administered orally to all groups. Plasma samples were collected at 0, 20, 40, 60, 120 and 240 minutes post-dosing for verapamil analysis.
Results Plasma verapamil enantiomers concentration was significantly elevated in both Pre-AA groups as compared to Control (AUC0-4h 5 and 9 folds greater; Cmax, 7 and 19 folds higher in Pre-AA groups for R and S enantiomers, respectively). There was no significant difference between Pre-AA and Control groups treated with valsartan.
Conclusion Valsartan treatment does not have an effect on the pharmacokinetics of verapamil in Pre-adjuvant arthritis rats. Thus, the interaction between valsartan and verapamil is at the pharmacodynamic level.

INDUCTION OF THE CARCINOGEN METABOLIZING ENZYME CYTOCHROME P450 1A1 BY THE FOOD FLAVORING AGENT, MALTOL

A. Anwar-Mohamed, A.O. El-Kadi

Purpose Maltol is used extensively as a flavor-enhancing agent, food preservative, antioxidant, and in cosmetic and pharmaceutical formulations. However a number of studies have shown that maltol may induce carcinogenicity and toxicity but the mechanisms involved remain unknown. Therefore, we examined the ability of maltol to induce the cytochrome P450 1a1 (Cyp1a1), an enzyme known to play an important role in the chemical activation of xenobiotics to carcinogenic derivatives.
Methods Murine hepatoma Hepa 1c1c7 cells were treated with various concentrations of maltol (3-hydroxy-2-methyl-4-pyrone) in the absence or presence of different transcriptional and translational inhibitors. Maltol cytotoxicity was assessed by MTT assay and Cyp1a1 mRNA and protein levels were measured using Northern and Western blot analyses, respectively. The Cyp1a1 activity was determined using 7-ethoxyresurofin as a substrate.
Results Our results showed that maltol had no apparent cellular toxicity effects at all concentrations tested. In addition, a significant concentration-dependent increase in Cyp1a1 mRNA, protein, and activity occurred after treatment of Hepa 1c1c7 cells with maltol. The RNA synthesis inhibitor, actinomycin D, completely blocked the Cyp1a1 induction by maltol, indicating a requirement of de novo RNA synthesis through transcriptional activation. The protein synthesis inhibitor cycloheximide superinduced the maltol-mediated induction of Cyp1a1 mRNA and completely prevented the increase in Cyp1a1 activity, indicating that the induction of enzyme activity by Cyp1a1 is dependent on de novo protein synthesis. In addition, maltol induced aryl hydrocarbon receptor/xenobiotic-responsive element (AhR/XRE) binding, suggesting an AhR-dependent mechanism.
Conclusions This is the first demonstration that the food flavoring agent, maltol, can directly induce Cyp1a1 gene expression in an AhR-dependent manner and may represent a novel mechanism by which maltol promotes carcinogenicity and toxicity.

A NOVEL MECHANISM OF INDUCING THE CARCINOGEN-ACTIVATING XENOBIOTIC METABOLIZING ENZYME CYTOCHROME P450 1A1 (CYP1A1) BY THE ANTIFUNGAL DRUGS

M. Korashy, A. Shayeganpour, D.R. Brocks, A.O. El-Kadi

CYP1A1 is a carcinogen-activating xenobiotic metabolizing enzyme that is regulated by a ligand-dependent transcription factor, the aryl hydrocarbon receptor (AhR). Ketoconazole (KTZ) and itraconazole (ITZ) are widely prescribed antifungal drugs for the treatment of systemic fungal infections; however, increasing evidences of hepatotoxicity and liver adenomas have been reported. The mechanisms remain unknown.
Purpose To investigate the capacity of KTZ and ITZ to induce CYP1A1 and explore the molecular mechanisms involved.
Methods Murine and human hepatoma cells were treated with various concentrations of KTZ and ITZ. The CYP1A1 mRNA and protein levels were measured using Northern and Western blot analyses, respectively, whereas the catalytic activity was determined using 7ethoxyresorufin as a substrate.
Results KTZ and ITZ are capable to induce the CYP1A1 in murine and human cells at the mRNA, protein and activity levels in a concentration and time dependent manner. The increases in CYP1A1 mRNA were completely blocked by the transcriptional inhibitor, actinomycin D, whereas the level of exciting mRNA was not affected, implying that KTZ and ITZ increase the *de novo* RNA synthesis through a transcriptional mechanism. The ability of KTZ and ITZ to directly bind and activate AhR transformation *in vitro*, as determined by EMSA, was strongly correlated with their abilities to induce the luciferase reporter gene expression.
Conclusions This study provides the first evidence for the ability of KTZ and ITZ to induce the carcinogen-activating enzyme CYP1A1 gene expression through an AhR-dependent mechanism, and that suggests a novel mechanism of the KTZ-and ITZ-mediated hepatotoxicity.
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ASCORBIC ACID DIFFERENTIALLY MODULATES THE INDUCTION OF HO-1, NQO1, AND GST YA ENZYMES BY As^{3+}, CD^{2+} AND CR^{6+}

R.H. Elbekai, J. Duke, A.O. El-Kadi

Objective Heavy metal-induced oxidative stress modulates Cyp1a1 at transcriptional and posttranscriptional levels but induces Nqo1 and Gst ya at the transcriptional level. Interestingly, the induction of oxidative stress by heavy metals may have therapeutic benefit. The efficacy of As^{3+}, one of the most important environmental toxins, in the treatment of acute promyelocytic leukemia has been confirmed. With the proven role of Nqo1 and Gst Ya in the protection against certain types of cancers, and the ability of ascorbic acid (AA) to potentiate the anticancer effect of As^{3+}, it is expected that this antioxidant will have a paradoxical effect on the ability of heavy metals, specifically As^{3+}, to induce these enzymes.

Methods Hepa 1c1c7 cells were treated with 1 nM TCDD, the metals As^{3+}, Cd^{2+}, or Cr^{6+}, or both. When applicable, 1 mM ascorbic acid was added 1 h prior to addition of the metals. mRNA levels were analyzed using Northern Blot techniques. Instrumental neutron activation analysis was used to determine intracellular As^{3+} content.

Results All metals significantly induced HO-1, Nqo1 and Gst ya mRNA levels and potentiated their induction by TCDD. AA superinduced the induction of Nqo1 and Gst ya mRNA by As^{3+} in the absence and presence of TCDD, while inhibiting the induction by Cd^{2+} and Cr^{6+}. Interestingly, AA did not alter the cellular uptake or efflux of As^{3+}.

Conclusion The evidence presented here indicates that AA may potentiate the therapeutic efficacy of As^{3+} by enhancing the expression of HO-1, Nqo1, and Gst ya while acting as a potent antioxidant. Thus, these results suggest that AA may increase the antineoplastic effect of As^{3+} while providing protection to normal cells.

CLINICAL RESEARCH POSTERS

DEVELOPING EVIDENCE-BASED BEST PRACTICES FOR THE PRESCRIBING AND USE OF PROTON PUMP INHIBITORS IN CANADA

S. Singh, A. Bai, A. Lal, C. Yu, F. Ahmad, S. Rajbhandary, V. Shukla

Background The widespread and increasing use of PPIs made assessing their prescribing and use the first priority for the Canadian Optimal Medication Prescribing and Utilization Service (COMPUS). COMPUS used a unique and comprehensive process to examine the available evidence and ultimately generate best practice recommendations on the prescribing and use of PPIs.
Aim To ensure COMPUS best practice recommendations on PPIs are based on a comprehensive and thorough process of identifying and evaluating the available evidence.
Method Researchers at COMPUS, with input from stakeholders collected clinical practice guidelines (CPGs) and consensus documents (CDs) that met specific criteria on the use of PPIs for indications approved in Canada. Recommendations on PPIs were extracted and those addressing the same clinical question were grouped into a synopsis of existing recommendations. Researchers evaluated all relevant cited references for each grouping, and identified relevant new evidence from systematic reviews (SRs) and randomized controlled trials (RCTs) not yet incorporated into the CPGs. COMPUS also identified and evaluated relevant Canadian economic studies. To identify best practices, the evidence behind specific recommendations from guidelines were thoroughly assessed then complimented with new evidence and stakeholder feedback. A Review Panel with expertise in gastroenterology, family practice, clinical pharmacology, geriatrics, health economics, and methodologies will use this information to determine which recommendations can be considered “best practices” for the prescribing and use of PPIs in Canada.

Results Seventy guidelines on PPI use in GERD (including reflux esophagitis, Barrett’s esophagus), dyspepsia, and peptic ulcer disease (including NSAID-associated ulcer, *H. pylori* eradication) were identified, yielding 59 synopses of existing recommendations. Thirteen of the synopses cited good quality SRs as the highest level of evidence, seven cited poor quality SRs, 16 cited good quality RCTs, two cited poor quality RCTs, and 21 were based on expert or consensus opinion.
Implications for Pharmacists Pharmacists play a key role in influencing prescribing patterns and medication use. COMPUS will produce best practice recommendations for PPIs, as well as toolkits to help pharmacists and other healthcare providers successfully implement these recommendations in clinical practice. This will optimize the use of PPIs and improve health outcomes for patients.

EDUCATION AND TEACHING POSTERS

PREPARING FINAL YEAR PHARMACY STUDENTS FOR THE STRUCTURED PRACTICE EXPERIENTIAL PROGRAM

A.W. Lee, A.J. Cameron, L.A. Lavack

Objective To identify factors that influence the preparedness of final year pharmacy students for the structured practice experiential program (SPEP).
Methods Universities across Canada were surveyed to determine if sessions to prepare students for SPEP were conducted and the format of these sessions. Students and teaching associates (TAs) at the University of Toronto were also surveyed to get feedback about the student preparation sessions for SPEP and general preparedness of students. The student preparation sessions at the University of Toronto focused on the SPEP activities and assessment. Data was collected from graduating classes in 2005 and 2006.
Results Preliminary data from the surveys indicated that programs across Canada have various formats for preparation sessions. At the University of Toronto, TAs identified the syllabus as a useful tool, and stated that some students needed more preparation in the application of therapeutic knowledge (for institutional rotations) and knowledge of non-prescription products and herbals (for community rotations). Some students had difficulty recognizing the benefits of the preparatory lectures, while the website, syllabus and slide handouts of the preparatory sessions were found useful. The panel of TAs and a past student brought in for discussion had a modest impact on the students. Students expressed the need for better preparation for hospital rotations and more emphasis on therapeutics in the curriculum.
Conclusions There are many factors that affect the preparedness of students for SPEP rotations. These factors need to be taken in the context of the university curriculum and the student population when designing preparatory sessions for SPEP. Different modalities of delivering the needed information should be explored for optimal effectiveness and efficiency.

MOVING FROM A LECTURE-BASED TO A PROBLEM-BASED LEARNING CURRICULUM – PERCEPTIONS OF PREPAREDNESS FOR PRACTICE

A.M. Whelan, S. Mansour, P. Farmer, D. Yung

Objective In 1997/98 the Dalhousie University College of Pharmacy implemented an integrated problem-based learning (PBL) curriculum designed around desired educational outcomes. A comprehensive evaluation plan was designed to assess the curricular change from the lecture-based to the PBL curriculum. Perceptions of preparation for practice were examined by obtaining feedback from graduating students, preceptors and supervisors/employers.
Methods Three survey instruments were designed to obtain opinions regarding preparation for practice from graduating students, preceptors and supervisors/employers from 3 curricula: lecture-based, transitional and PBL. Graduating students and supervisors/employers were asked to rank how well they felt the 3 respective curricula

had prepared the graduates to confidently perform the 50 activities/competencies comprising the educational outcomes. Preceptors' opinions regarding the students' preparation for clinical performance and professional practices were also gathered.
Results The graduating students of the PBL curriculum perceived themselves to be equally or better prepared than did the graduating students of the other 2 curricula in many activities/competencies. Results from the preceptors and supervisors/employers did not identify any significant differences among the curricula with respect to the activities/competencies, or preparation for clinical performance and professional practice.
Conclusions Survey data indicates that the outcomes-based integrated hybrid PBL curriculum prepares students for practice as well as, or in several activities/competencies, better than, the traditional lecture-based curriculum.

THE PERFORMANCE OF INTERPROFESSIONAL AND UNIPROFESSIONAL TEAMS IN A PATIENT ASSESSMENT LAB

R. Dobson, J. Taylor, J. Cassidy, D. Walker, P. Proctor, J. Perepelkin

Purpose To report on the relative quality of the patient care plans produced by students working in different team types, as well as student expectations of, and experiences with different collaborative models.
Methods Students were assigned to work within one of three groups: pharmacy + nutrition + physical therapy, pharmacy + physical therapy, or pharmacy-only. The 90 minute assessment lab was conducted in a professional practice lab. A case study approach was used with trained patient-actors role-playing hospitalized patients newly diagnosed with a vertebral compression fracture. Together, each student group interviewed a patient-actor and developed a comprehensive care plan.
Results Students generally exceeded their expectations in terms of being able to effectively participate in the interview process, developing the care plan, and communicating effectively with both the patient and other team members. Nutrition and physical therapy students generally exceeded their expectations more than the pharmacy students. No significant differences were found between group types for recommendations made for calcium and vitamin D supplements, the use of a pharmacologic agent, or exercise. On average, interprofessional teams scored higher in terms of recommendations made for pain management, patient education, patient follow-up, global assessment of the care plan, and the total score obtained for the plan.
Implications The ability to work together collaboratively will be an essential skill within the evolving practice environment. By providing students with more opportunities to work with other health disciplines, their support for interprofessional activities, as well as their ability to work collaboratively, may be enhanced.

IMPLEMENTING AN ONLINE INFORMATION MANAGEMENT SYSTEM TO MEET THE EDUCATIONAL AND ADMINISTRATIVE NEEDS OF A COMPETENCY-BASED PHARM. D. CURRICULUM

G. Leclerc, M. Leblanc

Purpose Designing an online information system (GRIPE) to support collaborative management of competency-based curriculum, courses and clerkships within an extended learning and practice community.
Methods Since September 2004 a sequential process of preliminary needs analysis, case utilization review, conceptual analysis, dataflow and process planning lead to an iterative implementation and integration of online applications through data entry, process testing and validating by users.
Results Numerous meetings with users led to the design and implementation of GRIPE. Online applications were deployed sequentially based on prerequisite and links between them. Applications include management of clerkship sites, users and groups, curriculum and courses, learning content and objectives, online evaluation (knowledge and knowledge application, direct observation tool, competency profile, CQI), student academic profile and clerkship assignment process (including student eligibility to clerkship and immunization status). GRIPE was tightly linked to the institution academic applications avoiding data and process duplication. Web services were deployed assuring daily communication and data transfer between systems. Institution login procedure was used to define entry process to GRIPE environment. Role(s) or status within the institution and the curriculum were use to define user's system, applications and data access profile (students, faculty, staff members, preceptors, and others).
Conclusion The acceptability rate of a collaborative online course management environment is expected to be increased by adaptive training for groups or individual users and by online tutorials and learning resources availability.

PHARM. D. FIRST YEAR COMMUNITY CLERKSHIP: THE UNIVERSITY OF MONTREAL EXPERIENCE

E. Ferreira, G. Leclerc, T. Choquette, M. Dubois, V. Arseneault, J. Labrosse

Purpose Developing a first year community clerkship using innovative learning and evaluation tools centered on the competency-based Pharm. D. curriculum educational outcomes. Methods: Review of literature, analysis of current Pharm. D. clerkship programs, brainstorming sessions and team meetings with Faculty members, preceptors and community practice pharmacists, exchanges with community pharmacy chains and banners, professional services representatives, interactions with the Pharm. D. Implementation Committee, and consultations of pedagogical resources and experts.
Results A four-week clerkship in community pharmacy at the end of first year was developed. Based on the Pharm. D. first year curriculum, students will be evaluated by trained preceptors through specific community practice-oriented activities for practice management competencies, transversal competencies and pharmaceutical care competencies (management of simple immunology cases such as seasonal allergies). Two innovative tools were created to lead students and preceptors during the clerkship. Firstly the Student self-directed learning booklet is intended to support student's

development of specific practice oriented competencies. Secondly, the Direct observation evaluation form (DO) will facilitate seamless and continuous evaluation of competencies. The DO will be used during the clerkship for formative evaluations of practice-oriented activities, mid-stage and end-stage global assessments and for the Pharm.
D. student transversal competencies profile. This profile will allow monitoring and grading of transversal competencies. Trials and quality control assessments will assure that objectives are met and allow adjustments and improvements.
Conclusion A first-year community pharmacy clerkship was developed and will be implemented in 2007 using two innovative tools. Specific training sessions, on site visits and both paper and online resources, for preceptors and students, are planned to support the first year community clerkship implementation.

DOCTOR OF PHARMACY GRADUATES OF THE UNIVERSITY OF TORONTO: 11 YEARS EXPERIENCE

T.E. Brown, E. Ng, T.R. Einarson

Background The Doctor of Pharmacy program has been educating pharmacists to become advanced practitioners for over 10 years.
Aim To determine the contribution of graduates of the University of Toronto Doctor of Pharmacy Program, their professional activities and practice patterns.
Method A mail survey was sent to all 1994-2004 graduates, following a pre-notice mailing. Respondents were requested to complete the questionnaire and to attach a recent curriculum vitae. Reminder notices with another copy of the survey instrument were sent to non-respondents. Descriptive analyses (mean, SD, frequency count) were used to describe the data collected.

Results A response rate of 61% (n = 49) was achieved, with at least 1 member of each graduating class responding. Most were involved in direct patient care with many in mixed-practice settings (e.g., hospital, community, long-term care facilities, academia, industry and government). Professional activities included administrative/managerial duties, education, direct patient care and pharmacy-related research. As a group, the respondents have published approximately 343 publications as primary author and over 311 publications as co-authors. Types of publications range from articles in peer-reviewed journals to clinical practice guidelines, continuing education modules, and media spots. Together, respondents reported delivering over 800 presentations at professional/scientific meetings, industry-sponsored events, investigator meetings, grand rounds and physician advisory board meetings. Approximately half actively peer-review scientific journals and grant submissions. All together, the respondents hold over 150 peer-reviewed and non peer-reviewed grants totaling more than $10 million CDN. Many play a leadership role in their practices (research studies, chairs, team leaders and developers of new and innovative practice sites).
Implication for Pharmacists Doctor of Pharmacy graduates have made a significant contribution to health care through direct patient care, education and research.

THE EFFECT OF AN EDUCATIONAL INTERVENTION ON PATIENTS' PREFERENCES AND PERCEPTIONS ABOUT INSULIN THERAPY

J. Jurcic-Vrataric, L. Dolovich, L. Thabane, H.C. Gerstein, M. McInnes

Background Many people with type 2 diabetes have barriers to starting insulin therapy, resulting in prolonged periods of hyperglycemia and an increased risk of diabetes-related complications.
Aim The objective of this study was to determine whether a multifaceted interactive education strategy compared to a pamphlet education strategy affected intention to accept insulin therapy, attitudes about insulin and fear of injections.
Methods Patients with type 2 diabetes who were potential candidates for insulin therapy were recruited through family physician offices, and randomly allocated to early education (within 3 months) or delayed education (pamphlets then education after 3 months). The intervention included the following components: a personalized invitation letter from their family physician; a presentation on insulin delivered by a diabetes nurse educator; information about injection by demonstration and by personal experience; and an individualized patient summary sent to the family physician. The primary analysis conducted was the percentage of patients who were intending to accept insulin after education compared to those reviewing pamphlets. Other outcomes of interest were attitude about insulin measured with the Insulin Treatment Appraisal Scale and fear of injection measured with the Diabetes Fear of Self-Injecting Questionnaire.
Intent-to-treat analyses were conducted using the multiple imputation technique for missing data.
Results Thirty-six patients were randomized and 28 participants completed the study. After receiving the education or pamphlets, participants leaning toward accepting insulin were 10 of 15 (67%) in the education group, and 3 of 13 (23%) in the pamphlet group (χ^2=5.32, p=0.021). The educational intervention improved participants' attitudes about insulin more than the pamphlet strategy, but the difference between the pamphlet group and education group at follow-up was not statistically significant. The pamphlet groups' score was higher [7.61 (95% CI: 4.49,10.73)] than the education group's score [2.53 (95% CI: 0.10,4.96)] at follow-up for fear of injection (p=0.012).
Implications for Pharmacists An educational intervention addressing patient barriers to insulin therapy was found to be effective at increasing the likelihood of accepting insulin therapy and reducing fears associated with injection. Pharmacists should be aware of patient barriers to insulin therapy and can play an important role in recognizing and acknowledging these barriers.

COMPARISON OF SELF, PHYSICIAN, AND SIMULATED PATIENT RATINGS OF PHARMACIST PERFORMANCE IN A FAMILY PRACTICE SIMULATOR

E. Lau, L. Dolovich, Z. Austin

Background In recent years, pharmacists have expanded their scope of practice into the primary care setting. Clinical simulations, used as part of a pharmacists training program, provide pharmacists with an opportunity to learn knowledge and skills required specifically for primary care practice and to receive formative assessment on their

performance by physicians and simulated patients. The inter-rater agreement between pharmacist, physician, and patient assessors of pharmacists' primary care practice skills has not been well studied, but needs further investigation given that physicians and patients may have different expectations of a pharmacist's skills and role in primary care.
Aim To determine the inter-rater agreement between pharmacists, physicians, and simulated patients in rating pharmacists' primary care practice skills within a Family Practice Simulator.
Method During a one-day simulation of a family physician's office, nine pharmacist trainees rotated through a series of 13 OSCE stations where they interacted with physicians, standardized patients, nurses and office staff while completing primary care activities (chart review, patient interviews, physician consultation, documentation, inservice presentations). Pharmacists completed written self-assessments and received performance evaluations from physicians and/or standardized patients upon completion of each station. Pharmacists' performance ratings from self, physician, and standardized patient evaluations were compared using Global Rating Scales (GRS) and station-specific keypoints checklists.
Results The mean (SD) overall GRS score obtained by pharmacists across all FPS stations was 4.56 (0.60) from standardized patients, 3.95 (0.63) from physicians, and 3.60 (0.63) from self-assessment (out of a maximum score of 5). Agreement between pharmacists' and patients' GRS ratings ranged from moderate to good (G coefficient = 0.45 to 0.72). Agreement in GRS scores between pharmacists and physicians was at most fair in each station (G = 0.02-0.26). There was fair agreement on key points scores between pharmacists and patients (weighted kappa = 27%; 95% CI 7%, 47%) and moderate agreement between pharmacists and physicians (weighted kappa = 45%; 95% CI 21%, 70%).
Implications for Pharmacists Although there was at best moderate agreement in rating scores between pharmacists, standardized patients, and physicians, the FPS provided an important opportunity to measure expectations regarding the professional role, responsibilities, and performance of pharmacists from multiple perspectives. These results provide pharmacists with additional insight on how they could prepare for integration into primary care practice.

PHARMACY PRACTICE RESEARCH POSTERS

DEVELOPMENT OF CLINICAL INDICATORS OF PREVENTABLE DRUG-RELATED MORBIDITY IN TYPE 2 DIABETES

E.K. Black, N.J. M[ac] Kinnon, N.R. Hartnell, S. Halliday-Mahar, P. Dunbar, J. Johnson

Objective To develop a set of quality indicators (performance measures) of preventable drug-related morbidity (PDRM) for type 2 diabetes.
Methods In November, 2004, the four project partners (1. Dalhousie University - Faculties of Health Professions, Computer Science and Medicine, 2. The Nova Scotia Department of Health,
3. The Diabetes Care Program of Nova Scotia, and 4. Sobeys Pharmacy Group) identified priorities of medication-related diabetes care from the Canadian Consensus Guidelines using the Nominal Group Technique. Based on the priorities identified, a survey was developed containing a list of potential PDRM indicators for type 2 diabetes. This survey was the administered to an interdisciplinary expert panel of ten clinicians in diabetes care in summer 2005 in an attempt to generate consensus-based indicators through the use of the Delphi Technique.
Results Twenty-one consensus-based indicators were generated through the use of the Delphi Technique. Twelve of the 21 indicators were suggested by the expert panel members. Consensus was reached after three rounds of the Delphi Technique.
Conclusions The indicators developed will be used to measure the quality of medication use for diabetes. In the second stage of this study, six of 21 clinical indicators approved by the expert panel will be operationalized in a web-tool to be used at the point of care. They will be tested for feasibility over a three-month time period in two Sobeys Pharmacy Group community pharmacies

HOME-VISITING PHARMACISTS' IMPACT ON ELDERLY CLIENTS IN SCARBOROUGH

K. Cameron

Background The Scarborough Community Care Access Centre is in the second phase of the medication management support service for elderly clients in Scarborough (Toronto). It builds on the pilot project in 2003-04, which evaluated and confirmed the feasibility of a home-care based medication management model.
Aim To evaluate the impact of visiting pharmacists' services on client outcomes, including ability to manage medications, and positive changes in pain, depression, IADL/ADL, falls, health care utilization and caregiver burden.
Method At initial home visits, the pharmacist assesses clients' current medications, medication history, lifestyle and medical conditions, identifying medication-related problems (MRPs) and potential solutions. The Pharmacist then proceeds to solve the problems, collaborating with the clients, their physicians, caregivers, community pharmacists, and other health care providers. Baseline-data on pain, depression, IADLs/ADLs, falls and health care utilization is collected using the RAI-HC tool at initial and discharge assessments.

Results From July 4, 2005 to March 6, 2006, 223 referrals were received; 179 clients had the initial home assessment. In a very early client sample (n=56), 50 percent of clients were 80 years or older, most taking six to 15 daily medications. Physicians responded to pharmacist recommendations in 81% of cases. Clients had between one and nine MRPs (average four); 69% of MRPs were resolved. The early results indicate positive trends in IADLs/ADLs and reduction in caregiver burden and hospitalizations. Clients and referring agents indicate a high level of satisfaction.
Implications for Pharmacists Expansion of pharmacy services from retail and hospitals to clients' homes elevates the pharmacists' direct patient-care role to a new level. As more home care, primary care and community organizations adopt this model, pharmacists will maximize their skills for comprehensive client service.

COLLABORATIVE WORKING RELATIONSHIPS BETWEEN FAMILY PHYSICIANS AND PHARMACISTS: CHANGES OVER TIME AS PHARMACISTS INTEGRATED INTO FAMILY PRACTICE

B. Farrell, K. Woodend, K. Pottie, V. Yao, L. Dolovich, N. Kennie, C. Sellors

Background Collaborative working relationships (CWR) may be influenced by many factors as health care professionals learn to work together in the primary care setting.
Aim This study used a quantitative questionnaire to evaluate change over time in CWR and predictors of change as 7 pharmacists integrated into 7 family practice settings in the Ontario IMPACT (Integrating family Medicine and Pharmacy to Advance primary Care Therapeutics) project.
Methods A CWR questionnaire previously validated with family physicians and community pharmacists (covering a variety of participant variables, professional interactions, exchange characteristics and collaborative practice) was administered at the 3rd and 12th month of pharmacist integration. Family physicians completed the questionnaires considering their practice pharmacist and pharmacists completed questionnaires regarding each physician with whom they worked. Paired sample T tests were conducted for physician-completed questionnaires. Effect sizes were calculated for each pharmacist and meta-analytically combined. Hierarchical linear regression analysis was performed to identify significant predictors of collaborative relationship development.
Results Response rates were 87% and 88% for the two survey administration times. Paired sample t test revealed significant increase in physicians' collaborative practice score ($P<0.05$) over time. Regression analyses showed significant predictors (eg. role specification) of the development of collaborative working relationships at the 12 month point. Meta-analytically combined effect sizes of the pharmacist-completed questionnaires showed small positive effects in four variables and a large negative effect in one variable.
Implications for Pharmacists We successfully used this questionnaire to measure CWR between pharmacists and physicians working together in family practice and to evaluate change over time. Role specification as a predictive factor of CWR development highlights the importance of clear roles and responsibilities as pharmacists integrate into family practice.

INTEGRATING A PHARMACIST INTO FAMILY PRACTICE: QUALITATIVE RESULTS FROM THE INTEGRATING FAMILY MEDICINE AND PHARMACY TO ADVANCE PRIMARY CARE THERAPEUTICS (IMPACT) STUDY

B. Farrell, K. Pottie, S. Haydt, L. Dolovich, N. Kennie, C. Sellors

Background Optimizing drug therapy in a world of polypharmacy for chronic diseases, preventable adverse drug events, and increasing drug costs requires fresh approaches. One such approach is the integration of a pharmacist into family practice. Seven pharmacists, selected for clinical and interdisciplinary experience, and for potential to succeed in a new role integrated into seven physician-led family practices in Ontario. Each practice was actively moving toward a group practice model incorporating allied health professionals, patient-rostering and prevention bonuses. Integrated pharmacists provided patient medication assessments, drug information, academic detailing and developed office system innovations to optimize drug therapy.

Aim Examine the experiences of pharmacists and physicians during the implementation of the IMPACT program. Delineate factors that facilitate and hinder the integration process.

Method Qualitative design using pharmacist narrative reports and key informant interviews with physicians. Data was analyzed by four independent researchers with varied backgrounds, using immersion and crystallization to identify codes and iterative grounded theory to determine process and content themes.

Results Pharmacists characterized the integration process as an emotional "rollercoaster," complete with successes (feeling valued and contributing concretely to patient care), frustrations (feeling underutilized) and fears (being a nuisance, working too slowly). Pharmacists relied on various adaptive strategies and practical demonstration of their potential value to physicians to facilitate their integration process. Pharmacists identify mentors, allied health professionals and accommodating doctors as key supports. System supports included office space promoting accessibility, communication tools, and participation in practice meetings or education sessions. Physicians' initial concerns (medical legal implications and workflow issues) decreased markedly as physicians began to know and appreciate the role of the pharmacist. A key challenge for physicians was adapting long-established routines. Important system level supports included office space and activities to promote physician-pharmacist communication, such as pharmacist participation in practice meetings.

Implications for Pharmacists The integration process was both challenging and rewarding for the integrating pharmacists and physicians. Adaptability and practical demonstration of potential utilization and benefit were crucial in physician uptake of the pharmacist's services. Increased understanding and appreciation of roles allowed for productive interactions.

COMMUNITY MEDICATION SAFETY THROUGH PATIENT EDUCATION: ROLE OF A 24/7 TELEPHONE MEDICATION ADVICE SERVICE

R. Kaczowka, I. Vicas

Background Medication safety is a tri-lateral partnership between the patient, the physician and the pharmacist. The Institute for Safe Medication Practices Canada (ISMP), identifies PATIENT EDUCATION as a core distinguishing characteristic of a safe medication system. Since patients take OTC, herbals and prescription medications, alone or in combination, patient contributions to medication safety present a real risk. Teaching moments often present themselves during the course of treatment. However, in the community, patient access to their primary care practitioner (pharmacist, physician) may be limited for a variety of reasons, particularly outside the available hours of a patient's primary care practitioner.

Aim Medication safety efforts have primarily focused on hospital-based/health provider/system issues. The purpose of this poster is to demonstrate how a specialized telephone medication/herbal advice service can identify safety gaps and enhance medication safety in the community through timely advice and patient education delivered in real time over the telephone, by credible specialized experts (primarily pharmacists).

Method Cases were derived from calls received to a provincially operated 24/7 medication and herbal telephone advice line. A representative sample of cases were analyzed to (1) identify medication safety issues, (2) classify the nature of the interventions required, and (3) describe the resultant patient education opportunities.

Results Medication safety issues identified include: inadvertent ingredient duplication with potential toxicity, premature discontinuation of medication, ADR's, drug/herbal interactions, inappropriate diagnosis. The nature of professional interventions were classified as: managing or reducing safety risks, optimizing medication benefits, referral for physician assessment, managing unrealistic expectations, recognizing CAM in the risk assessment. The resultant patient education opportunities include: optimizing rational medication use or medication selection, reading labels to avoid inadvertent toxicity, enhancing the benefits of adherence/compliance. Case examples can illustrate each of these components.

Implications for Pharmacists Community pharmacists are positioned to recognize patient contributions that may adversely affect medication safety. A patient well educated about their medications enhances medication safety. Medication advice and patient education delivered via a 24/7 telephone advice line can enhance medication safety by recognizing and immediately addressing education gaps.

DATA ANALYSIS OF CALLS AND CHARACTERISTICS OF CALLERS TO A 24/7 TELEPHONE MEDICATION ADVICE SERVICE FOR THE PUBLIC

R. Kaczowka, I. Vicas

Background A 24/7 medication and herbal telephone advice service offered province-wide was designed to supplement information and advice provided by the caller's pharmacist or physician. Calls are handled by qualified, experienced pharmacists and nurses. All advice provided is evidence based scientific information, personalized for the individual caller. Data collection and analysis is critical to understanding how best to serve clients' needs.
Aim To analyze the data collected by the medication and herbal advice service in order to understand who is using the service and how the service is being used, so client needs may be met.
Method For every call received to the service, a chart is generated and data collected. This data is then entered into a database program. Data from the start of the service in June 2002 through to December 2005 were analysed for characteristics including geographic distribution, caller-patient relationship, patient demographics, reason for calling, medications and herbals involved, medication issue of concern, patient disposition. Service workload and performance parameters were examined including time to respond, time distribution of calls.
Results Over 34,000 calls were handled. Call volume increased dramatically over time, with increasing awareness of the service. The medication issues of concern included: drug interactions (20-23%), ADR's (16-17%), administration /dosing (13-14%), breastfeeding (1316%), pregnancy (14%) and therapeutic issues (10-11%). Patients were referred to primary care practitioners (pharmacist or physician), emergency department, or the poison centre in 7 - 12% of calls – 4-6% required urgent referral. Approximately 30% of calls were received between 2100hr. and 0900hr., when the majority of pharmacies are closed. Callers' issues were handled during the initial phone call 77-85% of the time.

Implications for Pharmacists An understanding of the public's medication issues identified through a 24/7 telephone advice service better enables pharmacists to predict and respond to the needs of the community.

USER EVALUATION OF A PUBLIC MEDICATION TELEPHONE ADVICE SERVICE

R. Kaczowka, D. Renfree, I. Vicas

Background A 24/7 medication and herbal telephone advice service offered province-wide was designed to supplement information and advice provided by the caller's pharmacist or physician. Calls are handled by qualified, experienced Information Specialists, primarily pharmacists. All advice provided is evidence based scientific information, personalized for the individual caller. Service evaluation is a critical component of quality improvement.
Aim The evaluation tool selected was a user satisfaction survey. Its purpose was (1) to assess customer satisfaction with service deliverables; (2) to explore client perceptions of the value of the service; (3) to seek suggestions for improvement.

Method A single researcher delivered a 10 minute, 22 question survey by telephone. The survey included open and closed ended questions and Liekert scales. Recent callers (between April 1, 2005 and June 30, 2005) were randomly selected in numbers proportional to the geographic distribution of callers to the service from each of the 9 health regions. Total sample size was 100 users. Parameters investigated included timeliness of response, completeness, awareness and interaction with the Specialist. Narrative comments were also documented.
Results To obtain the target sample, 503 calls were made to a sample size of 317 callers. Twenty callers refused to participate. The most common reason for initiating contact was unavailability of the pharmacist or physician, followed by client desire for additional information. Their question was answered immediately 79% of the time. Of those who experienced a delay, 85% were satisfied with the turn around time. 85% of callers were confident with the knowledge level of the information specialist; 93 % understood the information provided; 89% followed the advice provided; 73% found the advice important in their self-care decision process; 93% indicated the service met their expectations; 96% would recommend the service to others.
Implications for Pharmacists The general public views very favorably a telephone advice service responding to their medication and herbal information needs. It is a viable alternative to providing face-to-face client advice. With appropriate resources, this form of communication would allow pharmacists to provide rapid client response in a confidential environment.

THE CLINICAL PHARMACOTHERAPY PRACTITIONER ROLE IN THE NOVEL MULTIDISCIPLINARY CARDIAC EASE (ENSURING ACCESS AND SPEEDY EVALUATION) PROGRAM

S.L. Koshman, T.J. Bungard, S.L. Archer, T. Hogan, L. Lalonde, M. Smigorowsky, G.J. Pearson

Background The Cardiac EASE program was designed to improve access and efficiency of tertiary cardiology consultative services for non-urgent referrals by a establishing a single point of entry and utilizing the unique knowledge and skills of a multidisciplinary team.
Aim To describe the unique role of the pharmacist in a tertiary care cardiology consultative service, in a novel multidisciplinary rapid response clinic.
Methods The Cardiac EASE team consists of cardiologists, nurse practitioners (NP), Doctor of Pharmacy trained clinical pharmacotherapy practitioners (CPP), and support staff. All patients referred are triaged by an intake team, which arranges appointments and diagnostic tests, prior to or on the day of the clinic visit. In clinic, each patient is seen by either a CPP or NP, who completes the initial history and physical exam and presents their case to the cardiologist with recommendations. The cardiologist reviews the patient with the CPP or NP, discusses the plan and completes documentation while the plan is implemented.
Results Currently, a CPP practices in the clinic 3 of 4 clinic days/week. The clinic also serves as the primary practice for a Clinical Postdoctoral Fellow. Of 545 patients assessed in the clinic since July 2005, 32% were initially assessed by a CPP. The most common referral indications include chest pain (38.1%), arrhythmias/palpitations (26.9%), and dyspnea (7.8%).
Implications for Pharmacists This collaborative practice provides a unique opportunity for pharmacists to participate directly in patient management through history taking,

physical examination and implementing recommendations for pharmacotherapy, while shortening wait-times for cardiologist consultation.

THE OMINOUS PROBLEM OF MEDICATION NON-ADHERENCE AND IMPLICATIONS FOR CHANGE OF PRACTICE FOR PHARMACISTS

W. McLean

Background The literature on adherence interventions is large and requires evaluation. Review of the impact of one specific program, Health Inform by Rx Canada, provided the opportunity to integrate findings with evaluated literature. Recognition of the barriers facing pharmacists and conjecture on how practice can be changed to incorporate such programs are entertained.
Aim The goal was to measure the impact on persistence of the Health Inform program compared to non-participants, from prescription data; based on the findings of this analysis and of a literature review on other interventions, recommendations will be formulated for changes in pharmacy practice.
Method Prescription data from 2100 pharmacies participating in the Health Inform drug/disease education program were gathered for 11 months of 2005 and prescription renewals and persistence data were gathered. For consenting patients, Health Inform provides six mailings on the drug and the disease over 18 months. The literature review involved MedLine searches from 1995-2005 for keywords adherence, concordance and compliance.
Results Prescription data were collected for over 911,000 patients for 12 Health Inform programs. Persistence was, on average, 11% greater at 12 months in the Health Inform group compared to those not receiving the materials. The literature search provided evidence of relatively weak effects of several interventions: counselling, patient education materials (such as our study), and telephone call backs. However, several contextual approaches have even greater impact including use of several interventions, the assessment of preparedness for change, use of intervention repeated every two months and the assessment of patients' attitudes. Evidence suggests that specific individualized interventions in a pharmaceutical care format can make the greatest difference in adherence rates, and specifically improve persistence percentages for chronic medications.
Implications for Pharmacists This study and the literature review clearly encourage pharmacists to increase their awareness of the problem and to individualize with one or more proven appropriate interventions. The provision of pharmaceutical care, including assessment of readiness for change and of health beliefs, clearly provides maximum health benefits. New models of practice with appropriate reimbursement incentives must be developed to foster such interventions and to thereby decrease the massive wastage of health care dollars.

SOCIAL AND ADMINISTRATIVE RESEARCH POSTERS

PHARMACIST INITIATED PRIOR APPROVAL

J. Perepelkin, R. Dobson

In 1999, Saskatchewan Health sanctioned licensed pharmacists in the province to initiate Exception Drug Status (EDS) requests, also referred to as prior approval, on behalf of their patients.
Objectives To obtain pharmacists' opinions about the benefits of the program to stakeholders, and to identify factors associated with pharmacists initiating a request.
Method In the fall of 2004, a census of community-pharmacy managers in Saskatchewan was conducted using a self-administered postal questionnaire.
Results A response rate of 83% was achieved. A majority of respondents (63%) agreed or strongly agreed the EDS program benefited patients and the Drug Plan (64%). Only 15%, 37% and 39% of respondents agreed or strongly agreed EDS benefits pharmacists, physicians and the health care system respectively. The time required to submit an EDS request was an important or very important factor for only 39% of respondents, as opposed to the ability of the pharmacist to obtain the required information to initiate the request (77%), and their ability to contact the prescribing physician (70%). The majority of respondents agreed or strongly agreed that changing the policy in 1999 was beneficial to patient care (71%), and that the change in policy contributed substantially to their administrative workload (87%).
Conclusion Results of this study indicate community pharmacy managers in Saskatchewan acknowledge that the EDS process is beneficial for their patients. While pharmacists were supportive of the benefits of an EDS program, their apprehensions towards the program lie in the administrative processes, particularly in obtaining the required information, from physicians, to submit a claim. There is also concern with the methods pharmacists must use to apply for EDS, which can be burdensome and prolong the administrative process.

RÉFLEXIONS SUR UN MODÈLE DE GESTION ET D'APPROBATION DES ORDONNANCES COLLECTIVES EN ÉTABLISSEMENT DE SANTÉ

S. Doyon, J.F. Bussières

Objectif Cet article décrit un modèle de gestion et d'approbation des ordonnances collectives (OC) en établissement de santé.
Méthode À partir d'une revue de la documentation, d'une enquête menée auprès de 13 établissements (02-2006) et de discussions avec le comité local d'implantation de la réforme professionnelle, nous proposons un modèle conceptuel de gestion des ordonnances.
Résultats Avec un taux de réponse de 92 % (12/13), on note les constats suivants: 7/12 ont mis en place un comité actif d'implantation de la *Loi 90* où un pharmacien est impliqué; on note une variance du nombre d'OC active (0-200) et de la proportion de ces OC comportant des médicaments (20-100 %); la structure d'approbation inclut le comité de pharmacologie (5/12), le Conseil des médecins, dentistes et pharmaciens (9/12) et

d'autres comités. Peu d'établissements ont statué sur les modalités définitives d'émission/gestion des OC; en dépit de l'obligation légale d'inscrire le numéro de permis de pratique du médecin, seul un établissement l'exige; de même 4/12 exigent le numéro de pratique de l'infirmière ou d'un autre professionnel visé par une OC; les modalités de diffusion varient grandement. Enfin, on note un niveau d'accord variable quant à l'opportunité que représente la *Loi 90* pour les pharmaciens. Un modèle schématique est présenté, incluant 10 recommandations touchant la pharmacie.
Conclusion Il existe peu de publications sur les modèles de gestion des ordonnances collectives en établissement de santé. Cette réflexion propose un modèle de gestion.

MISE EN PLACE D'UN PROTOCOLE DE SUIVI DE LA CONTAMINATION ENVIRONNEMENTALE DANS UNE PHARMACIE SATELLITE D'HÉMATO-ONCOLOGIE

J.F. Bussières, Y. Théorêt, S. Prot-Labarthe, D. Larocque

Objectif L'objectif de cette étude est de mettre en place une évaluation en routine de la présence de médicaments cytotoxiques sur différentes surfaces d'une pharmacie satellite 'hémato-oncologie.

Méthode Le médicament cytotoxique choisi a été le méthotrexate en fonction de son importante utilisation dans notre unité et de l'expertise locale de l'équipe de biochimie de l'établissement permettant un dosage en routine. Des frottis ont été réalisés durant une année et de façon hebdomadaire sur cinq surfaces: surface extérieure de la hotte, combiné du téléphone, poche de soluté, comptoir de travail et plancher de la salle. Un témoin positif (méthotrexate 0,1 microM) et négatif (eau stérile) ont également été réalisés. Le méthotrexate a été dosé par HPLC (Agilent 1050 HPLC, autoinjecteur et détecteur fluorimétrique Agilent 1100) avec photooxydation post-colonne par rayon ultraviolet et détection par fluorimétrie.
Résultats Durant l'année 2005, 199 prélèvements (en excluant les contrôles) ont été réalisés durant 40 semaines. Quatre prélèvements sont revenus positifs soit 2,0% des frottis effectués. Les quatre prélèvements positifs ont tous été réalisés durant la première moitié de l'année, avant que les points de calibration de la méthode n'aient été modifiés pour obtenir une limite de détection plus fiable.
Conclusion Il est possible d'effectuer des dosages de routine de cytotoxiques sur les surfaces d'une pharmacie d'hémato-oncologie. C'est avec la collaboration de l'équipe de la biochimie que ces dosages sont réalisables, dans l'intérêt du personnel exposé lors de la préparation de cytotoxiques.

ÉVALUATION DE L'EXPOSITION PROFESSIONNELLE AUX CYTOTOXIQUES DANS UNE PHARMACIE SATELLITE D'HÉMATO-ONCOLOGIE

J.F. Bussières, P.J. Sessink, S. Prot-Labarthe, D. Larocque

Objectif L'objectif de cette étude est d'évaluer la présence de médicaments cytotoxiques sur différentes surfaces d'une pharmacie satellite d'hémato-oncologie et d'évaluer la conformité du processus de préparation aux normes de pratique.
Méthode Le programme d'hémato-oncologie du centre hospitalier universitaire Sainte-Justine à Montréal, Québec, possède une pharmacie satellite du département de pharmacie pour la préparation des cytotoxiques. Des échantillons de six surfaces ont été prélevés avec la méthode Exposure Control® (surface du plan de travail, grille frontale et fenêtre extérieur de la hotte, sol devant la hotte, comptoir de vérification terminale et la fenêtre du réfrigérateur) pour évaluer la présence de cyclophosphamide, ifosfamide, méthotrexate, étoposide et sels de platine. Nous avons réalisé une auto-évaluation quant à la conformité de nos pratiques de préparation cytotoxiques par rapport aux normes USP-797 et NIOSH.
Résultats On note une contamination limitée de la pharmacie satellite avec présence de cyclophosphamide sur le plan de la surface de travail de la hotte et sur la grille frontale de cette hotte et de sels de platine à la limite du seuil de détection sur toutes les surfaces. Les autres prélèvements sont négatifs. L'analyse de conformité révèle une conformité globale de 59% pour USP 797 et 54% pour NIOSH.
Conclusion Bien que la conformité des pratiques de préparation de médicaments soit inférieure à 60 % par rapport aux deux normes, on note une contamination environnementale ponctuelle très limitée avec des agents cytotoxiques dans la pharmacie satellite d'hémato-oncologie.

ÉVALUATION BIOMÉCANIQUE DES CONTRAINTES PHYSIQUES ASSOCIÉES AUX PRÉPARATIONS STÉRILES DANS UN DÉPARTEMENT DE PHARMACIE HOSPITALIÈRE

J.F. Bussières, D. Marchand, S. Prot-Labarthe, J.M. Forest, J. Bleau

Objectif: On a mené une analyse ergonomique a mesuré des contraintes physiques associées aux préparations stériles en pharmacie.
Méthodologie L'électromyographie de surface est utilisée pour évaluer le pourcentage d'utilisation musculaire (PUM) associée à 38 manipulations répétées par 6 assistantes techniques. 3 types d'enceintes de préparations ont été étudiées : microenvironnement (ME) à manchon et membrane souple (A), hotte avec fenêtre rigide (B) et ME avec manchon et paroi rigide (C). Les muscles bi-latéraux étudiés étaient : deltoïde antérieur, extenseurs communs des doigts, érecteur du rachis et trapèze supérieur.
Résultats 22 manipulations comportant ≥ 10 observations sont retenues pour analyses. Les PUM moyens > 10% concernent 7,1% des mesures réalisées dans les enceintes de type A, aucune dans les enceintes de type B et 10,9% dans les enceintes de type C. Le

PUM moyen a été > 10% à au moins une reprise pour chacun des types de muscles étudiés, mais à plus de 2 reprises pour le deltoïde antérieur gauche et l'érecteur du rachis gauche. Parmi les 6 PUM moyens > 10% liés à l'utilisation de seringue, 4 concernent les seringues de volume plus important (60 mL). Cette étude démontre que les PUM statiques sont supérieurs au seuil idéal de 5 % dans les 3 types d'enceinte.
Conclusion Il existe peu de données publiées sur l'ergonomie des manipulations stériles en pharmacie. D'autres études sont nécessaires afin de comparer l'ergonomie du travail sous hotte à flux laminaire et ME.

GESTION DES RAPPELS ET RETRAITS DE MÉDICAMENTS EN ÉTABLISSEMENT DE SANTÉ

J. Gauthier, J.F. Bussières

Objectif L'objectif de cet article est de décrire une démarche de mise à niveau de la gestion des retrait de lots de médicaments (RLM) en établissement de santé.
Méthode À partir d'une revue de la documentation, d'une collecte des RLM depuis janvier 2005, d'une analyse de la problématique et d'un cas type, on a proposé un modèle de gestion administrative et clinique.
Résultats On a procédé à la rédaction de politiques et procédures précisant les obligations légales, les lignes directrices de Santé Canada, les modalités de diffusion de l'information provenant des fabricants et des distributeurs, les étapes de gestion interne incluant la description des tâches, la structure de la base de données ajoutée à l'intranet, les modalités d'affichage web et interactive, les modalités d'interface avec le logiciel pharmacie et incluant une fiche de suivi. La démarche proposée comporte 5 étapes, (1) impression de la fiche-suivi et inscription des paramètres de base (i.e. date/heure, nom du fabricant, nom du médicament, #lot, date de péremption); (2) prise en charge par technicien en administration/pharmacien (3) tournée des stocks (réserve, distribution, réserves d'étage, casiers de patients) (4) ségrégation des stocks et retour au fabricant (5) saisie de la fiche-intranet (numérisation de l'avis en format PDF), envoi par courriel aux médecins/infirmières et archivage papier et divulgation.
Conclusion Il existe peu de publications sur la gestion des RLM en établissement de santé. Cette démarche structurée peut influencer la pratique en établissement de santé.

MISE EN PLACE D'UN PROTOCOLE DE VALIDATION MICROBIOLOGIQUE EN HÉMATO-ONCOLOGIE

J.F. Bussières, D. Larocque, S. Prot-Labarthe

Objectif Cette étude est décrit la mise en place et les résultats d'un protocole de validation microbiologique dans une pharmacie satellite d'hémato-oncologie.
Méthodologie Nous avons établis un protocole de validation microbiologique hebdomadaire permettant le contrôle de l'air de la hotte par sédimentation.
Résultats Le protocole a été testé au début de 2005 et mis en place sur une base hebdomadaire en avril 2005. Nous présentons les 20 premières semaines d'application du protocole. On note un taux moyen de croissance de microorganismes de 5,0 %. Les

taux de croissance varient selon les hottes testées (différence dans le type d'évacuation, la fréquence d'utilisation de chacune des hottes et leur emplacement dans la salle de préparation stérile). Parmi les agents identifiés, on note une colonie de *bacillus sp.* à trois reprises, une colonie de *penicillium sp.* à une reprise, une colonie de *staphylococcus coagulase* négative à une reprise et un champignon filamenteux à une reprise. La procédure nécessite un temps total de 30 à 40 minutes et est réalisée par un assistant-technique sénior en pharmacie.
Conclusion Au Québec, peu d'établissements de santé ont un protocole de validation microbiologique en pharmacie. Cette étude illustre l'implantation d'un protocole dans un centre hospitalier tertiaire.

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