# Awards Presentations at 2003 Professional Practice Conference

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**Bristol-Myers Squibb Award**
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**GlaxoSmithKline Award**
*Pharmacy Administration*
Chole A. Campbell, Charmaine A. Cooke, Swarna D.S. Weerasinghe, Ingrid S. Sketris, Pam R. McLean-Veysey, Chris D. Skedgel
Topical Corticosteroid Prescribing Patterns Following Changes in Drug Benefit Status

**GlaxoSmithKline Award**
*Pharmaceutical Care*
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Integration of a Pharmacist into a Multidisciplinary Geriatric Assessment Clinic: Does Better Communication of Drug-Related Problems and Related Recommendations to Community Caregivers Enhance the Care of Clinic Clients?

**Mayne Pharma**
*Oncology*
G. Dranitsaris, W. Hanna, B. Norris, F. O'Malley, K. Gelmon
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**Merck Fross Award**
*Rational Drug Use*
Vivian W.Y. Leung, Rubina Sunderji, Peter J. Zed, Ken Gin
Switching from Abciximab to Eptifibatide for Percutaneous Coronary Interventions: A Local Analysis (SWAP Study)

**Novartis Award**
*Pharmacoeconomics*
Carlo A. Marra, John M. Esdaile, Aslam H. Anis
Practical Pharmacogenetics: The Cost-Effectiveness of Screening for Thiopurine S-Methyltransferase (TPMT) Polymorphisms in Patients with Rheumatological Conditions Treated with Azathioprine (AZA)

**Novopharm Award**
*New Programs in Patient Counselling—Papers or Audio Visuals*
Fran Paradiso-Hardy, Angie Giotis, Patti Madorin, Nancy Moore
Development, Implementation, and Evaluation of a Cardiovascular Medication Education Audiovisual Program

**Pfizer Award**
*Long-Term Health Care*
Charles Bayliff, Vanessa Barron, Richard Malthaner, Sanjay Mehta
Pharmacist's Contributions, Prescribing Practices, and Workload Measurement in an Outpatient Thoracic Rehabilitiation Program

**Pharmascience Award**
*Patient Care Enhancement*
Sarah Connelly, Deborah Yoong, Janet Martin, Kelly Zarnke, Charles Bayliff, Kim Delamere, Santosh Deshpande
Seamless Care: Evaluating the Impact of a New Discharge Prescription Form

**Roche Award**
*Specialties in Pharmacy Practice*
Anne Dar Santos, Karen Shalansky, J. Jastrzebski
Multidisciplinary Approach to Erythropoietin Resistance in a Hemodialysis Unit

**Sabex Award**
*Palliative*
Dominique Martel, Claudine Laurier, Jean-François Bussières, Denis Lebel, Sandra Kish, Albert Moghrabi
A Profile on the Use of Alternative and Complementary Therapies in Children with Cancer

**Schering Award**
*Pharmacokinetic or Hospital Pharmacy—Industry Relations Research*
Sharon M. Yeung, Scott E. Walker, Sandra A.N. Tailor, Linda Awdishu, Sheldon Tobe, Teraiza Yassa
Pharmacokinetics of Oral Ciprofloxacin in Non-Infected Patients on Continuous Cycling Peritoneal Dialysis

## Facilitating Delivery of Continuing Pharmacy Education via Streaming Media in a Large Canadian Tertiary Care Teaching Hospital

*Apotex Award*

*Elaine Chong, Robert M. Balen*

**Background:** Over 70 contact hours of live continuing education seminars are presented annually to members of our pharmacy department. Only a small proportion of all invitees are able to attend due to scheduling and traveling barriers.

**Objectives:** To enhance access to continuing education content by developing a process for recording live presentations and making them available for viewing via streaming media through the Internet and hospital local area network (LAN).

**Methods:** Desired streaming media content authoring product features were delineated and seven criteria were generated. Literature and Internet searches were conducted to identify streaming media authoring software that would meet these criteria. Lecturers provided educational content consisting of slides in PowerPoint™ format. Live audio was recorded in real time during scheduled presentations using a microphone and the "record narration" function of PowerPoint™. After conversion to streaming media format using the selected authoring software, files were published to the department Internet site and copied to a shared directory on the hospital LAN. Playback was tested form both sources on a variety of computer configurations. The minimal computer configuration consisted of a 266 MHz Pentium I processor with 64 MB of RAM, using Windows 98 and Windows NT 4.0 operating systems. Both Netscape 4.05 and Internet Explorer 5.5 web browsers were tested for playback ability over broadband and 33.6 Kbps modem connections.

**Results:** Twelve software products were identified. One product, Impatica for PowerPoint™ met the seven a priori criteria. Ten presentations were recorded and converted to streaming media format. Playback was satisfactory from all sources on minimal computer configurations at both connection speeds. No conflicts with existing corporate computer and Internet browser configurations were encountered. Feedback from viewers has been positive.

**Conclusion:** Streaming media is a viable option to improve access to internal seminar-style educational content. Delivery of this content via PC and the hospital LAN or Internet is a low production cost method that permits simple playback using standard PC configurations.

## A Randomized Controlled Trial Comparing the Quality of Oral Anticoagulant Monitoring by Anticoagulation Clinics with Family Physicians

*Baxa Award*

*S. Jo-Anne Wilson, Philip S. Wells, Michael J. Kovacs, Geoffrey M. Lewis, Janet Martin, Erica Burton, David R. Anderson*

**Background:** There is growing evidence that better outcomes are achieved when anticoagulation is managed by anticoagulation clinics compared to family physicians. However, there have been no randomized controlled trials to evaluate these two models of anticoagulant care.

**Objective:** To evaluate the quality of oral anticoagulant management by comparing the proportion of time patients receiving warfarin sodium have their international normalized ratio (INR) within the targeted range while managed in anticoagulation clinics versus family physicians care. To estimate the rates of thromboembolic and major hemorrhagic events, and patient satisfaction in the two groups.

**Design:** Randomized, controlled multi-centre trial conducted January 1998 to September 2000, with a three-month follow-up period.

**Setting:** Anticoagulation clinics were located in three Canadian tertiary referral academic medical centres and family physician practices were located in the surrounding communities.

**Patients:** 221 patients expected to require warfarin sodium for three-months. 41 patients refused to participate.

**Interventions:** All patients were evaluated by a hematologist and a clinical pharmacist and received a standardized educational session. Warfarin sodium dosing was performed by the anticoagulation clinics for the first week until INRs were reasonably stable. Patients were then randomized to either continue with the clinics or have anticoagulation management assumed by their family physicians. All INR tests performed over the subsequent three-month period were recorded. Patients were contacted monthly to confirm INR tests, identify interruptions with therapy and potential thromboembolic or bleeding events.

**Measurements:** Proportion of time the INR was within the targeted therapeutic range (0.2 INR units (expanded therapeutic range) over three-months. Rates of thromboembolism and major bleeding as determined by a centralized adjudication committee. Patient satisfaction was determined by a questionnaire.

**Results:** Of the 221 patients enrolled, 112 were randomly assigned to anticoagulation clinics and 109 to family physicians. Patients managed by anticoagulation clinics were within the expanded therapeutic range 82% of time versus 76% of time for family physicians ($P = 0.03$). Panic INR values (<1.5 or >5.0) were more commonly observed in patients managed by family physicians (40%) than anticoagulation clinics (30%, $P < 0.01$). More INR measurements were performed by family physicians than anticoagulation clinics (13.0 versus 11.0, $P < 0.01$). Major bleeding events [2 (1.8%) versus 1 (1.0%)], thromboembolic events [1 (0.9%) versus 2 (1.8%)], and deaths [5 (4.5%) versus 6 (5.5%)] occurred at similar frequency in the anticoagulation clinics and family physician groups, respectively. Of the 170 (77%) patients who completed the patient satisfaction questionnaire, more were satisfied when their anticoagulant management was managed through anticoagulation clinics than using their family physicians ($P < 0.01$).

**Conclusion:** Anticoagulation clinics provided better oral anticoagulant management compared to family physicians. Further studies of longer duration are required to determine whether anticoagulation clinics improve patient outcomes and are cost-effective.

## Assessing the Guidelines for Potassium Replacement in Pediatric Oncology Patients Receiving Amphotericin B

*Baxter Award*

*Janet Smith, Don Hamilton, Roxane Carr*

**Objective:** To examine the practise of potassium chloride (KCl) replacement in pediatric oncology patients receiving amphotericin B (amp-B).

**Study Design:** A retrospective chart review was conducted of patients who received amp-B on the oncology ward between August 2000 and May 2001. A survey was distributed to pediatric oncology pharmacists at other pediatric institutions to assess KCl infusion guidelines in other institutions across North America.

**Results:** Twenty hypokalemic episodes were identified within 22 patient admissions Fifty-five percent used KCl replacement at rates exceeding our institution's guidelines. Other pediatric institutions varied with respect to the maximum rates and concentration of KCl permitted on non-intensive care wards.

**Conclusions:** Based on the data from this review, the KCl administration guidelines for our hospital were changed. We now allow a maximum peripheral line concentration of 60 mmol/L, a maximum central line concentration of 120 mmol/L, and a maximum KCl infusion rate of 0.4 mmol/kg/hr without the requirement of a heart monitor. TPN is now restricted to maximum concentration of 80 mmol/L and fluid restricted patients are restricted to a maximum concentration of 150 mmol/L.

## Application of a Personal Digital Assistant in a Pharmacy-Directed Warfarin Dosing Program

*Bristol-Myers Squibb Award (formerly DuPont Pharma Award)*

*Fran Paradiso-Hardy, Ada Seto, Stephanie Ong, Claudia Bucci, Patti Madorin*

Warfarin pharmacists participating in a *Pharmacy-Directed Warfarin Dosing Program* at our institution have full prescribing authority for warfarin and are responsible for prospectively monitoring patients on a daily basis, interpreting laboratory results, adjusting warfarin doses, educating patients, and facilitating the continuity of anticoagulation care into the community. Until recently, patient workup and documentation for this program was completed using a paper-based system.

Personal Digital Assistants (PDAs) overcome many of the limitations associated with a paper-based system and can enhance the quality of patient management. PDAs provide an effective means for the electronic storage and management of patient data, and allow rapid and efficient access to up-to-date electronic medical information, management protocols, and therapeutic guidelines.

The objective of our project was to incorporate a PDA into the daily patient-related activities of a *Pharmacy-Directed Warfarin Dosing Program* for heart valve replacement patients. Using the Pendragon Forms program, a "PDA Patient Data Collection Sheet" was created to emulate the paper-based system of the Pharmacy-Directed Warfarin Dosing Program. Several comprehensive and customized lookup lists were incorporated into the PDA program to allow simplified, effective, and efficient data entry.

To date, approximately 40 patients have been successfully managed by our automated program using the PDA. Overall, the warfarin pharmacists have found the PDA to be a valuable, convenient, and user-friendly patient monitoring device. The "PDA Patient Data Collection Sheet "is an important tool to improve the continuity of anticoagulation care and decrease potential medication errors. Moreover, the creation of an electronic patient database allows the warfarin pharmacists to monitor the effectiveness and efficiency of the *Pharmacy-Directed Warfarin Dosing Program* on an ongoing basis.

## Pharmacist-Managed Lipid Clinics: Development and Implementation in the Canadian Forces

*Bristol-Myers Squibb Award*

*Lieutenant Colonel Régis Vaillancourt, L. Maria Gutschi, Janice Ma, Major Shannon Sinclair, Danette Beechinor*

**Rationale:** In previous studies performed at our facility, gaps in dyslipidemia management were noted, especially for patients at higher risk of cardiovascular disease. To improve lipid goal attainment and adherence to lipid-lowering therapy, pharmacist-managed clinics were incorporated into existing health facilities.

**Methods:** A lipid clinic protocol was developed and received formal approval in January 2000. With this protocol, pharmacists were authorized to titrate dosages of lipid-lowering drugs, to substitute drugs within a class, to order laboratory tests, to provide lifestyle counselling, and to refer patients to other health professionals for purposes of enhancing lipid control. Physician consultation was required to initiate new drugs, to switch drug classes, or to add a second lipid-lowering agent. Clinic referrals were made by physicians, pharmacists or patients themselves. The resulting lipid clinic protocol was then applied uniquely in at health care centres in Ottawa, Halifax and Victoria.

**Results:** A total of 144 patients had their lipid therapy managed by a pharmacist. Of these patients, 27 (18.8%) were lost to follow-up. Among the remaining 117 patients, only 48 (41%) met their target LDL-cholesterol goals at baseline and only 40 (34.2%) met all target lipid levels as per Canadian guidelines. Following pharmacist intervention, 94 patients (80.3%) met target LDL-cholesterol levels, and 71 patients (60.7%) met all lipid goals. The majority (74.6%) of pharmacists' recommendations were unrelated to drug therapy. All recommendations were accepted by primary care physicians.

**Conclusions:** Pharmacist-managed lipid clinics resulted in improved management of patients with dyslipidemia

## Topical Corticosteroid Prescribing Patterns Following Changes in Drug Benefit Status

*GlaxoSmithKline Award*

*Chole A. Campbell, Charmaine A. Cooke, Swarna D.S. Weerasinghe, Ingrid S. Sketris, Pam R. McLean-Veysey, Chris D. Skedgel*

**Objective:** This study examined changes in prescribing patterns for topical corticosteroid products dispensed to seniors in Nova Scotia, Canada after all but two combination topical corticosteroid products were removed from the Nova Scotia Seniors' Pharmacare Program benefit list.

**Methods:** Administrative prescription claims from the Nova Scotia Seniors' Pharmacare Program were used to identify the number and costs of topical corticosteroid, antifungal, antibiotic and combination corticosteroid products dispensed. Time-series analysis was used to compare the periods before (April 01, 1999-March 31, 2000) and after (April 01, 2000-March 31, 2001) the delisting.

**Results:** In 1999/2000, 26,031 of 103,400 eligible seniors (25%) and in 2000/2001, 22,837 of 95,550 eligible seniors (24%) received a prescription for a defined topical product. Nova Scotia Seniors' Pharmacare Program expenditures for all topical products decreased from $11.88 to $10.60 per beneficiary per year (11%) after the policy revision.

Topical combination products decreased from 18% of all topical products dispensed to 14%, while the percentage of potent corticosteroid products dispensed increased from 24% to 27% over the study period.

Pre- and post-policy time-trend analysis showed statistically significant increasing trends in cost per beneficiary for all topical products and potent corticosteroid products. Combination corticosteroid products showed no change in trends for costs per beneficiary before, and a slight increasing trend after, the policy revision.

**Conclusions:** Prescribing of topical corticosteroid combination products decreased following the formulary revision. There was an increase in potent topical corticosteroid prescribing. Future study involving evaluation of patient outcomes would be useful.

## Integration of a Pharmacist into a Multidisciplinary Geriatric Assessment Clinic: Does Better Communication of Drug-Related Problems and Related Recommendations to Community Caregivers Enhance the Care of Clinic Clients?

*GlaxoSmithKline Award*

*Lori Romonko Slack, Tak Fung, Cheryl Jeffery, Steve Long*

**Background:** Grant funding was obtained to staff a pharmacist on the team for 1 year. That pharmacist's contribution to clinic clientele was evaluated. The primary objective of the evaluation was to determine if the information obtained and drug-related recommendations made by the pharmacist were successfully communicated to and followed through in community by community caregivers and/or the client themselves. It would be determined if the receivers of the information found it identified new or previously unknown drug therapy issues. Secondary objectives were to determine if the drug regimens of clinic clients were optimized and rationalized as a result of the pharmacist's assessment.

**Methods:** Clients, family, family physicians, home care nurses and community pharmacists were surveyed at 3 weeks and again at 3 months. Number of medications, number and types of drug-related problems were identified; number of recommendations to community made and implemented and Medication Appropriateness Scores[1] for clinic clients were compared pre and post clinic visit.

**Results:** The pharmacist saw 74 patients in the evaluation period (1 year). 60 clients from the year prior to the pharmacist's involvement were randomly selected for the historic control group. Significant differences were seen between the intervention group and the control group in number of drug-related problems identified and number of drug-related recommendations made. For intervention clients, 653 interventions were made or recommended. Of those 492 (75%) were implemented at 3 weeks and 501 (77%) at 3 months. 87% of those surveyed had responded at 3 weeks and 70% responded to the 3-month survey. 80% of community health professionals agreed that the clinic pharmacist identified new issues regarding their clients drug therapy and rated the pharmacist service as a 4 or 5 on a scale of 1-5. Greater than 90% of clients and family rated the pharmacist service as a 4 or 5 out of 5 and 45% felt their health and well-being had improved after the clinic visit. A significant decrease in total weighted MAI scores post pharmacist recommendations was also seen.

1. Hanlon JT et al. A Method for Assessing Drug Therapy Appropriateness. *J Clin Epidemiol* 1992;45(10):1045-51.

## Identifying the Optimal Timing of HER2/neu Testing in Patients with Breast Cancer: A Canadian Cost Minimization Analysis

*Mayne Pharma Award*

*G. Dranitsaris, W. Hanna, B. Norris, F. O'Malley, K. Gelmon*

**Background:** The human epidermal growth factor receptor-2 (HER2) is amplified in 20-30% of breast cancers. HER2 gene amplification and overexpression occur early in the development of breast cancer. Two validated assays available for HER2 testing are immunohistochemistry (IHC) and fluorescent in situ hybridization (FISH). Current guidelines suggest that IHC is a reasonable first test with additional testing with FISH in inconclusive cases. The current policy in Canadian provinces is to screen for HER2 upon disease recurrence. However, screening all patients for HER2 at diagnosis is associated with some practical advantages and may even avoid future costs. In this study, a cost minimization analysis was conducted to identify the most economically attractive time point for measuring HER2 status.

**Methods:** A decision analysis model was developed to simulate most common economic outcomes. The model incorporated the risk of recurrence in stage I-III breast cancer, the clinical utility of IHC and FISH towards the selection of optimal anticancer therapy as well as costs for HER2 testing, tissue retrieval and adjuvant chemotherapy.

**Results:** HER-2 testing at diagnosis instead of recurrence would be associated with an incremental cost of $Can38,800 in patients with stage I disease. In contrast, a savings of $Can84,700 and $Can68,500 would occur in patients with stage II and III breast cancer if testing was performed at diagnosis. Overall, a net savings of $Can114,400 would result if the new policy were applied to all newly diagnosed patients.

**Discussion:** The current economic evaluation revealed that a policy of HER-2 testing at diagnosis would be modestly cost saving to the Canadian health care system. Furthermore, the availability of early information on HER2 status may contribute to the selection of optimal anticancer therapy.

## Switching from Abciximab to Eptifibatide for Percutaneous Coronary Interventions: A Local Analysis (SWAP Study)

*Merck Frosst Award*

*Vivian W.Y. Leung, Rubina Sunderji, Peter J. Zed, Ken Gin*

**Background:** Glycoprotein IIb/IIIa inhibitors (GPI) are recommended as adjunctive therapy with percutaneous coronary interventions (PCI). Only abciximab (AB) was available at our institution until October 2000. Thereafter, eptifibatide (EP) was added to formulary and became the preferred agent due to lower cost.

**Objectives:** To describe the impact of switching from AB to EP on prescribing patterns and clinical outcomes following PCI.

**Methods:** Charts of patients who received a GPI with PCI for various indications were reviewed retrospectively. The AB group spanned the 6 months preceding formulary addition of EP in October 2000. A matching number of consecutive patients following this date were included in the EP group.

**Results:** A total of 160 patients were included (80 per group). Adjunctive GPI usage increased from 11% to 25% of PCI within three months of adding EP to formulary ($p<0.001$). Compared to AB, EP was associated with more in-hospital ischemic complications (12.5% vs. 2.5%, $p<0.025$) and minor bleeding (p=ns). Premature GPI discontinuation was more common in the EP group (46.3% vs. 7.5%, $p<0.001$). Eptifibatide patients had a longer length of hospital stay post-PCI (mean 44.4h vs. 25.1h, $p<0.0001$).

**Conclusions:** Adjunctive GPI usage more than doubled following introduction of EP to the formulary. Eptifibatide may be associated with inferior clinical outcomes compared to AB for PCI.

**Key Words:** platelet aggregation inhibitors, angioplasty, angina, myocardial infarction

## Practical Pharmacogenetics: The Cost-Effectiveness of Screening for Thiopurine S-Methyltransferase (TPMT) Polymorphisms in Patients with Rheumatological Conditions Treated with Azathioprine (AZA)

*Novartis Award*

*Carlo A. Marra, John M. Esdaile, Aslam H. Anis*

**Background:** Thiopurine S-methyltransferase (TPMT), which catalyzes the inactivation of AZA, exhibits genetic polymorphism that results in dose-related, serious toxicities (mainly hematological cytopenias) in 10-15% of individuals treated with AZA. Polymerase chain reaction (PCR) tests provide a sensitive, specific means of prospectively identifying these patients prior to AZA therapy and minimizing toxicity through dosage reduction.

**Objective:** To model the cost-effectiveness of the two alternative AZA treatment strategies in rheumatologic conditions: 1) utilizing PCR to determine polymorphisms leading to TPMT deficiencies prior to AZA therapy with a reduction in dose; and 2) no testing. The analysis was conducted from a third party payer perspective over a 1-year time horizon.

**Methods:** A decision analytic model was applied to map the costs and outcomes of patients under both strategies. Data applied to the model included the positive and negative predictive values of the PCR, the probabilities of adverse events due to AZA and the costs associated with their management. Sources of data included published clinical trials, diagnostic test evaluations, surveillance trials and economic evaluations.

**Results:** Dose-related toxicities result in AZA discontinuation rates of 10-20%. . The usual dosing strategy cost $677 per patient whereas the genotype-directed dosing strategy cost $663 per patient. In the genotype dosing strategy, the number needed to treat to avoid one adverse event over six months was 20. Thus, the genotype-based dosing strategy dominated the usual dosing strategy. One-way sensitivity analyses revealed that the estimates were robust to ranges of ±30% for the costs, the properties of the PCR test, and the probability of adverse events.

**Conclusion:** The introduction of PCR testing to identify TPMT polymorphisms prior to AZA treatment may represent good value in certain health care settings.

## Development, Implementation, and Evaluation of a Cardiovascular Medication Education Audiovisual Program

*Novopharm Award*

*Fran Paradiso-Hardy, Angie Giotis, Patti Madorin, Nancy Moore*

**Objectives:** Develop, implement, and evaluate the patient acceptance of an innovative medication education audiovisual program that would better meet the learning needs of patients with coronary heart disease (CHD), and involve family members, hospital/community pharmacists, and other health professionals.

**Methods:** The project was divided into three phases. The voluntary assistance of four staff pharmacists with extensive clinical expertise in CHD was recruited for the development and implementation of all phases of this project. In the first phase, currently available medication information resources were identified and reviewed with respect to accuracy, content, and appropriateness. Phase two involved the development and implementation of a low-budget medication education audiovisual program. In the third phase, patients' satisfaction and perception of the medication information provided were evaluated by a pharmacy-developed survey.

**Results:** Seventeen videotapes (approximately five to ten minutes in length per videotape) of a pharmacist providing medication-related information using the visual aid of slides were developed for common cardiovascular medications and/or medication classes. Each videotape is complemented by a pharmacy-developed medication information sheet as written reinforcement of the information discussed in the videotape. To date, the videotapes were shown to increase the cardiovascular medication-related knowledge and satisfaction of patients, spouses, family members and/or caregivers.

**Conclusions:** By providing consistent and comprehensive medication information to patients with CHD during various stages of their recovery (both in-hospital and in ambulatory care settings), this cardiovascular medication education audiovisual program will potentially allow patients to achieve their goal of improving medication knowledge, compliance, and reduce medication-related problems. To date, this program has resulted in significant patient satisfaction.

## Pharmacist's Contributions, Prescribing Practices, and Workload Measurement in an Outpatient Thoracic Rehabilitation Program

*Pfizer Award*

*Charles Bayliff, Vanessa Barron, Richard Malthaner, Sanjay Mehta*

**Background:** Due to financial pressures and shortened length of hospital stays pharmacy services, particularly to ambulatory patients or patient groups, are expanding to meet patient needs.

**Methods:** The provision of pharmaceutical care to patients with severe pulmonary disease who attended an outpatient thoracic rehabilitation program and the workload measurement of the time required to provide these activities was assessed. Only actual drug related problems(DRPs) were recorded.

**Results:** Over a 15 week period the pharmacist visited the clinic and interviewed and followed 36 patients (25M, 11F) (mean age 66.7±7.1 years). Most patients had a diagnosis of emphysema. The pharmacist interacted with each patient 3.2±2.2 times and identified 75 actual DRPs (2.1±1.9 per patient) during the 15 hours spent in the clinic. Of the 75 actual DRPs identified 58(77%) were resolved. The most common DRP was patient was taking/using too much drug(16 cases), followed closely by needing drug but not administering it correctly(15 cases). Taking too little drug(11 cases), no indication(9 cases), needing medication(8 cases), wrong product(8 cases) and experiencing an adverse drug reaction(8 cases) accounted for the rest of the actual DRPs.

**Conclusions:** A pharmacist's participation in an outpatient thoracic physiotherapy program provided an opportunity to identify and resolve drug related problems in patients with severe pulmonary disease.

## Seamless Care: Evaluating the Impact of a New Discharge Prescription Form

*Pharmascience Award*

*Sarah Connelly, Deborah Yoong, Janet Martin, Kelly Zarnke, Charles Bayliff, Kim Delamere, Santosh Deshpande*

**Rationale:** An integrated discharge prescription form (IDPF) was developed to narrow the existing communication gap between acute and community pharmacy care settings in order to improve patient medication compliance following discharge from hospital.

**Objective:** An IDPF was developed to facilitate care of patients being discharged from hospital. The primary objective was to compare the number of patients with discordant medication regimens between the IDPF and usual care groups 5-10 days after discharge.

**Methods:** Patients >16 years discharged from general medicine units at the London Health Science Centre between March 1st and April 30th 2001 were eligible to participate in this non-randomized, single centre, multi-site investigation if they met all inclusion criteria.

Patients were contacted 5-10 days after discharge from hospital to determine medication use. Medication regimens were considered discordant if >1 discrepancies were found between hospital medication profile and reported patient medication use. The discordance rates were compared between patients in the IDPF and usual care groups.

**Results:** During the investigation period, 154 patients were studied. The IDPF and usual care groups were comprised of 95 and 59 patients, respectively. The two study groups were not statistically different at baseline, with respect to age, duration of hospital stay and number of medications at time of discharge. Significantly fewer patients in the IDPF group had discordant drug regimens [17 (17.9%) vs. 29 (49.2%), $p<0.001$)] when compared to patients in the usual care group.

**Conclusion:** Patient concordance with prescribed hospital medication regimens 5-10 days after discharge improved significantly with the implementation of the IDPF on a general medicine service.

## Multidisciplinary Approach to Erythropoietin Resistance in a Hemodialysis Unit

*Roche Award*

*Anne Dar Santos, Karen Shalansky, J. Jastrzebski*

**Objective:** This study assessed the impact of a multidisciplinary approach to erythropoietin (EPO) dosage requirements in EPO-resistant hemodialysis (HD) patients.

**Methods:** This was an 8-month prospective, open-label study. Nineteen patients in a 160-bed HD unit receiving EPO doses greater than 300U/kg/week were defined as EPO-resistant. Hgb, iron indices, parathyroid hormone, folate, B12, aluminum and reticulocyte counts were determined at baseline. The former three parameters were followed every 6, 12 and 26 weeks, respectively. Vascular access flow was regularly assessed via ultrasonic dilution methodology. Target Hgb was 120-135g/L. All factors potentially contributing to EPO resistance were assessed every 6 weeks by the multidisciplinary team and treated, if possible. Downward EPO dosage adjustments of 12.5-25% to the closest 1000U were considered if underlying causes of EPO resistance could not be identified or reversed, or if Hgb rose beyond the target.

**Results:** Dysfunctional vascular access and iron deficiency were the predominant treatable factors associated with EPO resistance. By study end, mean EPO dosage decreased significantly from 469U/kg/week to 319U/kg/week ($p<0.01$) and mean Hgb increased significantly from 106g/L to 116g/L ($p=0.02$). The proportion of patients in the study population with Hgb in the target range increased from 16% to 63%. Annual cost savings approximated $78,000.

**Conclusion:** A structured multidisciplinary approach to the management of EPO-resistant patients was successful in significantly lowering EPO dosage with improvement in serum Hgb at a substantial cost savings.

## A Profile on the Use of Alternative and Complementary Therapies in Children with Cancer

*Sabex Award*

*Dominique Martel, Claudine Laurier, Jean-François Bussières, Denis Lebel, Sandra Kish, Albert Moghrabi*

**Introduction:** The behaviors associated to the use of complementary and alternative medicines (CAM) are not well known by different health care professionals. The weak knowledge of their use is a barrier in taking care of the patient and his/her family.

**Objectives:** Establish the prevalence of usage of CAM among children with cancer treated at Sainte-Justine hospital, describe the profile of usage and reasons of use. The quality of life in these children is also measured.

**Methodology:** Cross-sectional descriptive study. A self-administered questionnaire permitted the collection of demographic data, information relative to the use of CAM and the quality of life. The clinical data were collected from the patient's medical record.

**Results:** Ninety two parents completed and returned the questionnaire for a level of response of 80%. The users of CAM represent 49% of the respondents and the users of natural/homeopathy/vitamins 40% of users.

**Conclusion:** Half of the children with cancer use CAM. The evidence of this reality translates itself into the presence of needs not being satisfied by conventional medicine.

**Keywords:** alternative therapies, complementary therapies, oncology, pediatrics, prevalence studies, quality of life.

## Pharmacokinetics of Oral Ciprofloxacin in Non-Infected Patients on Continuous Cycling Peritoneal Dialysis

*Schering Award*

*Sharon M. Yeung, Scott E. Walker, Sandra A.N. Tailor, Linda Awdishu, Sheldon Tobe, Teraiza Yassa*

**Rationale:** In order to avoid aminoglycosides, the International Society for Peritoneal Dialysis recommends cefazolin and ceftazidime for empiric peritonitis treatment. Ciprofloxacin covers the relevant gram-negative pathogens without the resistance issues associated with ceftazidime. However, ciprofloxacin pharmacokinetic data in patients on continuous cycling peritoneal dialysis (CCPD) is lacking.

**Objectives:** i) To determine the pharmacokinetics of oral ciprofloxacin in CCPD patients; ii) To compare serum and dialysate ciprofloxacin concentrations with minimum inhibitory concentrations (MIC) of gram-negative bacteria associated with peritonitis; and iii) To establish a guideline for oral ciprofloxacin dosing in the empiric treatment of CCPD-related peritonitis.

**Methods:** Eligible CCPD patients received two doses of ciprofloxacin 750mg orally q12h. Serial blood and end-of-dwell dialysate samples were collected during the first 12-hour interval, and a final blood sample and end-of-dwell dialysate sample was collected from the overnight dwell at the end of the second 12-hour interval. Ciprofloxacin concentrations were determined by a liquid chromatographic-fluorescence method. Pharmacokinetic calculations were completed assuming a one-compartment model.

**Results:** Eight patients completed the study. The mean pharmacokinetic parameters determined for ciprofloxacin were (mean ( SEM): serum t1/2 of 10.1 ( 1.2 hours, serum Cmax of 2.7 ( 0.5 mg/L, serum tmax of 1.6 ( 0.1 hours after the first dose and peritoneal clearance of 1.2 ( 0.1% of the mean calculated total body clearance. While all patients achieved serum AUC:MIC >125 for *Escherichia coli* and *Klebsiella* species after the first dose, only two patients achieved this goal for Pseudomonas aeruginosa. End-of-dwell dialysate concentrations were above the MIC for *E. coli*, *Klebsiella* spp., and *P. aeruginosa* after the second dose.

**Conclusion:** Ciprofloxacin 750mg orally q12h in CCPD patients may be useful in empiric management of bacterial peritonitis for gram-negative coverage and for the treatment of documented peritonitis caused by sensitive *E. coli* or *Klebsiella* species. However, traditional therapy with ceftazidime may be required for documented pseudomonal peritonitis. In addition, we observed adequate serum ciprofloxacin concentrations with this regimen to treat systemic gram-negative infections caused by sensitive *E. coli* or *Klebsiella* species.