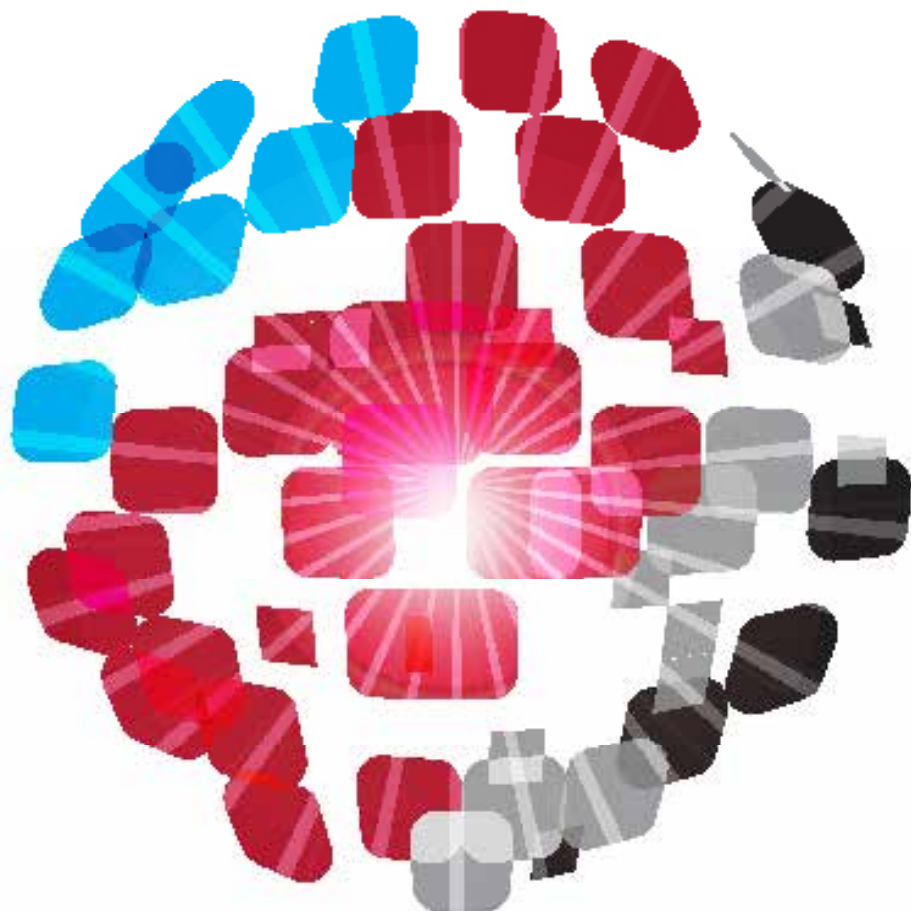


SPECIAL SUPPLEMENT TO THE
CANADIAN PHARMACISTS JOURNAL



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CONGRÈS DES
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Pharmacy Practice Research Abstracts



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This year, the Canadian Pharmacists Association (CPhA) and the Alberta Pharmacists' Association (RxA) partnered to deliver four days of exciting educational sessions, exceptional keynote speakers, social events and networking opportunities at the annual Canadian Pharmacists Conference.

The Canadian Pharmacists Conference is an excellent opportunity for pharmacists from across Canada to network with colleagues and to share new and exciting ideas, research and innovation. Our oral and poster pharmacy practice research presentations provide an opportunity for members of the pharmacy community to engage in sessions that promote evidence-based practice and decision-making.

To help promote and disseminate pharmacy practice research, CPhA publishes the abstracts of the research presented at the conference in this special supplement of the *Canadian Pharmacists Journal*.

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ECG screening in community pharmacy: An innovative pilot program to improve detection of cardiac arrhythmias in high- risk patients

John Papastergiou, BScPhm; Larissa Boychuk, BSc, PharmD candidate

- OBJECTIVES:** Undiagnosed arrhythmias such as atrial fibrillation and torsades de pointes can have serious health consequences. Atrial fibrillation causes 1/3 of strokes and 1.4% of these patients are undiagnosed. Over 150 medications are known to prolong QT intervals. The purpose of this study is to assess point-of-care ECG screening in identifying undiagnosed abnormalities in high-risk patients in a community pharmacy setting.
- METHODS:** High-risk patients were invited to participate in ECG screening at two community pharmacies in Toronto, Ontario. Patients met eligibility requirements if they were at risk of QT prolongation or atrial fibrillation secondary to medication therapy or a CHADS2 score of >2, respectively. Using the HeartCheckPen™ handheld device, a 30 second lead II screening test was performed. Data was uploaded to an ECG reading service where results were interpreted by a qualified professional. Results were forwarded to the pharmacy for follow-up. Pharmacists referred all patients with abnormal readings to their primary care physician for further investigation.
- RESULTS:** Thirty-five patients participated in the program. Eleven were identified at risk for atrial fibrillation and 18 for QT prolongation — 5 patients met both criteria. Screening identified 10 (28.6%) patients with one or more abnormal rhythms. These included premature atrial contraction (n=3), wide QRS (n=4), sinus arrhythmia (n=1), sinus tachycardia (n=3) and QT prolongation (n=1). Pharmacists referred all patients and, in the case of QT prolongation, intervened to alter therapy.
- CONCLUSIONS:** Our experience demonstrates that point-of-care ECG testing can be successfully integrated into pharmacy workflow. The results illustrate the prevalence of abnormal rhythms in high-risk patients. They highlight a significant opportunity for pharmacists to use point-of-care screening as a tool to detect abnormal rhythms, intervene when warranted, and improve medication safety.

Impact of the Community Pharmacists Assisting Total Cardiovascular Health (CPATCH) strategy for improving medication adherence from community pharmacies – A cluster-randomized trial

David Blackburn, PharmD; Charity Evans, PhD; Jeff Taylor, PhD; Kerry Mansell, PharmD; Derek Jorgenson, PharmD; Yvonne Shevchuk, PharmD; Alfred Rémillard, PharmD; Dean Eurich, PhD; Bill Semchuk, PharmD; Anne Champagne, BSP

OBJECTIVES: The highest risk for non-adherence occurs during the first year after starting a new chronic medication. Community pharmacists are well positioned to identify problems and provide support during this critical time.

METHODS: Thirty community pharmacies in Saskatchewan, Canada, were randomized to deliver a brief adherence intervention or usual care to new users of HMG-CoA reductase inhibitors (statins). The intervention consisted of screening for new statin users, assessment for adherence barriers, and individualized follow-up when appropriate. The primary endpoint was mean statin adherence measured by the proportion of days covered (PDC). During follow-up, intervention pharmacies performed monthly assessments to estimate compliance with the study protocol.

RESULTS: A total of 1,906 new statin users were followed for six to twelve months following their first statin dispensation. No significant differences between intervention and control pharmacies were observed for mean adherence (72% (SD 33) vs 71% (SD 33); $p=0.64$), median adherence (89% versus 88%; $p=0.84$), or the percentage of subjects achieving optimal adherence (i.e., $PDC \geq 80\%$: 57.3% (520/907) versus 55.8% (558/999); $p=0.51$). However, several intervention stores reported poor compliance to the study protocol. In post-hoc analyses, mean adherence among pharmacies reporting good compliance with the study protocol was substantially higher than stores with poor compliance (76% versus 66%; $p<0.01$), and the percentage of patients achieving optimal adherence was 63% vs 52% ($p<0.01$) respectively.

CONCLUSIONS: The CPATCH strategy was not effective for improving statin adherence compared to usual care in community pharmacies. However, post-hoc analyses suggested that successful implementation might be the key to achieving important benefits.

The Alberta Vascular Risk Reduction Community Pharmacy Project: RxEACH

Yazid Al-Hamarneh, BS(Pharm), PhD

OBJECTIVES: Despite the risk associated with hypertension, diabetes, dyslipidemia, and smoking, these cardiovascular disease (CVD) risk factors remain poorly identified and controlled. To evaluate the effect of a community pharmacy-based case finding and intervention program on estimated cardiovascular risk.

METHODS: *Design:* Randomized controlled trial. *Setting:* 56 community pharmacies across Alberta. *Population:* Adults at high risk for CVD events, including those with diabetes, chronic kidney disease, vascular disease and/or Framingham score > 20% who have at least one uncontrolled risk factor (hypertension, LDL-cholesterol (LDL-c), HbA1c, or current smoking). *Randomization:* Participants were randomized (1:1 basis) into advanced or usual care groups. *Advanced care:* Pharmacists provided participants with: Physical and laboratory assessments; Individualized CVD risk assessment and education; Pharmacists prescribed where appropriate to achieve treatment targets; Regular monthly follow-ups for 3 months. *Usual care:* Usual pharmacist care with no specific intervention for 3 months. *Primary outcome:* The difference in change in estimated CVD risk between advanced and usual care groups, calculated using a relevant risk calculator based on participants' co-morbidities (Framingham, International, or UKPDS).

RESULTS: We enrolled 723 patients. Median age was 62 years (interquartile range 54-69), 57% were male and 27% were smokers. After adjusting for baseline values, the difference in change in CVD risk was 21% ($p < 0.001$): a change of 0.2 mmol/L in LDL-c ($p < 0.001$), 9.4 mmHg in systolic blood pressure ($p < 0.001$), 0.92% in HbA1c ($p < 0.001$), and 20.2% in smoking cessation ($p = 0.002$) between advanced and usual care groups (96% and 91%).

CONCLUSIONS: This is the first large randomized trial of CVD risk reduction in community pharmacy settings. Patients in the advanced care group were 21% less likely to have a heart attack, stroke, or peripheral artery disease when compared to those in the usual care group. RxEACH provides evidence for the benefit of pharmacist care on both global CVD risk and individual risk factors

Implementation of a standardized HbA1c clinic worksheet to improve detection of drug therapy problems: Results from a multi-pharmacy pilot program

John Papastergiou, BScPhm; Bryan Gray, BScPharm, RPh, CDE

OBJECTIVES: Point-of-care HbA1c screening devices are a valuable tool that community pharmacists can use to monitor patients with diabetes and improve their overall management. Here, we report data from a multi-pharmacy pilot program where a standardized worksheet was used by pharmacists offering HbA1c clinics in order to standardize the structure of the patient interviews and improve detection of drug therapy problems.

METHODS: Thirteen community pharmacies from across Ontario interested in offering HbA1c screening as part of their professional programmes participated in the pilot program. Pharmacists received training on the use of the standardized worksheet and were provided with all the tools required to hold a clinic. HbA1c analysis was performed using the Roxon A1c Now[®]. Data collection took place over a period of 4 months beginning August 2015.

RESULTS: Eighty-eight patients attended the clinics. The mean HbA1c of the population was 7.76. Overall, 36% of patients had optimal glycaemic control (A1c <7.0%), 45% were hyperglycaemic (A1c >7 and <9%) and 19% of patients had marked hyperglycaemia (A1c >9.0). A total of 204 interventions were performed by pharmacists. An average of 2.32 interventions were performed per patient, and we observed a trend towards increased numbers of interventions in patients with poorer glycaemic control. Interestingly, 23% and 15% of patients met the CDA guideline requirements for therapy with a statin and an ACE/ARB, respectively, but were identified by pharmacists as not receiving the appropriate therapy.

CONCLUSIONS: These results illustrate the prevalence of suboptimal glycaemic control among patients with diabetes in the community. They highlight a significant opportunity for pharmacists to use point-of-care screening in combination with a standardized worksheet to more readily detect drug therapy problems and intervene to improve disease management when warranted.

Community pharmacist bone density point-of-care screening with osteoporosis and fracture risk estimation

Bryan Gray, BScPharm, RPh, CDE

- OBJECTIVES:** Point-of-care bone density screening is a valuable tool that community pharmacists can use to identify and educate patients at risk for osteoporosis and fractures. Here, we report data from screening 66 patients (12 male) at structured bone density clinics held at a community pharmacy in Thunder Bay, ON.
- METHODS:** Bone density analysis was performed using the Omnisense 8000. Fracture risk factors and the point of care T-scores were interpreted with both the Canadian CAROC estimator and the WHO FRAX risk estimator to provide a 10-year fracture risk assessment. Recruitment involved in-pharmacy promotion to all patients. Data collection took place over a period of 3 months.
- RESULTS:** Testing successfully identified patients potentially at risk for osteoporosis and fracture. The CAROC found 5, 7, and 54 patients at high, moderate, low risk, respectively, for developing fracture over a 10-year period. The WHO FRAX calculator found a similar distribution with ten patients receiving a major fracture risk estimate 10% or greater, and five patients with a hip fracture risk estimate 5% or greater. The average patient age was 61, and the average BMI was overweight at 29. A total of 273 recommendations were provided by the pharmacist — average 4.13 per patient.
- CONCLUSIONS:** These results illustrate the prevalence of potentially undiagnosed osteoporosis for patients in the community. Our intervention data suggests that a structured bone density consultation by a community pharmacist can identify patients at risk for fractures. Patients at low risk were given evidence based and practical recommendations to maintain their bone health and reduce the risk of developing osteoporosis. Continued expansion in scope of pharmacy practice may contribute to increased osteoporosis identification and reduction in fracture risk.

Defining characteristics of successful pharmacists

Jay Mutch, BScPharm (student); Lydia Cheung, BScPharm (student); Theresa Charrois, BScPharm, ACPR, MSc; Jill Hall, BScPharm, ACPR, PharmD; Meagen Rosenthal, PhD; Ken Cor, PhD

- OBJECTIVES:** Our primary objective was to identify the self-described characteristics of pharmacists that contribute to their success. Our working definition of success in pharmacy is based on the premise that successful pharmacists practice to the full extent of their knowledge and skills. The definition was derived from a literature review as well as the Blueprint for Pharmacy.
- METHODS:** Semi-structured individual interviews were conducted with selected pharmacists. The interview tool was developed using previous research on success in health care professions and was modified based on trial interviews with faculty and practitioners. Potential candidates were nominated by prominent pharmacists in the field, using our definition of success. Lists from the nominators were compared and 10 pharmacists who appeared on more than one list were invited to participate.
- RESULTS:** A total of 8 out of 10 interviews have been analyzed to date. All 8 pharmacists had additional prescribing authorization (APA), with 4 of those pharmacists being early adopters (receiving APA prior to remuneration model implementation). In terms of factors contributing to success, participants noted strong communication skills and developing relationships as important. When asked what success meant to them, participants believed that self-development played a large role. Participants also felt a focus on emotional intelligence would help ensure the success of pharmacist practice in the future.
- CONCLUSIONS:** A clearly delineated definition of success was developed and used to frame interviews with practitioners viewed as successful by their peers. Communication skills were the most prominent factor that contributed to success. This data will help individual pharmacists become aware of what characteristics they may want to foster in themselves in order to have success in practice.

Development and implementation of a pharmacist intervention for frail elderly patients in an interdisciplinary primary care team: A qualitative analysis

Tejal Patel, PharmD; Lindsay Donaldson, BA; Linda Lee, MD; Jillian Bauer, BScPharm; Cathy Schill, BScPharm

OBJECTIVES: There is a paucity of published literature describing activities involved in the implementation of an intervention in an interdisciplinary primary care environment. The objective of this research is to describe the development and implementation of the pharmacist intervention (PI) for frail elderly patients in an interdisciplinary primary care team.

METHODS: This study is a deductive qualitative analysis of emails and meeting minutes pertaining to the PI for frail patients. Classical content analysis was conducted to quantify previously established codes and themes pertaining to: 1. Goal of the PI (e.g. codes: literature review, objectives of PI, etc); 2. Delivery of the PI (e.g. codes: care provision, follow-up, tracking outcomes, etc); 3. Work Environment (e.g. codes: roles and responsibilities, availability of staff, workflow processes, etc) and 4. Sustainability of PI (e.g. codes: scheduling, etc).

RESULTS: Of the 2,830 email items and minutes of 4 meetings between pharmacists, physicians, nurses, receptionists and administrators that were reviewed, 172 emails and 4 meeting minutes were eligible for classical content analysis. Of the resulting 718 coded items, 40% were related to Work Environment, 36% to the Delivery of the PI, 12%, each, to the Goal and Sustainability of the PI. The number of items coded for Goal of PI decreased from a high of 50 items in the period of 6 months pre-initiation to 2 items at the end of 24 months post initiation of PI. The number of items pertaining to the codes, “tracking” and “follow-up” of patients increased from 4 and 0 at 6 months pre-initiation to 19 and 39 at 24 months post-initiation of PI, respectively.

CONCLUSIONS: The impact and importance of the different aspects, such as the goal, delivery of the program, working environment and relationships changed with time. This analysis may be used to improve planning of other interventions in primary care in the future.

Identifying drug-related problems in retirement home residents following community pharmacist administered flu vaccinations

Bryan Gray, BScPharm, RPh, CDE

OBJECTIVES: Community pharmacist administered flu vaccinations serve as an opportunity to screen patient's medication profiles for drug-related problems. Here, we report data from medication consultations of 58 patients (16 male) from three retirement homes in Thunder Bay, ON.

METHODS: Consenting retirement home residents were scheduled for a flu vaccination and a subsequent medication consultation. Following intramuscular vaccine administration, resident's medication regimens and health status were screened for potential drug-related problems. Following consultation, the community pharmacist communicated potential drug-related problems to the resident's primary care provider. Data collection took place over a period of 1 month.

RESULTS: Following vaccination, standardized medication consultations identified a total of 579 potential drug-related problems — an average of 9.98 interventions per patient. Very few of the patients were aware of their overall vaccination status (291 recommendations). Many patients were receiving inappropriate cardiovascular disease medications (over treating hypertension or lipids (76 recommendations). Consolidation of the medication regimen was very well received by residents (46 recommendations). The average patient age was 87 years old, with 9.5 medications per patient (average), with an average number of dosing intervals of 3.6 per day. Recommendations to improve adherence could reduce dosing intervals to 1.9 per day. Patients were appreciative to have their medication regimen and health status reviewed by the pharmacist instead of waiting independently for the 15 minutes post vaccination time period to pass.

CONCLUSIONS: In addition to the benefits provided by vaccination, subsequent medication consultations successfully identified potential drug-related problems. This data suggests that retirement home residents may be at risk for drug-related problems which may be mitigated by pharmacist intervention.

Deprescribing guidelines for the elderly: Overview of findings from a 3-year program of research

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- OBJECTIVES:** Class-specific deprescribing guidelines are a potential solution to address the problem of polypharmacy. Optimal approaches to developing and implementing such guidelines with practitioners have yet to be identified. The purpose of the study was to understand factors associated with successful deprescribing guideline development, implementation and uptake and whether self-efficacy for deprescribing was affected.
- METHODS:** Deprescribing guidelines were developed using AGREE-II (Appraisal of Guidelines for Research and Evaluation), and GRADE (Grading of Recommendations Assessment, Development, and Evaluation) to rate certainty of evidence and strength of recommendations. Developmental evaluation was performed using ethnographic methods: observations and interviews with guideline development and site implementation teams, and facilitated feedback sessions to discuss and agree on process improvements. Self-efficacy surveys were completed. Setting and participants included guideline development team members; members of three Family Health Teams and three Long-Term Care sites in Ottawa, Canada; and study team members.
- RESULTS:** Three evidence-based deprescribing guidelines were developed (proton pump inhibitors, benzodiazepine receptor agonists and antipsychotics). Process components and resulting decision-aid algorithms will be presented. Factors that facilitate successful development include team members' expertise in content/methods, access to additional expertise/resources through professional networks, and staff support. Development processes were modified for the 2nd and 3rd guidelines to ensure clarity in scope and responsibilities. Site implementation experience suggests practitioners are more interested in how to implement deprescribing approaches versus existing evidence to support stopping medications, that practice site priorities and processes shape ability to incorporate recommendations and that aligning guidelines with existing processes is critical to implementation success. Self-efficacy increased among 9 consistent respondents across all guidelines. Examples of how site experiences influence development of deprescribing guidelines will be provided.
- CONCLUSIONS:** Optimizing a deprescribing guideline development and implementation process aims to facilitate clinicians' ability to address polypharmacy. Developmental evaluation contributes to the improvement of processes used to develop and implement such guidelines.

Community pharmacist standardized home medication consultation program by referral: Structured approach to identifying drug-related problems in the home-bound population

Bryan Gray, BScPharm, RPh, CDE; Laura Bron, BScPharm, RPh, CDE

- OBJECTIVES:** Perform home medication consultation to identify drug-related problems and communicate concerns to the primary prescriber. Secondary objectives: Identify trends across the different intervention categories, identify drug-related problem trends by disease states and project the anticipated cost savings from avoided hospital admissions.
- METHODS:** A referring agency in Thunder Bay, ON, sent requests for Home Medication Consultations for 33 patients (11 male) over a 3 month period. Pharmacists screened the patient's medication regimen and health status for potential drug-related problems. Following consultation, the community pharmacist communicated potential drug-related problems to the resident's primary care provider.
- RESULTS:** A total of 223 interventions (average of 6.76 per patient) were provided to 23 different prescribers. Average age was 76 years. Twelve were immediately accepted, 8 were immediately declined, and the remaining 203 would be discussed at the patient's next visit. Secondary outcome: Pharmaceutical Opinion Classification Trends — The majority of recommendations were related to: requiring additional drug therapy, adherence, and sub-optimal response to current therapy. Secondary outcome: Disease State DRP Trends — Based upon disease state and medical conditions, immunization/vaccination status was the most common DRP, followed by adherence (opportunity to reduce dosing frequency, merge drugs to combination therapy, and adherence packaging), and mental health (8 DRPs related to sleep/insomnia, 14 DRPs related to depression/mood/anxiety, and 2 DRPs related to smoking). Secondary outcome: Projected Case Cost Forecasted Savings — This totals \$12,062.19 cost savings for avoided hospital admissions with 2 avoided hospital admissions.
- CONCLUSIONS:** A standardized and structured approach to performing home medication consultations successfully identified potential drug-related problems.

The Medication Assessment Centre: A novel student training and patient care program

Derek Jorgenson, BSP, PharmD, FCSHP; Eric Landry, BSP, ACPR; Katherine Lysak, BSP, MSc candidate

OBJECTIVES: The Medication Assessment Centre (MAC) was launched in 2011 by the College of Pharmacy and Nutrition (University of Saskatchewan), with the dual purposes of: (1) providing access to pharmacist-led comprehensive medication assessments for highly complex patients who cannot access the service elsewhere; and, (2) creating a novel faculty supervised experiential training program for pharmacy students, located on campus. The objective of this project was to perform an evaluation of this program from the perspective of patients and physicians.

METHODS: A retrospective chart review was performed on all patients who attended at least one MAC appointment between March 2014 and July 2015 to measure: number/description of patients; referral sources; and numbers/severity of drug therapy problems (DTPs). An experience/satisfaction survey was mailed to patients and their physicians who utilized MAC between April and October 2015.

RESULTS: A total of 173 patients were included in the chart review. Patients were referred from both health professionals (65.9%) and self-referrals (34.1%). Patient mean age was 64.8, with a mean of 6.5 diagnoses and 13.8 different chronic medications each. Pharmacists identified 6.2 DTPs per patient (31.1% moderate severity using Schneider criteria). Surveys were mailed to 121 patients and 81 physicians (response rates 66.9% and 43.2%, respectively). Almost 95% of both groups described their experience as very satisfied/satisfied and reported that they would refer MAC to their friends/family/colleagues; 59.2% of patients and 88.6% of physicians felt MAC improved patient outcomes; 98.8% of patients felt they were treated with dignity/respect and that the pharmacist listened to their concerns; and 97.5% of patients felt they were involved in decisions about their health.

CONCLUSIONS: MAC is meeting its objective of providing access to medication assessments for highly complex patients. Physician and patient experience has been very positive and highly supportive of the program.

Collaborative care model involving eHealth to improve treatment adherence and health outcomes of patients with gout

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- OBJECTIVES:** The prevalence of gout is increasing and despite availability of efficacious therapies, sub-optimal clinical outcomes persist due largely to medication non-adherence. Pharmacists may have a role in supporting patients to improve their gout management. The objective of this study is to pilot the feasibility of an interdisciplinary care model involving rheumatology, pharmacy, and dietetics using shared electronic medical records (EMRs) to provide gout care.
- METHODS:** This is a proof-of-concept study that employs a pharmacist-driven protocol whereby they are responsible for providing medication management, adherence counselling, interpretation of lab tests, and corresponding titration of urate-lowering therapies. Eligible patients are adults age ≥ 19 who have been diagnosed with gout by a rheumatologist for ≥ 1 year, ≥ 1 flare in the past year, and serum uric acid (SUA) > 360 $\mu\text{mol/L}$ within past 2 months. Remotely located health team members use shared EMRs to exchange patient information and communicate on care plans. Study outcomes include the impact of the care model on patients': SUA levels (target < 360 $\mu\text{mol/L}$); medication adherence (Compliance Questionnaire for Rheumatology 5-items); functional status (HAQ); and quality of life (EQ-5D); assessed at 0, 3, 6, and 12 months. Target enrollment is 50 patients.
- RESULTS:** Preliminary results on 21 patients enrolled from 3 rheumatology clinics since Feb. 2015 include 85% males, mean age 56 years (SD 15). All patients were prescribed allopurinol. At 6 months, adherence rate was 50%, and average SUA was 350 $\mu\text{mol/L}$ versus 445 $\mu\text{mol/L}$ at baseline. To date, pharmacy has provided 71 consultations and dietetics 12 consults. Anecdotal pharmacist interventions also included drug dose increases, discontinuation of unnecessary medications, and prescription continuations.
- CONCLUSIONS:** A virtual interdisciplinary clinic for gout management with expanded pharmacists' role appears feasible with preliminary data showing improvement in SUA.

Effectiveness of community-based pharmacist interventions in chronic non-cancer pain: A systematic review

Feng Chang, BScPhm, PharmD; Mo Chen, BSc, MSc candidate; Tejal Patel, BScPhm, PharmD

- OBJECTIVES:** Chronic pain is a common condition that has significant impact on patients' physical and psychological well-being. Pharmacists have a key role in providing patient-centred care to optimize drug therapy used in the management of chronic pain. To evaluate the effectiveness of interventions by pharmacists providing care in community settings for ambulatory patients with chronic non-cancer pain.
- METHODS:** Six electronic databases (PubMed, Cumulative Index to Nursing and Allied Health Literature, COCHRANE, PsychInfo, EMBASE and International Pharmaceutical Abstract) were searched for randomized controlled trials (RCT) and non-randomized studies (NRS) published in the English language involving pharmacists providing direct care in the management of chronic non-cancer pain. Team based approaches were included if a pharmacist was involved. Manual bibliography searches with retrieved articles were conducted. Risk of bias was assessed for all included studies.
- RESULTS:** The search strategy identified 17 full-text articles from 14 studies. Six of the studies were based on pharmacist-only interventions and the other 8 involved pharmacists working as part of an interprofessional team. The most frequently used pharmacist intervention was consultation involving medication review, recommendations, follow-up, and patient education. There was variation across pain measures and other self-reported measures in the included studies, but most studies showed positive results. Pharmacist interventions significantly decreased pain scores, improved quality of life and patient satisfaction, and reduced medication-related side effects and cost. Pain intensity reduction achieved ranged 8%-21%.
- CONCLUSIONS:** Pharmacist interventions were positive in several domains studied. However, the clinical significance remains debatable due to heterogeneity in relation to intervention, outcome measures, clinical setting, sample size, and study duration.

The consideration of sex/gender and vulnerable populations in pharmacy practice research

Nancy Waite, PharmD; Martin Cooke, PhD; Katie Cook, MA; Emily Milne, PhD; Feng Chang, PhD; Lisa McCarthy, PharmD; Beth Sproule, PharmD

OBJECTIVES: Funders often now require that sex and gender are main considerations in research programs, but provide little guidance about how this can be accomplished. The Ontario Pharmacy Research Collaboration (OPEN), a multi-institutional and multidisciplinary research program, adopted a sex/gender and vulnerable population (GVP) model within the collaboration to promote incorporation of sex, gender and other dimensions of vulnerability across OPEN's research projects. This presentation (1) addresses why the consideration of GVPs matter to pharmacy practice and (2) describes the GVP model's mandate, activities and experiences.

METHODS: This mixed method study incorporates: (1) literature search of published work on this topic; (2) critical reflection of co-leads of the GVP team with regards to the creation and implementation of the model; and (3) surveys (n=37) and interviews (n=23) conducted with OPEN members about their knowledge of GVP issues and engagement with GVP services.

RESULTS: The consideration of sex/gender and vulnerable populations within pharmacy practice research is necessary, but lacking. Within OPEN, a GVP team was established to support research projects in their incorporation of sex/gender and various dimensions of vulnerability into research design, analysis and interpretation. According to OPEN members, knowledge pertaining to GVP issues in research increased through OPEN involvement. The GVP model "surfaced" domains traditionally neglected in the field but important to ensuring quality pharmacist practice. OPEN members have been receptive and engaged with the GVP model and mandate. However, more work needs to be done in order to fully translate this awareness into research practices.

CONCLUSIONS: There is a need for increased awareness and consideration of sex/gender and vulnerable populations in pharmacy practice research. The experience of OPEN suggests that a cross-project structure can help integrate these considerations into a large and complex research project. We encourage practitioners to consider GVP focused initiatives, tools, and models within their work.

Introducing a unit-based clinical pharmacist: A pilot study

Vinita Arora, RPh, BScPhm, ACPR, MEd, PharmD; Heather Parker, RPh, BScPhm; Alexandra Hernandez, PhD; Karyn Li, BSc candidate; Mehrdad Alizadeh, RPh, PharmD

- OBJECTIVES:** A pharmacist was stationed on a forensic mental health unit to more fully participate in the interprofessional team. Since clinical pharmacy services were previously centralized, we evaluated the impact of this change on staff and patients of a forensic wing.
- METHODS:** We administered anonymous surveys at three time periods, post 1, post 2, and post 3, at 1, 5, and 12 months, respectively (72 beds; nstaff 25, 27, 28; npatients 21, 21, 18) to examine themes of accessibility, education, and medication therapy management (MTM). Non-parametric chi-square analyses were used to examine differences in overall satisfaction (Strongly Agree and Agree responses combined) scores over the time periods. We also compared percentages of satisfaction in these themes and qualitative changes over time.
- RESULTS:** The average change in staff satisfaction from post 1 to post 3 was 8% for the Accessibility theme, 9.5% for the Education theme (2 to 17%) and 11% for the MTM theme (1 to 30%), with the increase in MTM satisfaction approaching significance ($\chi^2=5.911$, $p=0.052$). The average change in patient satisfaction from post 1 to post 3 for questions in the Education theme was -12.5% (-5 to -24%) and -28% for questions in the Accessibility theme, however the decreases were not statistically significant. Qualitatively, there were positive changes stated by staff in all themes, most notably, accessibility; while patients expressed desire for increased services in all themes.
- CONCLUSIONS:** Being situated on a forensic mental health unit enhances involvement of the clinical pharmacist in the interprofessional team. Accessibility may be a precursor to provision of increased MTM and education. Limitations surrounding patient satisfaction need further consideration.

Patient-centered renovations

Joan Cochrane, BSP

- OBJECTIVES:** My object was to renovate my pharmacy to make it easy for my pharmacists to provide better patient care.
- METHODS:** We have designed our pharmacy so that the pharmacist is the first point of contact for the patient. The pharmacist is situated in a semi-private area at the front of the store. Our design has 2 of these “pharmacist interaction stations” to decrease wait time. The patient comes to the pharmacy, gives their prescription, refill or new, to the pharmacist and sits down across from the pharmacist. The pharmacist station has a computer with Internet access, a phone, a scanner and a computerized blood pressure monitoring system. This allows the pharmacist to handle the prescription in a single efficient interaction with the patient. If there are no problems to solve, the pharmacist can fill the prescription, the label prints at the island in the main dispensary area, if in the robot, it is automatically counted, if not, the technician assembles the medication and then brings it over to the pharmacist, who can hand it out. The pharmacist has been talking to the patient about the prescription and giving the appropriate information. Then the prescription is handed to the patient who is directed to the cash station. If there are problems, drug interactions, 3rd party coverage issues, etc., they can be taken care of right away.
- RESULTS:** Our staff and patients are very happy with the layout. We are doing more prescriptions every month and yet have found that we have more time than we used to. Our patients feel that when it is their turn with the pharmacist they have their undivided attention. They like that both they and the pharmacist are sitting down.
- CONCLUSIONS:** It is much easier to provide meaningful patient care if you have a pharmacy that is designed primarily with this function in mind. This new design with pharmacist stations and a work island for the techs replacing the long counter has proven to be very effective.

Medication reconciliation practices on discharge into primary care homes in Prince George, British Columbia

Robert Pammett, BSc, BSP, MSc

OBJECTIVES: Medication reconciliation is an integral part of safe medication practices, and should occur at all stages of hospital transition, including discharge to the primary care home (PCH). Ensuring that the PCH has an up to date list of patient medications after discharge can help avoid medication misadventures. The objectives of this study were: (1) to determine the proportion of patients who had a discharge medication list communicated to the primary care home which contained discrepancies from the hospital medication list, and (2) to categorize discrepancies as prescription medication, non-prescription medication, or medication dose.

METHODS: Two PCHs were recruited to participate in the retrospective chart review. Records of 50 patients who received a hospital discharge from June 1 2014 to May 31 2015 were identified at each PCH. The list of hospital medications at discharge was compared to the medication list that was communicated to the PCH at discharge. Discrepancies between these lists were identified and categorized, as was the medium in which the medication list was communicated to the PCH.

RESULTS: Seventy-eight cases were included in the final data analysis. Mean age of patients was 46.7 years, 59% being female. The mean number of medications taken was 6.3 per case. Four cases had no medication use. All discharge medication information was communicated via a dictated discharge summary. The total number of discrepancies identified was 280, a mean of 3.6 per case. The majority of discrepancies were prescription medication omissions or errors (69%). The remaining discrepancies were non-prescription medication omissions or errors (18%) and medication dose discrepancies (13%).

CONCLUSIONS: A large number of discrepancies were present between the hospital chart and the discharge summary that was sent to the PCH. Improving communication of the medication list at discharge should be encouraged to reduce potential medication errors.

Stakeholder perspectives on economic analyses of billable pharmacy services in Ontario

Sherilyn Houle, BSP, PhD; Jilan Yang, MD, MSc, PhD

- OBJECTIVES:** A number of pharmacy services in Ontario are government-funded; however, little is known about the costs and benefits of these services. This study solicited stakeholder perspectives on the most valuable economic analysis designs, the priority services, and concerns related to the conduct of the research or dissemination of results.
- METHODS:** Semi-structured telephone interviews were conducted with 16 stakeholders from government, academia, pharmacy industry/associations/regulators, and insurers in March and April 2015. Interviews were audiotaped, transcribed verbatim, and coded both manually and using NVivo. Data analysis employed the constant comparison approach to identify emerging themes and patterns.
- RESULTS:** There was consensus among stakeholders that high-quality economic evaluations of pharmacy services are needed. While evaluation of MedsCheck reviews was considered highest priority, influenza vaccination was widely identified as a suitable starting point given data availability and clear patient outcome measurement. A broad perspective including those of government/payers, the pharmacy profession, and patients is encouraged, with patient outcomes identified as more valuable than financial outcomes. However, accurate and complete patient outcome data collection was identified as a key challenge. Stakeholders reported a desire to be actively involved in economic evaluations and knowledge dissemination.
- CONCLUSIONS:** Researchers considering economic evaluations of pharmacy services are encouraged by stakeholders to incorporate broad perspectives beyond solely the interests of the profession. While patient health outcomes are valued above financial outcomes, care should be taken to ensure this outcome data is accurate and complete to minimize the impact of assumptions on the validity of the results. Stakeholder engagement at all stages of the research can help ensure the relevance and uptake of economic analyses conducted.

Opportunity and cost: Self-monitoring of blood glucose in Manitoba, 2000-2013

Olena Serwylo, BSc(Pharm), PharmD candidate; Kevin Friesen, BSc(Pharm), MSc candidate; Jamie Falk, BSc(Pharm), PharmD; Shawn Bugden, BSc(Pharm), MSc, PharmD

- OBJECTIVES:** Given the limited evidence of benefit of frequent self-monitoring of blood glucose (SMBG) by non-insulin using patients with diabetes, new guidelines and test strip limit policies have been suggested and implemented in various Canadian jurisdictions. The objective of this study was to assess the overall utilization and cost associated with blood glucose test strips (BGTS) and lancets for SMBG in Manitoba from 2000 to 2013 and to assess potential implications of such a policy.
- METHODS:** A cohort of all patients with diabetes in Manitoba from 2000-2013 was established. Test strip and lancet utilization and cost were assessed for the overall cohort and for subgroups based on the type of diabetes treatment. The potential opportunity for a more selective practice of SMBG was assessed.
- RESULTS:** In the year 2000, 8 million BGTS were dispensed in Manitoba, and this increased by 270% to 21.7 million by 2013. Insulin users accounted for the majority of test strip use. However, it was estimated that test strip use could be reduced by 16 million test strips over 5 years by taking a guideline based approach to monitoring, with 95% of the potential reduction occurring in groups not using insulin. Over the next 5 years, a guideline based approach is projected to save \$12.35 million, including \$7.3 million in government spending.
- CONCLUSIONS:** Some provinces have placed therapy-linked limits on BGTS use. Whether or not a test strip limit policy is in place there is an important opportunity for pharmacists to help guide patients with diabetes to determine optimal frequency of SMBG. Expenditures above guideline recommendations represent an opportunity cost, money which could be redirected to programs and more useful interventions for the growing population of patients with diabetes in Manitoba.

Ibuprofen provides superior antipyretic efficacy vs. acetaminophen in childhood fever: Pooled analysis of 2 randomized trials

David Kellstein, PhD; Shyamalie Jayawardena, PhD

OBJECTIVES: Compare antipyretic efficacy and safety of ibuprofen (IBU) vs acetaminophen (APAP) in children with fever from a pooled analysis of 2 studies.

METHODS: Two IRB-approved, randomized, double-blind studies enrolled children 0.5 - 11 y, 13 - 95 lb with fever (101.5 - 104.9°F, rectally, ages 0.5 - 3 y; 101.0 - 103.9°F, orally, ages 4 - 11 y) for ≥ 2 -h duration to single-dose IBU suspension (Children's Advil® Suspension 7.5 mg/kg) or APAP suspension (Children's Tylenol® Suspension 10 - 15 mg/kg) based on labelled dose/age. Temperatures (temperature; average of 2 readings) were assessed at baseline (predose) and after single dose of study medication at 15, 30 and 45 min and hourly from 1 - 8 h thereafter. Primary efficacy: time-weighted sum of temp difference from baseline over 8 h evaluated via analysis of variance. Secondary efficacy endpoints included time to onset and duration of temp control (temp: $<100^{\circ}\text{F}$ orally or $<101^{\circ}\text{F}$ rectally) via Cox proportional hazards; percentage with temperature control (Cochran-Mantel-Haenszel); safety was monitored throughout.

RESULTS: In total, 319 children (144 male, 175 female; 94% white; mean age 4.6 y; mean weight 42 lb) were evaluable for efficacy; 333 comprised the safety set. On primary efficacy, IBU 7.5 mg/kg was significantly better in terms of time-weighted sum of temperature differences vs APAP 10 - 15 mg/kg: mean (SD) -11.1 (8.5) vs -7.6 (8.0); $p < 0.001$. Onset of temperature control occurred significantly earlier (median: 94.5 vs 111.6 min; $p < 0.001$), lasted significantly longer (median: 191.3 vs 122.7 min; $p = 0.042$) and occurred in a significantly higher percentage of children (89.6 vs 66.7%; $p < 0.001$) with IBU suspension vs APAP suspension. Fifteen AEs occurred in each group; none severe. Most common AE was vomiting (4.6%: IBU; 6.3%: APAP; $p > 0.05$).

CONCLUSIONS: IBU paediatric suspension (7.5mg/kg) is superior to APAP suspension (10 - 15mg/kg) in treating paediatric fever, with better temperature reduction that was faster and of longer duration compared with APAP. Both products were well tolerated.

Development of a hormonal contraception decision support tool for pharmacists

Nese Yuksel, BScPharm, PharmD, FCSHP, NCMP; Humirah Sultani; Tasneem Siyam, BScPharm, MSc

OBJECTIVES: Hormonal contraception continues to be a popular and effective method of contraception among women. With the expanded scope of practice in Alberta, pharmacists are perfectly positioned to manage the hormonal contraceptive needs of women, including initiating and adjusting hormonal contraceptives. The objective of this project is to develop a decision support tool to help pharmacists manage hormonal contraceptives in the community.

METHODS: Development of the decision support tool involved a panel of local pharmacists with expertise in women's health. Content of the tool was informed by current contraception guidelines, published literature and research team experience. The developed prototype was then reviewed by experts in the field including a pharmacist and nurse specialized in contraception, an obstetrician-gynecologist and a family physician with interest in women's health. The modified prototype was alpha tested in a small cohort of community pharmacists (n=10) for acceptability and usability.

RESULTS: The tool includes 4 sections: (1) Patient Assessment — includes screening for indications, contraindications and risk factors, (2) Initiating Hormonal Contraceptives — includes guidance in choosing among different products, (3) Patient Education — provides an educational overview for shared decision making, and (4) Managing Ongoing Therapy — includes monitoring recommendations, approaches to dealing with side effects and adjusting therapy. An appendix with available Canadian Hormonal Contraceptives is also provided.

CONCLUSIONS: An evidence based clinical decision support tool may be a useful tool for pharmacists managing hormonal contraception in the community. Future plans are to evaluate the feasibility and applicability of the tool in the community setting.

The pharmacy services framework: Communicating the shift to clinical pharmacy services in Alberta

Theresa J. Schindel, BSP, MCE; Christine A. Hughes, BScPharm, PharmD; René Breault, BScPharm, PharmD; Deborah Hicks, MA, MLIS

- OBJECTIVES:** To gain insight into communication of the Compensation Plan for Pharmacy Services, known as the Pharmacy Services Framework (PSF), by interpreting information described in news media articles, policies, government reports, and communications about the PSF.
- METHODS:** Publicly available documents published 2012 - 2015 were obtained from websites such as the Government of Alberta, Alberta Blue Cross, the Alberta College of Pharmacists, the Alberta Pharmacists' Association, and the Blueprint for Pharmacy. Searches using the Canadian Newsstand database and Google identified additional documents. Search terms included "Pharmacy Services Framework," "Compensation Plan for Pharmacy Services," pharm*, compensat*, reimburse*, and Alberta. One research team member completed initial analysis of documents using a grounded theory approach and the entire team reviewed emerging thematic categories. During the analysis, attention was paid to how the PSF was presented to pharmacists and other audiences.
- RESULTS:** Preliminary analysis of documents written for practicing pharmacists consisting of government policies, newsletters, and other communications identified four main themes: reimbursing patient care services, legitimizing pharmacists' professionalism, shifting focus to patient care role, and collaborating with health care team members. The PSF was framed as payment for professional services and as offering external validation and legitimization for pharmacists' changing professional service roles. Further analysis of news media and communications directed to other audiences is underway.
- CONCLUSIONS:** Preliminary findings provide insight into how the PSF was communicated to pharmacists and other audiences. Researchers need to consider political and societal contexts that influence provision and reimbursement of clinical services. The results of this study will provide a foundation for future research on how clinical services reimbursed by the PSF are implemented.

Provider and patient perspectives regarding a community pharmacist-based case finding and intervention program – Alberta Vascular Risk Reduction Community Pharmacy project: RxEACH

Maoliosa Donald, BSc, MSc; Kathryn King-Shier, PhD; Ross Tsuyuki, PhD; Yazid Al Hamarneh, PhD; Charlotte Jones, MD; Braden Manns, MSc, MD; Marcello Tonelli, SM, MD; Brenda Hemmelgarn, PhD, MD

- OBJECTIVES:** To gain firsthand knowledge of pharmacists' and patients' experiences with pharmacist-based management of adults at risk for cardiovascular events.
- METHODS:** *Design:* Qualitative descriptive – one on one telephone interviews. *Setting:* Community – Alberta. *Population:* Community pharmacists and patients. *Data analysis:* Multi-step process using conventional qualitative content analysis.
- RESULTS:** We completed 35 telephone interviews – 21 pharmacists and 14 patients, where we had 14 dyads (pharmacist and patient relationship). The majority of pharmacists were female (57%) between the ages of 36-45, and worked in an urban setting (57%) with 10 or less years of practice. Pharmacists reported a variety of factors that affected their ability to manage patients' cardiovascular risk. These included features of their workplace (i.e., work autonomy, resources and physical space); their personal outlook and perspective (i.e., expanded professional role and professional development); collaborative physician/pharmacist relationship; and patient uptake. Common themes identified by patients included their trust of the pharmacist, ease of access to pharmacist services and presumed health care cost.
- CONCLUSIONS:** Understanding the provider and patient perspectives are key to maximizing the impact and sustainability of a pharmacy-based program to manage patients at high cardiovascular risk. Generally, patients were pleased with the clinical services provided by the pharmacist and pharmacists embraced the expanded clinical role.

An audit of 8 centres' use of anticoagulant therapies when discharging patients from hospital with acute venous thromboembolism

Tammy Bungard, BSP, PharmD; Bruce Ritchie, MD; Cindy Jones, BScPharm; Jennifer Bolt, BScPharm, ACPR, PharmD; William Semchuk, MSc, PharmD, FCSHP

OBJECTIVES: To report anticoagulant (AC) therapies patients receive for acute venous thromboembolism (VTE) upon hospital discharge.

METHODS: This retrospective chart review from April 2014 to March 2015 included 4 urban Edmonton hospitals, 2 urban Regina hospitals and 3 rural Alberta hospitals. Patients > 18 years of age who were discharged with a diagnosis of VTE (DVT or PE) that lacked another indication for anticoagulant therapy and had an anticipated lifespan > 3 months were included. We primarily sought to assess the anticoagulant regimen prescribed for patients at hospital discharge and with whom follow-up care was to occur. Moreover, we sought to compare differences among the urban and rural centres.

RESULTS: After screening 1,047 patients, 692 (66.1%) were included. The majority of patients discharged from hospital had a PE (Edmonton 84.4%, Regina 81.2%, rural Alberta 63.3%). Novel oral anticoagulants (NOACs) were the most common discharge therapy in rural Alberta (50.0%), followed by warfarin (+/- a parenteral AC) (30.0%). In rural Alberta follow-up most commonly occurred with the GP (66.7%). In Regina, the most common therapy at discharge was warfarin (+/- a parenteral AC) (59.0%) followed by a NOAC (23.9%), and a parenteral AC alone (16.2%). In Regina, the majority of follow-up was with the GP (52.1%) or specialist (52.1%). In Edmonton, 40.5% were discharged on warfarin (+/- a parenteral AC), 29.2% a parenteral agent alone, and 28.4% on a NOAC. Follow-up most commonly was with the general practitioner [GP] (29.9%) or VTE clinic (29.1%) in Edmonton.

CONCLUSIONS: The majority discharged after VTE-related hospitalizations have PEs, and NOACs are used more commonly in rural Alberta (50%) compared to urban centres (~25%). Depending on the centre, follow-up is either done via the family doctor or through specialists / VTE clinic.

An audit of 8 centres' use of anticoagulant therapies when discharging patients from the emergency department

Tammy Bungard, BSP, PharmD; Bruce Ritchie, MD; Cindy Jones, BScPharm; Jennifer Bolt, BScPharm, ACPR, PharmD; William Semchuk, MSc, PharmD, FCSHP

OBJECTIVES: To report anticoagulant (AC) therapies patients receive for acute venous thromboembolism (VTE) upon discharge from the emergency department (ED).

METHODS: This retrospective chart review included patients discharged from the ED with a diagnosis of VTE (DVT or PE) between April 2014 and March 2015. Two urban Edmonton hospitals having VTE clinics (Edm-VTE), 2 without VTE clinics (Edm), 2 urban Regina hospitals and 3 rural Alberta hospitals were included. We primarily sought to assess the AC regimen at ED discharge to the community and with whom follow-up care was to occur. Moreover, we compared differences among the urban and rural centres.

RESULTS: After screening 1,734 patients, 418 (24.1%) were included. The majority were discharged with DVT as compared to PE/PE plus DVT (Edm-VTE 54.5%, Edm 59.0%, Regina 91.7%, rural Alberta 80.0%). For Edm-VTE, discharge therapy with a parenteral AC alone (60.1%) or novel oral anticoagulant (NOAC) (20.0%) with follow up in the VTE clinic (80.6%) was most common. The majority for Edm were prescribed a parenteral AC (41.0%) or NOAC (40.3%) with either general practitioner [GP] (28.1%) or VTE clinic (33.8%) follow-up. In Regina, the majority (75.0%) were discharged on a parenteral AC with warfarin, with 11.9% each on a parenteral AC or NOAC, with GP follow-up (56.0%). Rural Alberta sites most commonly used NOACs (43.3%) or a parenteral AC with warfarin (26.7%), with GP follow up (53.3%).

CONCLUSIONS: Urban Alberta sites discharge more patients with PE (43.4%) from ED compared with Regina or rural Alberta sites. Traditional therapy with a parenteral AC (+/- warfarin) is still most commonly used at discharge, with anywhere from 12-43% receiving a NOAC across the sites assessed. NOAC use was most common (~40%) in rural Alberta and at the Edmonton site not having a VTE clinic. Variation in practice is evident.

Enhancing depression outcomes with better use of antidepressants: Evaluation of a pharmacy benefit manager-sponsored depression disease state management program

Katherine Giannoulis, BScPharm, CGP; Leanne McFarlane, BScPharm; Heather Creighton, BScPharm; Moira Reiley, BScPharm, CGP

- OBJECTIVES:** Non-adherence to antidepressants is associated with poor health outcomes and is common in people with depression. Studies using medication possession ratio (MPR) or proportion of days covered (PDC) to calculate adherence found 34-56% of patients were adherent to therapy. Persistence to antidepressants at 1, 3 and 6 months is estimated to be 70-75%, 56-60% and 40-43% respectively. To improve adherence and patient depression outcomes MHCSI developed and funded a two-year pharmacist Depression Disease State Management (DSM) pilot program for plan members.
- METHODS:** Pharmacists within MHCSI's Preferred Provider Network were encouraged to have multiple consultations with each patient in-program over a one-two year period. Pharmacists received equal compensation for each consultation. Adherence was calculated at program completion based on drug claims data using the PDC method. Patients were considered adherent if the PDC was >80%. Persistence was calculated for patients new to antidepressant therapy. Pharmacists completed a Patient Outcome Survey for each patient.
- RESULTS:** There were 59 patients in the Depression DSM program. Patients had an average of three consults. The percentage of patients considered adherent to antidepressant therapy was 70%. The average proportion of days covered for participants was 81%. Persistence to 1, 3 and 6 months was 100%, 89% and 61%. Patient Outcome Surveys were completed for 57 of the 59 patients with 81% of respondents reporting that the patient had a better understanding of condition/treatment, 65% of the patients reported "feeling better" and 54% reported productivity gains.
- CONCLUSIONS:** This suggests a pharmacist longitudinal follow-up model may improve adherence to antidepressant medication with the goal of improving patient health outcomes.

Pharmacist intervention for a frail elderly population in primary care

Tejal Patel, PharmD; Jillian Bauer, BScPharm; Linda Lee, MD; Cathy Schill, BScPharm

OBJECTIVES: In 2013, the Centre for Family Medicine Family Health Team initiated a new program called the “Case-Finding for Complex Chronic Conditions in seniors 75+ (C5-75)” to systematically screen for frailty among all persons aged 75 years and older to address medical conditions appropriately and to avert crises. As a component of this program, a pharmacist intervention was developed to address medication-related problems (MRPs). The objectives of this study are to describe the medication use in the population referred and activities performed by pharmacists in this program.

METHODS: This was a retrospective medical records review of frail elderly patients seen by pharmacists in the C5-75 program from April 2013 to August 2015. Data pertaining to patient demographics, medical conditions, and medication history as well as activities performed and recommendations made by pharmacists were abstracted.

RESULTS: Of 142 patients (54 males and 88 females, mean age 85 years [range: 75-98]) identified as frail, 54 patients accepted the offer of a medication review with a pharmacist in the C5-75 program. At initial visit with the pharmacist, the means for number of total medications was 11.60 (range: 5-23), for prescribed medications, 7.67 (range: 3-20), and for over-the-counter medications, 3.93 (0-15). Polypharmacy and high-risk medication use was highly prevalent (83% and 93%, respectively). A total of 218 MRPs were identified among the 41 patients with at least one follow-up visit with the pharmacist. Pharmacists made a total of 222 recommendations. Of the 138 that were measurable, physicians had accepted 70% and 50% were implemented at most recent follow-up.

CONCLUSIONS: Polypharmacy, high-risk medication use and MRPs are highly prevalent in the frail elderly in primary care. Pharmacists were able to address these problems with recommendations, many of which were accepted and implemented.

Impact of pharmacist assessment on classes of high-risk medications in a geriatric outpatient clinic

Sharon Ong, BPharm, PharmD; Alexandra Marin, MD, CCFP, Dip. COR; Imran Hassan, MSc; Ross Tsuyuki, BSc(Pharm), PharmD, MSc, FCSHP, FACC; Cheryl Sadowski, BSc(Pharm), PharmD, FCSHP

- OBJECTIVES:** Seniors often take multiple medications because of a high burden of chronic diseases. This complex population is vulnerable to medication-related problems. Pharmacists can improve suboptimal prescribing in older adults, however, the evidence base for this is weak. Our objective was to determine if pharmacist assessment is effective in reducing classes of high-risk medications in seniors at a geriatric clinic.
- METHODS:** We reviewed the medical charts of 245 patients aged 65 and over who were referred to our outpatient geriatric clinic and assessed using comprehensive geriatric assessment (CGA). The CGA team consisted of a geriatrician, medical trainee (student, resident or fellow), pharmacist (available part-time), and nurse. Since the pharmacist was only in the clinic on certain days, we conducted a non-randomized comparison of medication use in those seen by a pharmacist versus those who were not. Number of medications was compared using t-test and exact McNemar's test was performed to assess medication changes.
- RESULTS:** The mean number of medications of patients assessed by pharmacist (n=99) vs not assessed by pharmacist (n=89) was 10.5 (SD 5.5) vs 9.4 (SD 4.7) with a mean difference of 1.07 (95% CI, -0.41 to 2.55), p=0.157. The proportions of patients taking acetylcholinesterase inhibitor in both pharmacist and non-pharmacist groups increased, respectively, from 20% to 37%, p<0.001 and 14% to 28%, p=0.001. Other classes of medication with statistical significant changes were exclusively in the pharmacist group, such as selective serotonin reuptake inhibitor from 20% to 27%, p=0.007; over-the-counter analgesic e.g. acetaminophen from 30% to 41%, p=0.002; non-steroidal anti-inflammatory drug from 22% to 16%, p=0.013; and antihistamine or other anticholinergic (not for overactive bladder) from 7% to 2%, p=0.016.
- CONCLUSIONS:** Pharmacist assessment as part of an interprofessional geriatric clinic team led to an improvement in medication use.

Description of medication management problems and supports used in community-dwelling seniors

Sharon Ong, BPharm, PharmD; Alexandra Marin, MD, CCFP, Dip. COR; Imran Hassan, MSc; Ross Tsuyuki, BSc(Pharm), PharmD, MSc, FCSHP, FACC; Cheryl Sadowski, BSc(Pharm), PharmD, FCSHP

- OBJECTIVE(S):** Seniors commonly have problems managing their medications due to extensive medication use, medication regimen complexity, and functional or cognitive limitations. With an aging population, it is important to identify these problems so that resources can be directed to meet their health care needs. The purpose of our study was to describe the medication management problems of seniors living in the community.
- METHOD(S):** A retrospective chart review of patients aged 65 years and over who were referred to our geriatric clinic and assessed using comprehensive geriatric assessment (CGA). The CGA team consisted of a geriatrician, medical trainee (student, resident or fellow), pharmacist and nurse. Data were analyzed descriptively and McNemar's test was used for changes in calendar packaging.
- RESULT(S):** The mean age was 80.6 (SD 7.2) years, 41% lived alone and 46% lived with spouse/partner. On admission, the mean number of medications (n=236) per patient was 9.8 (SD 4.8), and 46% had medications administered via a non-oral route. Medication-related problems were non-adherence (43%), difficulty managing medication (40%) and dependence with medication use (49%). The dependent patients obtained assistance from spouse or partner (37%), family member/living separately (25%), family member/living with (18%), formal home care cueing/administration (11%) or monitoring (8%), and caregiver (9%). Calendar packaging from 55% to 70%, $p < 0.001$, and community care services from 27% to 42%, following assessment.
- CONCLUSION(S):** About half the seniors seen at the geriatric outpatient clinic had complex medication regimens, were non-adherent, had difficulty managing medications and were dependent with medication use. There appeared to be a high dependency on their spouse and family members in medication management. As such, assessing seniors for medication management and inquiring about supports for medication assistance are important roles for pharmacists in a geriatric practice.

Effectiveness of the peer-to-peer mentoring model for transitioning from classroom to professional practice

Thomas Huang, PharmD (student); Annie Lee, MSc(T), ACPR; Certina Ho, RPh, BScPhm, MSt, MEd; Edric Paw Cho Sing, PharmD; Michael Vinh, PharmD

OBJECTIVES: To better prepare pharmacy students for practice by implementing a peer-to-peer mentoring model of student-led pharmacotherapy sessions (SLPS) in the PharmD program. The learning impact and the utility of the model for student preparedness for Advanced Pharmacy Practice Experiences and the licensing exam were examined.

METHODS: Fourth-year students delivered SLPS on Cardiology, Infectious Diseases, and Patient Self-Care online and live to both third- and fourth-year students. Retrospective self-assessment surveys were administered after each SLPS. Five knowledge domains (etiology, clinical presentation, pharmacotherapy, monitoring/follow-up, and overall knowledge) were assessed. A paired t-test was utilized to evaluate the survey data. Thematic analysis was applied to the qualitative comments on the survey.

RESULTS: Eighty-one students (59% third-years; 41% fourth-years) responded to the survey. Prior to the SLPS, 46.8% of students rated their knowledge "Average" (3 of 5), while 33.1% rated their knowledge "Above Average" (4 of 5) in all knowledge domains. After the SLPS, 53.6% of students rated their knowledge to be "Above Average" (4 of 5), while 27.5% rated their knowledge "Excellent" (5 of 5) in all knowledge domains. Statistically significant increase ($p < 0.001$) was shown in all five knowledge domains post-SLPS for both third- and fourth-year students. Students stated that cases, drug charts and therapeutic overview were the most useful. Suggestions for improvement included increased interactions, counselling points, and providing practice examples.

CONCLUSIONS: The peer-to-peer mentoring model was an effective model for student learning. Students perceived a therapeutic knowledge increase after attending the SLPS. Student presenters developed public speaking skills and built confidence while consolidating knowledge. This model has proven to be effective in developing skills and knowledge for students transitioning into professional practice.

Community pharmacy reports of potential QTc-prolonging drug interactions involving fluoroquinolones or macrolides: A multi-incident analysis

Roshan Tahavori, RPh, BScPhm, PharmD; Certina Ho, RPh, BScPhm, MSt, MEd

- OBJECTIVES:** Significantly prolonged QTc may lead to torsades de pointes (TdP) in at-risk patients. Fluoroquinolones (FQs) and macrolides have the potential to prolong the QTc, and given their widespread use, are implicated in relatively high number of significant QTc-prolongation events. The purpose of this project was to analyze incidents of potential QTc-prolonging drug interactions involving FQs and macrolides, in order to fill in patient-safety gaps.
- METHODS:** We searched the Community Pharmacy Incident Reporting program for QTc-related incidents involving FQs and macrolides between April 2010 and January 2015. Using a qualitative, multi-incident analysis approach, we analyzed 56 incidents, identified themes, potential contributing factors, and provided recommendations.
- RESULTS:** Most incidents were pharmacy-intercepted drug interactions (i.e., near misses) involving moxifloxacin, ciprofloxacin, clarithromycin, and azithromycin. Commonly reported classes of interacting drugs were antidepressants, antiarrhythmics, and antipsychotics. The following themes and possible contributing factors were captured: 1) Prescriber-triggered potential for QTc-prolongation due to absence of drug-interaction assessment, 2) Potentially inappropriate pharmacist-intervention due to absence of patient risk-assessment, and 3) Patient-potentiated risk for harm due to polydoctoring and polypharmacy practices while failing to disclose complete medication lists to the providers.
- CONCLUSIONS:** Prescribers should seek patients' complete medication list and medical history, and make TdP risk-assessment when prescribing drugs with QTc-liability. Pharmacists should assess patients' risk factors for QTc-prolongation before intervening on drug-interactions. We developed a QTc-Prolongation Risk Factors Checklist to facilitate these assessments. Patients should regularly be provided with a comprehensive medication list and educated on safe medication use by pharmacists.

Medication incidents involving insulin: A multi-incident analysis

Carolyn Kasprzak, RPh, PharmD; Certina Ho, RPh, BScPhm, MSt, MEd

- OBJECTIVES:** Insulin is a life-saving pharmacological therapy for many diabetic patients. However, insulin has been identified as a high alert medication as it has the potential to cause detrimental patient harm when used in error; particularly, an excessive dose can lead to life-threatening hypoglycemia. The objective of this multi-incident analysis was to examine insulin-related medication incidents and determine potential system-based improvements that may be customized in pharmacy practice to enhance medication safety.
- METHODS:** Reports of medication incidents involving insulin were extracted from a national incident reporting database between January and December 2014. After a review of 226 incidents, 81 were included in this qualitative, multi-incident analysis. The incidents were then analyzed and categorized into main themes and subthemes.
- RESULTS:** The four main themes identified were: (1) product selection (related to unique insulin properties), with prescribing, order entry and dispensing as subthemes; (2) therapeutic regimen change; (3) dosage calculations; and (4) storage requirements. Potential solutions for prevention of insulin-related incidents included the use of standardized pre-printed order forms, integrating warning flags into pharmacy software, incorporation of independent double checks throughout the entire pharmacy workflow, and conducting comprehensive diabetes-focused medication reviews with patients.
- CONCLUSIONS:** Medication incidents involving insulin in pharmacy practice are common and have the potential to cause serious patient harm. Findings from this analysis are intended to educate health care professionals on the vulnerabilities in the medication-use process that may contribute to insulin-specific medication incidents and offer recommendations to prevent such events from recurring.

Potentially inappropriate medication use in older adults: A multi-incident analysis

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- OBJECTIVES:** Potentially inappropriate medication use in older adults can lead to preventable adverse events, which may account for a significant portion of emergency room visits and hospitalization. This multi-incident analysis identifies points of intervention in the community setting in order to prevent medication incidents that may compromise patient safety.
- METHODS:** A qualitative, multi-incident analysis was conducted on medication incidents reported to the Community Pharmacy Incident Reporting (CPhIR) program. Reports of medication incidents involving drug therapy problems, contraindications, and duplications in patients over 65 years of age were extracted between 2010 and 2015. In total, 184 incidents met the inclusion criteria of this multi-incident analysis.
- RESULTS:** Two main themes were identified: (1) patient-specific factors and (2) drug interactions. Patient specific factors include incidents where the medication was not best suited for the patient due to their intolerances or allergies, medical conditions, and inappropriate dosing/prescribing for older adults over 65 years old. Medication incidents involving drug interactions include antibiotic and chronic medication interactions, interactions between different therapeutic classes, and drug duplications of the same therapeutic class. Comprehensive medication reviews (such as MedsChecks in Ontario) help to ensure patients are safely and appropriately using medication therapies and reduce potential adverse drug events when transitioning between points of care.
- CONCLUSIONS:** Although the use of multiple medications may be appropriate in older adults, the complexity of these medication regimens increases the risk of errors and adverse effects. Implementing system-based strategies in the pharmacy workflow can help pharmacists improve patient safety and mitigate the risks of potentially inappropriate medication use in older adults.

Patient counseling: An overarching method to mitigate medication errors and ensure continuity of care

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- OBJECTIVES:** To explore the methods and behavioural tools in which community pharmacists utilize patient counselling to prevent medication incidents. The findings of this qualitative, multi-incident analysis will substantiate the strongholds in which pharmacists mitigate errors and the role of patient education in encouraging health literacy and continuity of care.
- METHODS:** A multi-incident analysis was performed on medication incidents reported to the Community Pharmacy Incident Reporting Program (CPhIR) developed by the Institute for Safe Medication Practices Canada. The keywords in the incident description included patient-counselling terminology, such as “identified,” “counsel,” “explain,” and “teach.” The incidents included in this analysis spanned from September 2014 to August 2015. They were then stratified thematically based on their modes of identification.
- RESULTS:** Of the 115 incidents that met the inclusion criteria, two emergent themes were identified: pharmacist-led and patient-led identification of medication incidents. The themes gave rise to further subthemes respectively, focussing on prescription reconciliation, therapy evaluation and clarification, storage education, patient identifier verification, and product demonstration. Reinforcement of safe medication use at the stage of patient counselling can also gear pharmacists towards patient-focused care and effective medication therapy management.
- CONCLUSIONS:** Community pharmacy practitioners can effectively identify near misses and medication incidents at the stage of patient counselling. Having a dialogue with patients at the point of care will not solely be helpful for the mitigation of errors, but also serve as a quality assurance of continuity of care.

Older people's attitudes towards deprescribing: A community study in Quebec

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OBJECTIVES: Polypharmacy is very common among older individuals and has been associated with adverse outcomes. Reducing the number of medications (deprescribing) might be a valuable option to reduce the risks. However, little is known about older individuals' attitudes towards deprescribing.

METHODS: We ran a pilot study to evaluate the feasibility of using a self-administered questionnaire among community-dwelling older individuals to address their perceptions towards deprescribing. We used a French version of the Australian Patient's Attitudes Towards Deprescribing Questionnaire. The questionnaires were distributed in ten community pharmacies and two community centers in the province of Quebec. The participants (n=129) completed the questionnaire containing 10 Likert type questions about polypharmacy/deprescribing and 5 multiple-choice questions. We used descriptive statistics to summarize the participants' characteristics. We performed chi-square tests to compare the proportions of agreement, and evaluated correlations with Spearman's Rho ($\alpha=0.05$).

RESULTS: The participants were mostly women (63%) with a median age of 76 years (IQR:71-80). The median number of daily medication was 6 (IQR: 3-8). Half of the participants considered they were taking a lot of medications, but 80% judged these medications were necessary and felt comfortable with the number they were taking. More than 80% would agree to take more medications for their health condition if required. Nonetheless, 50% of the participants mentioned they would like to reduce the number of medications they were taking. If their doctor said it would be possible, 71% would be willing to reduce the number of medications used. Those who thought they were taking a lot of medications were more willing to have their number reduced ($p<0.001$).

CONCLUSIONS: The results show that older individuals in the community are eager to undertake deprescribing, conditional on their doctor's approval.

The effect of health media reporting on self-medication use

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- OBJECTIVES:** The news media serves the crucial role of conveying complex scientific findings and health issues to the general public. The main objectives of this study are (1) to describe the public's perception of health-related content in the news media and their dependence on the media in decision-making surrounding self-medication use, and (2) to examine potential factors, both individual and media-related, that influence self-medication behaviour.
- METHODS:** Twenty-Nine adult volunteers participated in five focus group interviews that were conducted at the College of Pharmacy, University of Manitoba in Winnipeg. Each 90 minute interview was moderated by a study coordinator, audio-recorded, and transcribed. Two study team members independently analyzed the transcripts.
- RESULTS:** The general public expressed varying degrees of uncertainty towards the reliability of health reporting in news media. Most felt overwhelmed and frustrated by the excess sources of information, and the often mixed and transient messages in health news reports. A trusting relationship with a pharmacist or physician was identified as the most important factor in self-medication decision, but not all individuals had access to health care providers, due to a variety of reasons. Other influences on over-the-counter product use include education background, previous experience, upbringing, credentials of the sources, and the individual's social circle.
- CONCLUSIONS:** Decision-making surrounding the use of over-the-counter products is a complex process, often implicitly influenced by health news reporting in the media. Trusting interaction with health care providers, especially pharmacists is an important component in choosing non-prescription product use, but one that is not always readily accessible. Pharmacists are yet to maximize the opportunity in filling this health care gap.

Documentation of functional medication management in older adults within an acute care hospital

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- OBJECTIVES:** To describe the documentation of functional medication management (FMM) in adults, age 65 years and older, on medicine wards, during their hospital stay. The secondary objective was to describe the characteristics of the health care providers (HCP) documenting on FMM.
- METHODS:** This study was a retrospective chart review of a random selection of 140 patients admitted at the University of Alberta Hospital from January 2013 to October 2014. FMM was defined as the process of taking medications (including ordering, picking up, organizing, preparing, monitoring, and administering medications). This ability requires assessing factors such as physical function (including vision, dexterity, and swallowing ability) related to medications and cognitive function.
- RESULTS:** A total of 140 patient charts were reviewed. The average age was 78.9 (SD 8.4) years, 68 (48%) male, and mean 8 (SD 3.1) scheduled oral medications taken. Commonly documented components of FMM included administration of medications (52%), organizing of medication (33%), assessments of physical function including vision (25%), swallowing ability of medications (18%), and cognitive function (21%). Documentation of these activities was most frequently done by physicians (39%), occupational therapists (34%), and pharmacists (17%).
- CONCLUSIONS:** Clinicians occasionally document FMM. Given the complexity of medication regimens and the functional demands of handling these, there is a need to incorporate these assessments when evaluating patients.

Global citizenship framework — Application to pharmacy student experience

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- OBJECTIVES:** The role of pharmacists as citizens is important in terms of community engagement, public health, and advocacy. Student exposure to global citizenship is important in order to develop a view of citizenship in their future role as pharmacists. The purpose of our research was to apply a framework for global citizenship to student experiences in an international course taught in Italy.
- METHODS:** This was an exploratory qualitative study. Students at the University of Alberta enrolled in Pharm 453 (Intercultural Exploration of Pharmacy & Health) between 2011 and 2013 were invited to participate after completing the course. Students who consented individually participated in a semi-structured interview regarding their experience. We applied a published framework and the data was transcribed and analyzed by content analysis methods.
- RESULTS:** The framework included 4 main components, with examples of application in practice. The components were politics/ideology, social/collective, self/subjectivity, and praxis/engagement. Examples of each component include: (1) politics — awareness of food insecurity, injustices; (2) social — appreciation of interconnectedness, inclusion of those with different values; (3) self — being aware of one's own perspectives, concern for social justice; (4) praxis — ethical action and active participation in society.
- CONCLUSIONS:** Applying a framework in describing student experiences with global citizenship through an international course was valuable, and demonstrated that students can be engaged with important citizenship issues.

How does pharmacist prescribing fit with family physicians' practice in Alberta? Developing a knowledge translation strategy

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- OBJECTIVES:** Alberta family physicians are seeing patients with an increasing number of chronic diseases and complex medication regimens. Pharmacists are medication experts with prescribing authority who can help both physicians and patients to manage medications. However, literature and anecdotes suggest physicians have low level of understanding and speculative beliefs about pharmacist prescribing. Our objective is to develop a knowledge translation strategy to address family physicians' gap in understanding of pharmacist prescribing.
- METHODS:** Qualitative interviews were used to explore Alberta family physicians' understanding and experience with pharmacist prescribing. We used purposeful sampling method with semi structured face to face or telephone interviews. We planned to interview 12 to 15 Alberta family physicians having experience of pharmacist prescribing in their practice as well as pharmacists who are working with these physicians. Gaps in physicians' understanding were identified and will be used to develop infographics to communicate pharmacists' roles in prescribing medications
- RESULTS:** To date we have interviewed 11 physicians and one pharmacist. Often, family physicians first learned of pharmacist prescribing after receiving notification that a patient received this service or from the pharmacists they work with on teams. Preliminary themes include interprofessional hierarchy, assorted acceptability, building trust, and shared goals. Gaps include knowledge about pharmacist expertise and pharmacist prescribing authority, and communication strategies to foster collaboration. We will create infographics as educational tools, addressing the gaps. We will develop a usability testing survey to test its usability and will refine the educational tools using feedback. We will disseminate our infographics to both physicians and pharmacists through Alberta PCN leads, professional associations, and encourage pharmacists to use it with individual physicians.
- CONCLUSIONS:** We confirmed that some Alberta family physicians have limited understanding of pharmacist prescribing, resulting in lack of trust. Future research should evaluate the effectiveness of this knowledge translation strategy in the Alberta context.

Medication incidents involving smoking cessation therapies

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OBJECTIVES: Ontario pharmacists have been granted the authority to prescribe medications for smoking cessation in their expanded scope of practice. To help pharmacists minimize errors when prescribing for smoking cessation, medication incidents involving varenicline and bupropion must be examined. The objective of this project was to identify areas of vulnerability when prescribing and dispensing smoking cessation therapies.

METHODS: A qualitative, multi-incident analysis was conducted using anonymous incident reports submitted to the Institute for Safe Medication Practices Canada Community Pharmacy Incident Reporting Program. Medication incidents involving varenicline and bupropion were included in the analysis.

RESULTS: A total of 360 incidents were analyzed. Our findings were divided into two main themes according to the medication therapies: (1) varenicline and (2) bupropion. The main themes were then further divided into subthemes, comprising prescription instructions, quantity of tablets, and drug formulation. Safety interventions include separation of instructions for starter pack and continuation packs, implementation of preprinted order forms and independent double checks in the pharmacy workflow, and verification of the medication with patients during patient counselling.

CONCLUSIONS: As more patients access smoking cessation therapies, there are more opportunities for pharmacist-patient interactions. With pharmacists' expanded scope of practice, there is also a new potential for near misses and incidents involving prescribing errors in the pharmacy. Through shared learning of existing smoking cessation medication incidents from this project, pharmacists will be more prepared and aware of safe medication use when executing their expanded scopes.

Medication incidents involving immunosuppressive agents

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OBJECTIVES: Immunosuppressants are potent, immune-modulating medications that can cause significant harm to patients if used incorrectly. The objective of this multi-incident analysis is to assess the challenges of managing immunosuppressive therapy in the community setting and identifying system-based vulnerabilities.

METHODS: Oral immunosuppressive agents of interest, such as azathioprine and cyclosporine, were retrieved from the American Hospital Formulary Service classification system. Intravenous agents were excluded due to a lack of presence in the community setting. Relevant medication incidents were gathered from ISMP Canada's Community Pharmacy Incident Reporting (CPhIR) Program between January 2010 and May 2015. From an initial collection of 61 cases, a total of 47 medication incidents met inclusion criteria and were analyzed and reviewed by two analysts independently.

RESULTS: Quantitative analysis found that of the initial 61 medication incidents, 59% (36) were near-misses, 18% (11) resulted in no harm, and 3% (2) resulted in mild harm to the patient. The remaining 20% (12) were excluded due to insufficient narrative information provided by the reporter. Qualitative analysis uncovered three major themes that ran prevalent throughout all 47 incidents: (1) indication, (2) effectiveness, and (3) safety. Indication referred to incidents where an incorrect drug was being prescribed or dispensed due to look-alike/sound-alike names and/or formulation oversight. Effectiveness primarily focused on medication errors arising from sub-therapeutic dosing that resulted in therapy failure, while safety referred to incidents that resulted in toxicity due to either supra-therapeutic dosing or drug interactions. System-based vulnerabilities included factors such as confirmation bias, practitioner's knowledge gap, and lack of independent double checks in pharmacy workflow.

CONCLUSIONS: Immunosuppressive agents are commonly used by all patient populations within the community. Analysis of medication incidents provides an opportunity for health care practitioners to learn from errors and advance safe medication practices for quality patient care.

Medication incidents that could have been prevented at the prescribing stage

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- OBJECTIVES:** As the initial step in the medication-use process, prescribing errors can lead to a cascade effect that ultimately places the patient at risk for harm. The goal of this multi-incident analysis was to identify and prevent the occurrence of these systematic errors to mitigate patient harm.
- METHODS:** Data were gathered from the Community Pharmacy Incident Reporting (CPIR) Program between January 2010 and April 2015. Search criteria excluded incidents that did not occur during the “Prescribing” stage and/or resulted in “No Error.” A total of 111 incidents met the initial search criteria with 50 incidents being excluded due to insufficient narrative descriptions. The remaining 61 incidents were then analyzed.
- RESULTS:** Of the 61 medication incidents analyzed, quantitative analysis showed that 84% (51) resulted in mild harm and 16% (10) resulted in moderate harm. No incidents resulted in patient death. Qualitatively, two main themes were extrapolated from these incidents: (1) Therapeutic Plan Error and (2) Therapeutic Plan Execution Error. Therapeutic Plan Error consisted of incidents that occurred due to incorrect dose, medication discrepancy, drug allergies or drug-drug interactions. Underlying contributing factors included a lack of reliable Computerized Decision Support Systems to help capture potential drug therapy problems, and limited communication networks between health care professionals within the patient’s circle of care. Therapeutic Plan Execution Error included incidents that occurred due to incomplete prescriptions, illegible writing, or wrong patients. Potential contributing factors included a lack of system-based or forcing functions to support prescribers when prescribing and documenting medication therapies.
- CONCLUSIONS:** The prescribing stage represents a key step in the patient’s encounter with the medication-use process. Both physicians and pharmacists can improve patient safety by developing system-based strategies to prevent medication incidents at this crucial stage of patient care.

Direct oral anticoagulant medication incidents

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- OBJECTIVES:** Direct oral anticoagulation utilizing apixaban, dabigatran and rivaroxaban has become highly prevalent due to their ease of use and convenient monitoring parameters. Though their unique pharmacologic properties make them a popular choice among health care professionals, increasing use has also led to an increase in medication incidents involving these medications. This multi-incident analysis serves to explore themes that contribute to incidents involving direct oral anticoagulation medications in the community setting.
- METHODS:** Incidents were extracted from the Community Pharmacy Incident Reporting (CPhIR) Program between January 2010 and April 2015. A total of 145 incidents met the initial search criteria with 36 being excluded due to insufficient narrative descriptions. The remaining 109 incidents were then analyzed.
- RESULTS:** Qualitative, multi-incident analysis found a total of five major themes underlying all medication incidents involving direct oral anticoagulants. These included look-alike/sound-alike medications, drug-drug interactions, transition of care, intricacies of anticoagulant dosing/frequency, and pharmacy operation. Although the primary focus of the analysis was on medication incidents in the community, transition of care presented a unique challenge as it referred to medication incidents that occurred when patients were transitioning from a different health care setting into the community setting. Numerous contributing factors such as confirmation bias, a lack of reliable Computerized Decision Support Systems, and knowledge deficit of health care practitioners all played a role in facilitating these medication incidents.
- CONCLUSIONS:** The expanding role of direct oral anticoagulants in conventional chronic drug therapy requires increased vigilance from health care professionals. In the community setting, long-term use of direct oral anticoagulants can place the patient at risk of harm if not managed and monitored appropriately. By developing safe medication practices, pharmacists can help educate patients and prevent anticoagulant medication incidents.

Drug allergy incidents in community pharmacies

Leo Kim, RPh, PharmD; Jim Kong, BSc, PharmD; Certina Ho, RPh, BScPhm, MSt, MEd

- OBJECTIVES:** Drug-induced allergic reactions are frequent, unpredictable events of medication usage in the community setting. The lack of homogeneity in their presentation and severity can range from mild, localized discomfort to systemic, life-threatening anaphylaxis, which presents a challenge for community pharmacists to manage. The objective of this multi-incident analysis was to identify common themes underlying drug allergy medication incidents, involving patients with documented allergies, and offer recommendations to help prevent future incidents in the community setting.
- METHODS:** Incidents were extracted from the Community Pharmacy Incident Reporting (CPhIR) Program utilizing the inclusion criteria of “Drug Therapy Problem Documented allergy” for the type of medication incident, and generalized signs and symptoms of anaphylaxis as key words in the narrative description. A total of 273 medication incidents were captured and reviewed in this multi-incident analysis.
- RESULTS:** The three major themes identified were: (1) missing documentation, (2) computer detection incapacity, and (3) alert bypass. Missing documentation involved medication incidents that stemmed from both prescriber and pharmacy-related databases, while computer detection incapacity and alert bypass incidents only involved pharmacy-related dispensing systems. Recommendations primarily focused on the proper usage/maintenance of computer databases and communication strategies with patients. System-based strategies such as various enhancements to existing pharmacy databases, along with other continuous quality improvement programs, provide further solutions to prevent patient harm.
- CONCLUSIONS:** Drug-induced allergies can be easily screened and documented given the right tools and appropriate resources. Although unpredictable in nature, the presence of an existing drug allergy should prompt health care professionals to be mindful and cautious when prescribing and/or dispensing medications.

Medication incidents associated with hospital discharge

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OBJECTIVES: Hospital discharge is a form of transitional patient care that involves multi-step processes with multiple health care professionals at different levels of care. Due to its innate complexity, this process places patients at high risk for medication errors and potential subsequent hospital readmissions. This project examines common themes that are prevalent in medication incidents associated with hospital discharge, and provides insight into system-based recommendations for advancing safe medication practices.

METHODS: Incidents were extracted from ISMP Canada's Community Pharmacy Incident Reporting (CPhIR) Program between April 2010 and December 2014. A total of 83 incidents met the inclusion criteria. These incidents were analyzed and reviewed by two analysts independently.

RESULTS: A qualitative, multi-incident analysis revealed three main themes underlying these medication incidents: (1) error on the discharge prescription, (2) communication issues, and (3) community integration. Error on the discharge prescription involved preparation errors in the hospital such as inappropriate medications being ordered, inadvertent omission of medications, dosing errors, and wrong patient name on discharge prescriptions. Communication issues referred to miscommunication incidents between the hospital and community that involved illegible writing/print on faxed and written discharge prescriptions, as well as complex medication orders. Finally, community integration explored the lack of continuity between hospital and community care that facilitated medication errors. This included issues such as duplication in medication therapy, different preparations used in the hospital compared to community, and interruptions/additions to multi-medication compliance aids. Medication reconciliation is an effective strategy that can empower community pharmacists to mitigate patient harm and enhance transitional care during hospital discharge.

CONCLUSIONS: Patients discharged from hospitals will continue to experience harm from medication incidents if system-based vulnerabilities are not addressed properly. The results of this multi-incident analysis, along with further investigations, will help develop or improve seamless and comprehensive transitional care practices.

Successful pharmacists: A qualitative study to understand pharmacists' definitions of successful pharmacy practices

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- OBJECTIVES:** Efforts to improve uptake of advanced pharmacy practice services by various pharmacy professional organizations have included the development of definitions of pharmacists' role in patient care, meant to transmit what is a successful pharmacy practice. However, there is little evidence of how these messages are reaching practicing pharmacists. The objective of this study is to understand success in pharmacy practice from the perspective of pharmacy practitioners in various settings.
- METHODS:** In-depth semi-structured interviews were undertaken. Pharmacist participants were identified through reviews of national professional organization awardee lists and contact with state professional organizations in Mississippi, USA. The interview guide was developed from a scoping review by the authors. Interviews continued until saturation had been achieved. Qualitative content analysis was completed on all transcribed interviews.
- RESULTS:** A total of 14 interviews were conducted. There was an even split between participants practicing in community and hospital/ambulatory care settings. Two major themes emerged in the analysis. First, success was the development of meaningful relationships with patients, which led to the perceived improved uptake by patients of pharmacists' recommendations. Second, success was achieving job satisfaction. Job satisfaction was often described as knowing they were making a difference in lives of patients. Participants also identified factors contributing to success, which included communication skills, self-confidence, and a supportive work environment.
- CONCLUSIONS:** The number, or kind, of advanced pharmacy services being provided to patients was not part of the definition of practice success offered. This implies a gap between the objectives of pharmacy professional organizations and practicing pharmacists. This study provides insight into the definition of success by practitioners, and direction for how professional organizations can improve communications with practitioners.

Canadian Pharmacists Journal (CPJ) is published bimonthly for the Canadian Pharmacists Association, by SAGE Publications.

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