

SPECIAL SUPPLEMENT TO THE
CANADIAN PHARMACISTS JOURNAL



CANADIAN
PHARMACISTS
CONFERENCE

CONGRÈS DES
PHARMACIENS
DU CANADA

2018

Pharmacy Practice Research Abstracts

Canadian Pharmacists Conference 2018
Fredericton, NB



CANADIAN
PHARMACISTS
ASSOCIATION

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Pharmacists' Association
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TABLE OF CONTENTS

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.

This year's conference research program was built on past successes and explored emerging trends that could enable delegates to apply best practices from dozens of top pharmacy practice research leaders across Canada.

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*.

- S1 A multi-incident analysis on medication incidents associated with patient harm
- S2 A pilot study to determine the feasibility of using registered pharmacy technicians to identify and correct inhaler misuse
- S3 Qualitative assessment of the Saskatchewan Medication Assessment Program in patients with renal failure or renal replacement
- S4 A qualitative evaluation of the Newfoundland and Labrador Antibiotic Adherence Program
- S5 An assessment of safety culture in Prince Edward Island community pharmacies
- S6 An emerging challenge: Pharmacists' ability to counsel a growing immigrant population
- S7 An evaluation of Alberta pharmacists' beliefs, attitudes and knowledge surrounding prescription drug abuse and addiction within their practice setting
- S8 Assessing the perception and implementation of continuous quality improvement in pharmacy professionals: A pre-Safety IQ initiative
- S9 Benefits, risks and impact of medications on quality of life of a multimorbid patient: A Delphi study
- S10 Capturing medication safety culture in Saskatchewan community pharmacies using the Medication Safety Cultural Indicator Matrix
- S11 Cardiovascular assessment and medication management by pharmacists at the UBC site (CAMMPUS)
- S12 Characterizing opioid use at an academic family health team
- S13 Cost-effectiveness of pharmacist care for hypertension in Japan
- S14 Cost-effectiveness of pharmacist care for managing patients at high risk for cardiovascular disease in Canada
- S15 Determining key quality assurance indicators for Advanced Pharmacy Practice Experiences placement site visits

- S16 Economic analysis of introducing a remunerated community pharmacist consultation service on influenza vaccination for Ontario seniors
- S17 Establishing HIV point-of-care testing (POCT) programs in Canadian community pharmacies: A new “APPROACH” to HIV testing.
- S18 Evaluating community pharmacists’ implicit and explicit bias toward black and Arab individuals
- S19 Evaluation and perspectives from community pharmacists of the Medication Management Certificate Program at the University of British Columbia’s Pharmacists Clinic
- S20 Impact of a pharmacist-administered deprescribing intervention on nursing home residents: A randomized controlled trial
- S21 Impact of collaboration between primary care pharmacists and a neurologist in the management of headache patients: A retrospective chart review
- S22 Mandatory quality-related events reporting in Canada: A province-wide review over 7 years
- S23 Outcomes of diabetes management by pharmacists: The RxING practice tool
- S24 Participant feedback about cardiovascular assessment and medication management by pharmacists at the UBC site (CAMMPUS)
- S25 Patient experiences and perceptions of a novel pharmacist-led primary care clinic model
- S26 Pharmacist prescribing and care improves cardiovascular risk, but what do patients think? A sub-study of the RxEACH study
- S27 Polypharmacie chez les aînés québécois atteints d’insuffisance cardiaque : Étude populationnelle entre 2000 et 2015
- S28 Program evaluation: An essential component to complement continuous quality improvement in pharmacy practice
- S29 Shades of gray in vaccination decisions: Understanding Ontario community pharmacists’ perspectives of and experiences with seasonal influenza vaccine hesitancy
- S30 Small area variation analysis of drugs prescribed to older people: Identifying practice quality issues
- S31 The availability of pharmacists with Additional Prescribing Authorization in Alberta in relation to vulnerable populations’ distribution: A cross-sectional study
- S32 The use of potentially inappropriate medications in older adults in Quebec: A population-based study
- S33 ToolQit: An evidence-based communication and decision-guiding tool to evaluate the complexities of QT prolongation
- S34 Will I lose my license for that? A closer look at Canadian disciplinary hearings and what it means for pharmacists’ practice to full scope

A multi-incident analysis on medication incidents associated with patient harm

Adrian Boucher, BSc, PharmD; Certina Ho, RPh, BScPhm, MSt, MEd, PhD; Sonya Dhanjal, BSc, PharmD (candidate)

OBJECTIVES: Medication incidents associated with patient harm can either result in sub-optimal disease management or expose patients to unnecessary life-threatening situations, calling for attention to such incidents and the need to adopt strategies to improve overall patient and medication safety. The objective of this multi-incident analysis was to gain a deeper understanding of the possible contributing factors to incidents associated with patient harm and to develop potential recommendations to prevent error recurrences.

METHODS: A total of 971 medication incidents associated with patient harm were extracted from a national incident reporting database from 2009 to 2017, with the subsequent performance of a qualitative and thematic analysis on 909 incidents that met the inclusion criteria.

RESULTS: Three main themes were identified from the multi-incident analysis, which included (1) high-risk processes in pharmacy practice; (2) communication gaps; and (3) preventable adverse drug reactions. Subthemes were further developed for each theme, which included (A) methadone maintenance therapy; (B) multi-medication compliance aids; and (C) compounding; (A) patient-provider engagement and (B) interprofessional collaboration; and lastly, (A) drug-drug interactions and (B) documented drug allergies.

CONCLUSIONS: Independent double checks can be considered as a gate-keeping strategy for high-risk processes that are involved in the medication-use system. Clear communication within the circle of care is crucial for safe and effective patient-centered care. Technology can serve as clinical decision support for health care practitioners in mitigating preventable adverse drug reactions. It is hoped that findings from this analysis and potential solutions presented can aid with the adoption of error reduction strategies and safe medication practices. Sharing lessons learned from medication incidents will contribute to overall patient and medication safety.

A pilot study to determine the feasibility of using registered pharmacy technicians to identify and correct inhaler misuse

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OBJECTIVES: Poor inhaler technique is a pervasive problem among patients with chronic respiratory conditions that has been associated with poor respiratory outcomes. This pilot assessed the feasibility of utilizing registered pharmacy technicians (PT) in community pharmacies to assess and correct inhaler technique at inhaler refill pick-ups.

METHODS: Assessment and correction of demonstrated inhaler technique was conducted by PTs in three community pharmacies during a 30-day period. All eligible patients who visited the pharmacy for refill pick-ups were asked if they were willing to have their inhaler technique assessed. For each patient interaction, the following data was collected: estimated patient age and sex, type of issue detected (if any), perceived patient response and length of interaction. Semi-structured interviews were conducted with the PTs and pharmacy managers at the end of the 30-day period to assess perceptions and feasibility of expanding the service. NVIVO software was used to code the data into emerging themes.

RESULTS: Of a possible 231 patients eligible, 47 were offered an independent inhaler technique review by the PT. Eighty-five percent (40/47) of these patients accepted and demonstrated their inhaler technique. More than half of patients (52.5%) demonstrated at least one technical error; all of which the PTs were able to correct. Almost all patients (39/40) were perceived to be either satisfied or very satisfied with the assessment. The median time to review and correct technique was 3 minutes. Five primary themes emerged from the follow-up interviews, including: feasibility, patient benefit, potential to reduce pharmacist workload, professional development/job satisfaction and barriers.

CONCLUSIONS: By examining the use of a PT to identify corrigible inhaler misuse in community pharmacies, this study identified barriers and potential solutions for expansion of the service. Future studies should investigate the benefit of the PT expanded role on clinical outcomes in asthma and COPD.

Qualitative assessment of the Saskatchewan Medication Assessment Program in patients with renal failure or renal replacement

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OBJECTIVES: A qualitative analysis was undertaken to examine the perceptions of health care providers involved in the SMAP (Saskatchewan Medication Assessment Program) process in complex patient groups (i.e., renal).

METHODS: All nephrologists, renal pharmacists and community pharmacies in Saskatoon and Regina were sent an invitation to participate in the study. A semi-structured interview was completed with interested participants and the interviews were audio-recorded and transcribed verbatim. Coding was performed using NVIVO qualitative software to identify common themes.

RESULTS: Ten renal pharmacists, eight nephrologists and nine community pharmacists were interviewed. Community pharmacists had mixed levels of comfort providing SMAPs for renal patients, but expressed the desire to provide the best care possible. Some themes were consistent among all participant groups including “the importance of collaboration/communication,” “challenges” and “suggestions for improvement.” Specific themes such as “unique needs of renal patients” and “duplication of service” were common amongst both renal pharmacists and nephrologists. The nephrologists had very little knowledge of the program and the role of the community pharmacist, indicating the need for improved education and communication.

CONCLUSIONS: Despite some negative experiences, none of the participants believed the program should be eliminated. Several recommendations, however, are suggested to improve the SMAP process in renal patients.

A qualitative evaluation of the Newfoundland and Labrador Antibiotic Adherence Program

Tiffany Lee, BSc(Pharm), PharmD; Beverly FitzPatrick, PhD

OBJECTIVES: To explore the effectiveness of the Antibiotic Adherence Program (AAP), from viewpoints of pharmacists, pharmacy managers and/or owners, student pharmacists and patients.

METHODS: We conducted interviews with participants to explore the effectiveness, challenges and enablers of the AAP. We used purposive and theoretical sampling, transcribed interviews and conducted member checking to increase validity. Using framework analysis and the constant comparative method, structural and pattern coding were conducted by two researchers to determine categories and themes. Consensus was achieved through discussion. We obtained aggregate level data for 15 months from the Newfoundland and Labrador Center for Health Information on claims submitted for the program.

RESULTS: Thirty interviews were conducted with pharmacists (n=13), managers and/or owners (n=12) who were also pharmacists and students (n=5) from across NL. Four patients were recruited; however, for various reasons none participated. Four themes emerged: (i) The AAP provides increased opportunity for pharmacists to be active care providers, through improved initial counselling on antibiotics and follow-up on adherence, effectiveness and tolerability; (ii) despite the challenge of reaching patients for follow-up, enablers to the program (e.g., personnel support) enhance the overall feasibility; (iii) financial reimbursement is a contributing factor to the program being implemented; (iv) by itself, the AAP cannot decrease antibiotic overuse, a multidisciplinary approach is needed. Aggregate claims data demonstrated widespread uptake of the AAP across NL, with 187/189 community pharmacies submitting claims: 82,749 claims for the initial consultation fee and 50,601 for the follow-up fee.

CONCLUSIONS: There has been widespread uptake of the AAP, which is likely a function of remuneration and feasibility of the service. Generally, the participants felt positive about the program and hope it continues, citing benefits to patients and the business. The program appears valuable in educating patients about antibiotic adherence and strengthening the therapeutic relationship between pharmacists and patients.

An assessment of safety culture in Prince Edward Island community pharmacies

Jessica Chung, BHSc, PharmD; Certina Ho, RPh, BScPhm, MIST, MEd, PhD; Puja Modi, BSc, PharmD; Adrian Boucher, BSc, PharmD

OBJECTIVES: As the scope of pharmacy practice is expanding, there is a growing interest to measure pharmacy professionals' attitudes on issues that pertain to patient safety as they impact patient outcome and health care costs. The objective of this study was to explore the current perceptions and attitudes of patient safety culture in Prince Edward Island (PEI) community pharmacies.

METHODS: We administered a 39-item online questionnaire, which was adapted from a validated Safety Attitude Questionnaire (SAQ), to all 213 registered pharmacists and pharmacy technicians in PEI. We conducted descriptive statistics and qualitative thematic analysis, accordingly, on the responses collected.

RESULTS: We collected 18 responses (14 from pharmacists and four from pharmacy technicians) with an overall response rate of 8.45%. Pharmacy professionals had a fairly positive perception of safety culture in general and they indicated a strong sense of teamwork and job satisfaction. However, there is a concern with the level of staffing and inadequate job training for new pharmacy personnel at the workplace. With respect to the advancement of safety culture, perception of management was considered to be the greatest challenge.

CONCLUSIONS: The variation in responses regarding the perception of management being a potential barrier to improving safety culture implies that there is a lack of a standardized continuous quality improvement (CQI) strategy in place. The current landscape is a reminder that there is room for improvement in human resources, staffing requirements, as well as training programs for new staff in PEI community pharmacies. Resolution of these barriers would ultimately contribute to better delivery of safe and quality patient care.

An emerging challenge: Pharmacists' ability to counsel a growing immigrant population

Annie Jalal, HBSc, PharmD (candidate); Elise Paradis, PhD

OBJECTIVES: Counselling is a critical component for the safe and effective use of medications. However, with increasing immigration, cultural barriers might be limiting pharmacists' ability to provide counselling to new international migrants. This study had two research questions: 1) What cultural factors influence interactions between pharmacists and immigrants during counselling sessions in community pharmacies? and 2) What are potential solutions and best practices that can be gleaned from past studies?

METHODS: A scoping review was conducted, which consists of 5 stages: (1) identifying research questions, (2) identifying relevant studies, (3) identifying criteria for study selection, (4) charting the data and (5) collating the results. Relevant studies were identified by searching Embase, IPA, Medline, Pubmed, Scopus and grey literature. Keywords included: pharmac*, counsel, immigra*, culture, language. Inclusion criteria: the article had to (1) be published in English; (2) be about pharmacy counselling to international migrants as patients in need of clinical advice; (3) conducted in a community pharmacy setting; and (4) be empirical (i.e., based on original data, thus excluding opinion pieces). The quality of selected studies was also assessed.

RESULTS: Only seven studies of mixed quality were found, which identified four important cultural factors: preconceived beliefs about drugs and health care, language barriers, use of informal interpreters and nonverbal communication. Several solutions for reducing medication errors and increasing patient safety were also identified. One example of a solution is to work towards achieving a certain level of understanding about ethnic minority patients. This involves increasing cultural sensitivity among pharmacists and learning about immigrant patients' culture and illness perception. Another solution is to provide information sessions for immigrant patients to help dispel any myths about medications.

CONCLUSIONS: The literature is sparse, but confirms that assessment and redress of cultural disparities is important to improve medication use and the quality of encounters with patients of all cultural backgrounds.

An evaluation of Alberta pharmacists' beliefs, attitudes and knowledge surrounding prescription drug abuse and addiction within their practice setting

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OBJECTIVES: Explore pharmacists' practices, views and confidence regarding prescription drug abuse and addiction (PDAA) and identify any barriers that may prevent pharmacists from discussing PDAA with their patients and their patients' primary care providers.

METHODS: A 26-question online survey was distributed to 4261 licensed pharmacists across Alberta. Of this initial sample, 656 (15%) pharmacists participated. The survey consisted of a combination of 17 multiple-choice, 6 multipart and 3 free-response questions. Survey responses were collected on March 22, 2016 and analyzed in Qualtrics.

RESULTS: Sixty-six percent (n=408) of pharmacists indicated that PDAA was either moderately, fairly or very prevalent in their practice setting, with 55% (n=340) of respondents encountering more than 6 patients with suspected or known PDAA a month. Thirty-five percent (n=198) of pharmacists indicated they were moderately confident at identifying patients with potential PDAA. However, 41% (n=235) of the pharmacists indicated that they only discuss PDAA with identified patients less than half of the time. Pharmacists lacked confidence in their ability to discuss PDAA treatment options with their patients as well as collaborate with addiction treatment facilities. Considering barriers which may hinder pharmacist intervention, lack of training or knowledge in PDAA was identified throughout the survey and was considered a moderate to very significant impact for 76% (n=421) of respondents.

CONCLUSIONS: Although many pharmacists are moderately confident in identifying patients with potential PDAA, several barriers hinder intervention. Providing pharmacists with additional training and resources may better equip them to manage PDAA within their practice settings.

Assessing the perception and implementation of continuous quality improvement in pharmacy professionals: A pre-Safety IQ initiative

Adrian Boucher, BSc, PharmD; Certina Ho, RPh, BScPhm, MSt, MEd, PhD; Jill Hardy, BSc(Pharm), MSc; Rachel Carlson, BA; Ronda Eros, BSc(Pharm)

OBJECTIVES: Safety IQ is a standardized continuous quality improvement (CQI) program in Manitoba designed to prevent medication incidents from happening in pharmacies. The objective of this project was to explore the current perceptions, benefits, barriers and experience of CQI programs in pharmacy professionals prior to the launch of the province-wide Safety IQ initiative.

METHODS: We administered a 28-item online questionnaire over a two-week period to all registered pharmacy professionals in Manitoba. We conducted descriptive statistics and qualitative thematic analysis, accordingly, on the responses collected.

RESULTS: We collected 125 responses, with 32% pharmacy managers, 56.80% staff pharmacists and 11.20% pharmacy technicians. Pharmacy professionals had a fairly positive perception of CQI program and its associated benefits to patient care and safety. They viewed the CQI program as a platform for communication and shared learning with the ultimate goal of preventing medication incidents. There were concerns regarding CQI program implementation, such as the potential requirement for additional financial and human resources, as well as fear of reporting and discussing incidents. Time was considered to be the greatest challenge in CQI program implementation. Pharmacy professionals preferred a simple, efficient CQI program and perceived that support from management would be required for its sustainability. They shared a wide range of experiences with current CQI programs in their practice.

CONCLUSIONS: Implementation of CQI programs vary widely in Manitoba and most seem to be generally informal and internally focused. Despite concerns in increased resource requirements, pharmacy professionals appeared to be open and supportive of a standardized CQI program. They expect such a program will provide benefits including a more positive work environment, increased public trust and a reduction in medication errors. This project provides support for the implementation of Safety IQ as a standardized CQI program to improve patient/medication safety.

Benefits, risks and impact of medications on quality of life of a multimorbid patient: A Delphi study

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OBJECTIVES: To establish a consensus on the degree of benefits, risks and positive impact that medications used in the context of multimorbidity in older patients may have on quality of life.

METHODS: A panel of 16 experts (11 pharmacists) responded to the three rounds of a Delphi survey. They were asked to rate the benefits, risks and positive impact on quality of life of 50 drugs that could be used in an older patient (65-75 years old) with three chronic conditions: diabetes, heart failure and chronic obstructive pulmonary disease. The participants rated each drug according to its benefits, risks and positive impact on quality of life using a 5-level Likert scale (very high to very low). Consensus was reached if at least 70% of participants rated the items in two adjacent categories (e.g., very high/high, high/neutral).

RESULTS: Consensus was reached on 95% of items (142/150). No consensus was reached, among others, on the benefits of statins, aspirin and NSAIDs and on the risks of thiazide and potassium-sparing diuretics. Only two drugs were associated with both the highest category of benefits and positive impact on quality of life and the lowest risk category: long-acting anticholinergic and long-acting beta-2-agonists. Nine other drugs were categorized within the highest benefits level (metformin, DPP-4, short-acting beta-2-agonists, ACE-inhibitors, beta-blockers, warfarin, NOACs, nitrates and acetaminophene), while only ACE-inhibitors were also categorized within the highest category of positive impact on quality of life. Fifteen drugs were included in the highest level of risks, including warfarin and NOACs.

CONCLUSIONS: Pharmacists can play an important role in managing polypharmacy for multimorbid older individuals. They should be aware that many drugs are associated with significant risks and do not provide positive impact on quality of life. The importance of individualizing treatment according to patients' preferences is therefore of utmost importance.

Capturing medication safety culture in Saskatchewan community pharmacies using the Medication Safety Cultural Indicator Matrix

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- OBJECTIVES:** Standardized continuous quality improvement (CQI) programs are employed to assist pharmacies in recognizing medication incidents and developing solutions to prevent them. It is important to understand where practice culture surrounding medication safety stands to better support this endeavour. The objectives of this study were to explore the medication safety culture in Saskatchewan community pharmacies and identify whether pharmacies currently held a “blame-and-shame” (i.e., pathological) or “systems-oriented” (i.e., generative) attitude towards safety.
- METHODS:** The Medication Safety Culture Indicator Matrix (MedSCIM) tool, developed by the Institute for Safe Medication Practices Canada (ISMP Canada), was used to analyze two sets of medication incidents reported by community pharmacies in Saskatchewan from September 2013 to October 2017: one set was associated with patient harm, while another set contained randomly selected incidents from the top three types of medication incidents.
- RESULTS:** We analyzed 140 harm incidents: 42.8% of the reports were fully complete, 51.4% semi-complete and 5.7% not complete. Of the 158 randomly selected top three types of incidents, 5.69% were fully complete, 70.25% were semi-complete and 24.05% were not complete. Within the harm incidents, 13.5% implied a “blame-and-shame” culture, 40% reflected “reactive,” 30% indicated “calculative” and 16.5% supported a “generative” safety culture. On the other hand, “blame-and-shame,” “reactive,” “calculative” and “generative” safety culture were represented by 9.49%, 85.44%, 3.79% and 1.26%, respectively, of the randomly selected top three types of incidents.
- CONCLUSIONS:** Our MedSCIM analysis reveals that there is still work to be done to facilitate medication safety culture towards a more “systems-oriented” or “generative” attitude and it appears that community pharmacy professionals tend to do so more often if patient harm is involved in the incident. Our study offers a baseline of medication safety culture in Saskatchewan community pharmacies as the provincial mandatory standardized CQI program is being rolled out in 2018.

Cardiovascular assessment and medication management by pharmacists at the UBC site (CAMMPUS)

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OBJECTIVES: To assess the impact of a pharmacist-led service on cardiovascular (CV) health in University of British Columbia (UBC) employees.

METHODS: A prospective observational before-and-after design. Primary plan members in the UBC extended health plan with a Framingham Risk Score (FRS) $\geq 10\%$ or 1+ medication-modifiable CV risk factor were included. Anyone age < 18 years or unable to commit the required time for service was excluded. Participants received a baseline assessment, individualized consultation (comprehensive medication management, goal-setting and follow-up) for 12 months and a final assessment, all provided by pharmacists at the UBC Pharmacists Clinic. Each participant was their own control. The primary endpoint was reduction in FRS. Secondary endpoints were changes in relevant health parameters, claim costs and drug-related problem type and count.

RESULTS: Baseline assessment of 512 subjects between Sept 2015 and Oct 2016 yielded 207 (40%) study participants. Of these, 178 (86%) completed the 12-month intervention (14% lost to follow-up). Participants were 54% female, 55% Caucasian and average age 51 years of age. FRS at baseline was < 10 in 45.8%, 10-19.99 in 37.9% and ≥ 20 in 16.4% of participants. Over 12 months, participants experienced statistically significant reductions in average FRS (1 point), systolic (5.5 mmHg) (< 0.0001) and diastolic (2.1mmHg) blood pressure ($p=0.0007$). Average reductions in weight (1kg) and waist circumference (1.8cm) per person also occurred. Drug therapy problems (DTPs) were identified in 10% of participants and 56% were "Needs Additional Drug". Average service cost/participant to the UBC benefit plan was \$138 (SD \$44.71). On aggregate, improvement in quality of life (EQ5D) was small but statistically significant at 0.031 (95% CI 0.001, 0.062, $p=0.023$). Of 50 participants who were taking medication, adherence scores (MMAS-8 questionnaire) improved by 0.42 over the follow-up period ($p=0.019$).

CONCLUSIONS: UBC employees had improvements in health markers, quality of life and medication adherence after receiving a 12-month pharmacist-led intervention.

Characterizing opioid use at an academic family health team

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- OBJECTIVE:** The escalating use of opioids and related mortality is highly publicized in the media. Clinical practice guidelines have sought to provide direction on the judicious use of opioids. The objective of this study was to characterize chronic opioid use and its concordance with recommendations of the Canadian and Centers for Disease Control and Prevention guidelines for prescribing opioids for chronic non-cancer pain.
- METHODS:** Electronic medical records for adult patients with non-cancer pain prescribed chronic opioid therapy (i.e., > 3 months) between January 1, 2015 and November 30, 2016 were retrospectively reviewed. Descriptive statistics assessed concordance to guideline recommendations.
- RESULTS:** One hundred sixty adult patients (<1% of total population) received chronic opioids for non-cancer pain. Fifty-three percent of patients were female; mean age 61 years (range: 27-94). The most common pain diagnoses were back pain (45%), osteoarthritis (33%) and chronic pain (24%). Risk factors for opioid overdose or misuse were found in 82% of cases. The following rates of concordance with guideline recommendations were found: 1) total daily doses <90 mg morphine equivalents (73%); 2) presence of drug contract (42%); 3) follow-up at least four times per year (33%); and 4) annual urine drug screening (3%).
- CONCLUSIONS:** The family health team infrequently prescribed chronic opioids. Most prescribed doses were below the recommended watchful dose of morphine equivalents. This study highlights the need to improve risk assessment and monitoring for patients prescribed chronic opioids for non-cancer pain. Guideline-concordant opioid prescribing processes are underutilized in primary care and system-level interventions to improve rates are needed.

Cost-effectiveness of pharmacist care for hypertension in Japan

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OBJECTIVE: Hypertension is the single most important cause of premature morbidity and mortality in the world. In Japan, the prevalence of hypertension is 34% and about 80% are not optimally controlled. Randomized trial evidence has conclusively demonstrated the benefits of pharmacist intervention significantly reduces blood pressure, including a Canadian trial which found an 18.3 mmHg reduction in systolic blood pressure with pharmacist prescribing and care. The objective of this study was to evaluate the economic impact of pharmacist management of hypertension in a Japanese setting.

METHODS: A Markov cost-effectiveness model was developed to extrapolate potential differences in long-term cardiovascular and renal disease outcomes, using Framingham risk equations and other published risk equations. A range of values for systolic blood pressure reduction by pharmacists were considered (7.6-18.3 mmHg), to reflect the range of potential interventions and available evidence. The model incorporated health outcomes, costs and quality of life to estimate an overall incremental cost-effectiveness ratio.

RESULTS: For a systolic blood pressure reduction of 18.3 mmHg, the estimated impact is 0.21 fewer cardiovascular events per person and, discounted at 5% per year: 0.3 additional life years, 0.4 additional quality-adjusted life years and ¥712,394 cost savings over a lifetime. At the population level, it was assumed that 80% of individuals with hypertension in Japan are not optimally controlled and that 50% of eligible people would access pharmacist care; over a 30-year time horizon, it is estimated that this would result in 10.5 million life years saved and a cost savings of ¥21.3 trillion (\$CDN 255 billion). Across a range of one-way and probabilistic sensitivity analyses of key parameters and assumptions, pharmacist intervention remained both effective and cost-saving, indicating a robustness of the analyses.

CONCLUSION: Pharmacist care of hypertension is not only better, but also cost saving compared to usual care. This has important public health implications.

Cost-effectiveness of pharmacist care for managing patients at high risk for cardiovascular disease in Canada

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OBJECTIVE: The RxEACH randomized trial demonstrated that community pharmacist prescribing and care reduced the risk for cardiovascular (CV) events by 21%, compared to usual care. The objective of this study was to evaluate the economic impact of pharmacist prescribing and care for CV risk reduction in a Canadian setting.

METHODS: A Markov cost-effectiveness model was developed to extrapolate potential differences in long-term CV outcomes, using different risk assessment equations. The mean change in CV risk for the two groups of RxEACH was extrapolated over 30 years, with costs and health outcomes discounted at 1.5% per year. The model incorporated health outcomes, costs and quality of life to estimate overall cost-effectiveness. It was assumed that the intervention would be 50% effective after ten years. Individual-level results were scaled up to population level based on published statistics (29.2% of Canadian adults are at high risk for CV events). Costs considered included direct medical costs as well as the costs associated with implementing the pharmacist intervention. Uncertainty was explored via probabilistic sensitivity analysis.

RESULTS: It is estimated that the Canadian health care system would save \$4.6 billion over 30 years, if the pharmacist intervention were delivered to 15% of the eligible population. Pharmacist care would be associated with a gain of 592,049 quality-adjusted life years and avoid more than 9 million CV events. The intervention is economically dominant, i.e., it is both more effective and reduces costs when compared to usual care.

CONCLUSION: Across a range of one-way and probabilistic sensitivity analyses of key parameters and assumptions, pharmacist prescribing and care is both more effective and cost-saving compared to usual care. Canadians need and deserve such care.

Determining key quality assurance indicators for Advanced Pharmacy Practice Experiences placement site visits

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OBJECTIVES: In order to perform effective experiential education placement site visits, there should be a standard set of key indicators to assess quality assurance (QA). The objective of our study was to generate a consensus among experiential education faculty of Canadian pharmacy schools for the most important key QA indicators to be considered during APPE site visits.

METHODS: We surveyed members of the Pharmacy Experiential Programs of Canada (PEP-C) using an online two-round Delphi questionnaire, with a focus on four main categories of key QA indicators for APPE site visits, which included: (1) indicators that contribute to a learning-centered environment; (2) preceptor-related indicators; (3) student-related indicators; and 4) indicators that demonstrate placement/rotation organization.

RESULTS: Through consensus generation among PEP-C members, we identified the top three indicators for each category of key QA indicators. For category (1), the top-ranked indicators were: (i) defined roles for students; (ii) student access to drug information and patient records; and (iii) adequate physical space for student work. For category (2), the top three indicators were: (i) regular and consistent feedback provided to students by preceptor; (ii) preceptor availability; and (iii) preceptor's professionalism. For category (3), we found that (i) student involvement in pharmaceutical care processes; (ii) student providing counselling to patients; and (iii) student involvement in expanded-scope practices were the highest ranked indicators. For category (4), (i) clear learning objectives; (ii) specific examples used in the midpoint and final evaluations; and (iii) activities planned to meet learning objectives were considered to be the most important indicators.

CONCLUSIONS: Implementing a checklist of the above key QA indicators in assessing APPE sites for the entry-to-practice Doctor of Pharmacy curriculum in Canadian institutions is of high priority as we develop and advance our experiential education programs for training new pharmacy professionals.

Economic analysis of introducing a remunerated community pharmacist consultation service on influenza vaccination for Ontario seniors

Gokul Raj Pullagura, PharmD, DCM; Nancy Waite, PharmD, FCCP; Sherilyn Houle, BSP, PhD; William Wong, PhD

OBJECTIVE: In light of poor influenza vaccine uptake, health care provider recommendations continue to remain a frontline strategy in positively influencing patron vaccination decisions. This study aimed to predict the relative quality of life changes, costs and cost-effectiveness of introducing a remunerated community pharmacist-led influenza vaccination consultation service for Ontario seniors in comparison to current standard practices.

METHODS: A cost-utility analysis (CUA) was performed through decision analytic modeling. The study adopted a third-party public payer perspective and a time horizon of one year. The delivery of consultation services by community-pharmacists on influenza vaccine, billable at \$15 was compared to current standard practices (absence of a standalone remunerated consultation service). Base-case subjects included those aged ≥ 65 years accessing community pharmacy services. Data on vaccine safety and efficacy, transition probabilities, costs and utilities were primarily sourced from existing literature. In addition to the base-case analysis, multiple deterministic and probabilistic sensitivity analyses were conducted using decision analysis software, TreeAge® Pro 2017.

RESULTS: The incremental costs per quality-adjusted life-year (QALY) gained for the comparator arm relative to the standard arm in the base-case was \$993.64. The comparator arm was estimated to prevent 23 additional cases of severe influenza requiring hospitalization and 3,765 cases of mild influenza, not resulting in hospitalization or an out-patient physician visit over the standard arm. The interpretation of the base-case result was found to be robust across all sensitivity analyses. The analysis was mildly sensitive to age and vaccine uptake in the comparator arm. The projected additional costs of implementing pharmacist consultation services were estimated to be \$1.47 million/year and the anticipated benefits included a gain of 1,232 QALYs/year over current practices, yielding a net cost of \$1,193/QALY gained.

CONCLUSION: Introduction of stand-alone remunerated consultation services on influenza vaccination by community pharmacists for Ontario seniors offers a cost-effective alternative to current standard practices.

Establishing HIV point-of-care testing (POCT) programs in Canadian community pharmacies: A new “APPROACH” to HIV testing.

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OBJECTIVE: The APPROACH (Adaptation of POCT for Pharmacies to Reduce risk and Optimize Access to Care in HIV) study aimed to develop, implement and assess a pharmacist-delivered HIV point-of-care testing (POCT) program in community pharmacies.

METHODS: Community and stakeholder engagement informed the development of the testing program in this pilot study. Client linkage to care plans were developed using existing community supports/services. Pharmacists completed a comprehensive training program, including competency and proficiency assessment. Pharmacists provided eligible clients with pre-test counselling, administered a rapid HIV test and interpreted and counselled the clients on the result. Clients were linked to additional sexual health testing (for non-reactive results) or with supports and confirmatory testing (for reactive results). The program was assessed using client questionnaires and telephone interviews, pharmacist workload logs and pharmacist focus groups.

RESULTS: Over the 6-month study, 123 HIV tests were performed. Testing took approximately 30 minutes/client. One new HIV case was identified and the client was successfully linked with confirmatory testing and care. Clients reported a high degree of confidence in the pharmacist; 97% were confident the pharmacist did a good job of administering the test, 99% said testing should be routinely offered in pharmacies and 79% were willing to pay for the service. Pharmacists felt prepared to offer testing, expressed high professional satisfaction and felt the program, including linkage to care, worked well. Concerns include logistical challenges with testing pipettes and remuneration.

CONCLUSIONS: A pharmacy-based HIV testing program was successfully developed and implemented. The program was associated with high levels of client and pharmacist satisfaction. This study demonstrates the feasibility of pharmacy-offered HIV testing and the important public health role of pharmacists in disease screening and education. Future research is needed to assess the program’s cost-effectiveness, as well as the feasibility of testing for other infections (e.g., hepatitis C and syphilis).

Evaluating community pharmacists' implicit and explicit bias toward black and Arab individuals

Fahad Alzahrani, BPharm, MSc, PhD (candidate); Nancy Waite, BSc(Pharm), PharmD, FCPP; Martin Cooke, BA, MA, PhD; Michael Beazely, BSc(Pharm), PhD

OBJECTIVES: Studies have found that health care provider's implicit (unconscious) ethnic and racial bias contribute to health care disparities and affects patient and provider interactions. While research in this area has been done with physicians and nurses, little is known about pharmacists. The objective of this study was to measure pharmacists' implicit and explicit bias towards Arab and black individuals and identify personal characteristics that correlate with bias.

METHODS: A single-session, web-based survey was administered to Ontario community pharmacists who had agreed to consider participation in research in April 2017. The survey used the validated Implicit Association Test (IAT) to assess implicit/unconscious preferences and direct explicit (self-reported) questions.

RESULTS: A total of 407 community pharmacists (40% male, mean age 47, 57% White) completed the survey. Community pharmacists' self-reported, explicit bias toward Arab and black individuals, was statistically significantly less than their actual bias as measured with the IAT. 75.7% explicitly reported that had no preference for black vs white individuals and 66% reported they had no preference for Arab vs white individuals. In contrast, 75.5% of the participants had IAT scores demonstrating a preference toward White relative to black individuals; 71% reported a preference toward white relative to Arab individuals. In examining demographic variables and implicit bias, age, racial/ethnic background and, practice location were significantly associated with the level of implicit bias toward black and Arab individuals.

CONCLUSIONS: The majority of community pharmacists had IAT scores consistent with unconscious preference for white individuals. This was not associated with conscious (explicit) bias and several demographic variables were related to greater implicit bias. Future research should assess implications of this bias and develop strategies to help pharmacists understand bias and reduce its impact on patient care.

Evaluation and perspectives from community pharmacists of the Medication Management Certificate Program at the University of British Columbia's Pharmacists Clinic

Jason Min, BSc(Pharm), RPh; Jillian Reardon, BSc(Pharm), PharmD, ACPR

- OBJECTIVES:** To understand the opinions and impact on community pharmacists 6 months after completing the accredited, clinical skill-building Medication Management Certificate Program (MMCP) at the University of British Columbia's (UBC's) Pharmacists Clinic. Despite the growth of available Continuing Education (CE) offerings and the expansion of pharmacist scope of practice in Canada, there are limited offerings of immersive, experiential CE programs catering to clinical skills.
- METHODS:** Community pharmacists who completed MMCP between 2015–2017 completed a 6-month post-survey and follow-up by their primary preceptor. A mix of quantitative and qualitative questions were used to determine participant perspectives and impact on current practice. Specific learning activities (including role playing—mock patients, case presentations, documenting and reviewing chart notes and conducting live patient workups) were rated qualitatively on benefit and translatability beyond the program.
- RESULTS:** A total of 8 community pharmacists completed the 2-part intensive program: an online self-directed module and a 1-week in-person immersive experience at the UBC Pharmacists Clinic. Learning goals were developed by each learner specific to their workplace. Most respondents “agreed” that the learning activities facilitated achievement of learning goals and objectives. Respondents “strongly agreed” that they were confident in providing “comprehensive patient assessments” (mean=4.5, SD=0.25) and “creating and implementing care plans” (mean=4.5, SD=0.25) 6 months after completing MMCP. Majority of participants believed the experiential component should be longer to increase the number of patient encounters and follow-up visits. Hesitancy towards implementing changes in practice was mentioned as a barrier.
- CONCLUSIONS:** Community pharmacists find meaningful benefit to their practice 6 months following an immersive, experiential CE program focused on clinical skills. The expansion of scope of practice and primary care reform improves the opportunities for community pharmacists to showcase these skills and knowledge.

Impact of a pharmacist-administered deprescribing intervention on nursing home residents: A randomized controlled trial

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OBJECTIVES: To implement and assess a deprescribing initiative designed to safely reduce the number of unnecessary medications among long-term care (LTC) residents in Newfoundland and Labrador. Secondary objectives assessed the impact of deprescribing on resident survival, cognitive performance and disablement.

METHODS: St Patrick's Mercy Home is a 210-bed LTC facility. Residents on one unit were randomized to receive a deprescribing intervention or serve as a control. Staff were educated about deprescribing and non-pharmacologic supports before the study began. The intervention group received an in-depth medication review by a pharmacist. Individualized plans to taper and discontinue medications were developed and discussed with prescribing physicians and the resident/family. The total number of prescribed regular and as-needed medications were measured at baseline, three months and six months. Resident Assessment Instrument (RAI) scales, including Cognitive Performance and Activities of Daily Living (disablement), were also measured.

RESULTS: Sixty-six residents were eligible; 42 enrolled (n=20 intervention, n=22 control). Mean age was 84 years for both groups. At baseline, mean number of medications was 15 for the intervention and 14.55 for the control. The intervention group experienced a significant decrease of 2.45 medications at three months compared to a 0.23 increase in the control group ($p < 0.01$). A significant difference was also found at six months; the intervention group decreased by 2.78 medications and the control group increased by 0.05 ($p < 0.01$). Seven participants died during the study (n=4 intervention, n=3 control). No deaths were attributed to the intervention. No significant changes in cognitive performance or disablement were found in either group over the course of the study ($p > 0.05$).

CONCLUSIONS: The deprescribing intervention successfully reduced the number of medications taken by nursing home residents. No impact was found on cognitive function or survival in this pilot study. Expansion to additional floors is planned.

Impact of collaboration between primary care pharmacists and a neurologist in the management of headache patients: A retrospective chart review

Jillian Reardon, BSc(Pharm), PharmD, ACPR; Fairuz Siraj, BSc; Anita Kapanen, MSc, PhD

OBJECTIVES: To characterize patients referred to the University of British Columbia's Pharmacists Clinic by a neurologist for headache management and evaluate clinical outcomes related to headache burden.

METHODS: A retrospective review of all patients referred to a clinic pharmacist by a neurologist between 2014 and 2017 was conducted. Pertinent data to headache management (patient characteristics, headache type, frequency and severity of attacks, use of medications) were extracted from patient's electronic medical records for initial and follow-up pharmacist visits.

RESULTS: A total of 115 patient charts were reviewed (74.8% female, mean age 48.5 years). On initial pharmacist visit, 29.6% of patients had a diagnosis of chronic migraine; 29.6% had episodic or mixed migraines with the remainder having non-migraine headaches or being undiagnosed. Initial headache severity was reported as mild, moderate or severe in 10.4%, 42.6% and 33% of patients, respectively, with data unavailable for 14% of patients. Headache severity was not consistently reported on follow-up. Mean initial headache frequency was 19.1 attacks per month, decreasing to 7.9 on follow-up. Mean initial headache duration was 24.6 hours, decreasing to 7.2 hours on follow-up. Pharmacists recommended: non-pharmacological measures, abortive therapy alone, pharmacologic prophylaxis alone and a combination of abortive and prophylaxis therapies for 79.1%, 5.2%, 41.8% and 40% of patients, respectively. Medication overuse headache was suspected in 42.6% of patients, with educational interventions provided. Deprescribing of drugs was recommended for 51.3% of patients.

CONCLUSION: Pharmacist interventions, in collaboration with a neurologist, demonstrated clinically significant reductions in frequency and duration of headaches. Pharmacists have the unique knowledge, skills and accessibility to make meaningful impacts for headache sufferers.

Mandatory quality-related events reporting in Canada: A province-wide review over 7 years

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OBJECTIVES: There has been limited research that quantitatively analyzes quality-related events (QREs) in pharmacies. Several Canadian provinces have moved towards mandatory reporting of QREs in pharmacies to an independent third party. The objective of this project is to quantify and characterize medication-related QREs that were anonymously reported to a national error-reporting database by pharmacies in a Canadian province over 7 years.

METHODS: A retrospective analysis was conducted on medication-related QREs from pharmacies occurring between October 1, 2010, and June 30, 2017. Descriptive analysis was performed on all medication-related QREs with respect to type of incident, discoverer, medication system stages, medications and outcome.

RESULTS: A total of 131, 031 QREs were anonymously reported by 301 pharmacies in Nova Scotia to a third-party national medication safety organization. 74.87% (98, 097) was medication-related QREs. Overall, 82.05% (80,488) of reported medication-related QREs did not reach the patient (i.e., near misses) and only 0.95% (928) resulted in harm. Reports of incorrect dose/frequency (25.58%; 25,089), incorrect quantity (20%; 19,619) and incorrect drug (14.22%; 13,951) were most common. Pharmacists discovered the majority of medication-related QREs (75.17%; 73, 39). Order entry was the most frequently reported medication system stage for error occurrence, followed by prescription preparation/dispensing and prescribing. The most reported medications were levothyroxine sodium, amoxicillin and rosuvastatin. Medications with the highest proportion of QREs with harm were methadone, risperidone and warfarin.

CONCLUSIONS: Pharmacists play a significant role in patient safety and preventing medication incidents. The most frequently reported medications were among the top dispensed medications in Canada, but we also identified new high-alert medications. Our findings suggested the need for medication system stage-specific and medication-focused interventions to mitigate harm and improve patient safety.

Outcomes of diabetes management by pharmacists: The RxING practice tool

Hiroshi Okada, PhD; Yazid Al Hamarneh, BSc(Pharm), PhD; Ross Tsuyuki, BSc(Pharm), PharmD, MSc, FCSHP, FACC, FCAHS

OBJECTIVE: Optimal community-based care for patients with diabetes remains elusive. Pharmacists are highly accessible primary care providers who have a strong interest in diabetes management. The objective of this study was to evaluate the effect of pharmacist management on uncontrolled risk factors (poor glycemic control, uncontrolled blood pressure or cholesterol, or current smoking) in patients with diabetes.

METHODS: RxING is a prospective registry used by pharmacists in primary care in Alberta. Patients with diabetes must have at least one uncontrolled risk factor to be eligible (poor glycemic control, uncontrolled blood pressure or cholesterol, or current smoking). Pharmacists practice to their full scope, which may include making recommendations to the physician, prescribing, adapting prescriptions and assessing adherence. Primary outcome is change in estimated CV risk. Secondary outcomes were change in HbA1c, blood pressure, LDL-cholesterol, tobacco use and vaccination status.

RESULTS: This preliminary analysis includes the first 63 patients enrolled by 21 pharmacists. Sixty one percent of patients were male and average age was 58 years. All patients have type 2 diabetes. CV risk was reduced from 24.7% to 20.0% after 3 months ($p=0.633$). HbA1c was reduced from 8.5% to 7.6%, BP was reduced from 139/84 to 132/80, LDL-cholesterol was reduced from 1.87 to 1.46 and smoking was reduced from 13% to 12%.

CONCLUSION: RxING is a practice and implementation tool which helps pharmacists systematically evaluate and document their interventions in patients with diabetes. With widespread use, this can help with practice change and also provide real world evidence for pharmacist care.

Participant feedback about cardiovascular assessment and medication management by pharmacists at the UBC site (CAMMPUS)

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OBJECTIVES: To evaluate employee feedback from participants at the University of British Columbia (UBC) receiving pharmacist-led services on cardiovascular health during the CAMMPUS program.

METHODS: A prospective observational study of participant feedback surveys from the CAMMPUS program. Participants received a baseline cardiovascular assessment, individualized consultations for 12 months and a final assessment, all provided by pharmacists at the UBC Pharmacists Clinic. Following their final visit, participants completed a paper-based survey which included 12 Likert rating-scale and 3 open-ended questions targeting clinical care and program quality. Participants were also invited to provide additional comments. Informed consent was obtained from all participants. Responses were entered into a database, coded by one coder with themes extracted by latent content analysis.

RESULTS: Of 207 participants enrolled, 178 completed 12-month follow-up and 164 provided written feedback. Overall, participants reported a positive experience with the pharmacist's care. Three major themes were identified: (1) improved health and well-being; (2) improved self-efficacy and (3) high acceptance of working with the pharmacist. Respondents experienced progress toward achieving their health goals, increased knowledge of their health condition and heightened accountability for their own health. Respondents expressed gratitude at the collaborative care approach by the pharmacists. Recommendations to improve participant experience included: having electronic data collection surveys and increasing frequency of pharmacist follow-up visits. Participants acknowledged the pharmacist role in referring them to support services such as exercise programs and dietitian services, viewed as important in optimizing their health.

CONCLUSIONS: Pharmacists provided meaningful services in a safe and supportive environment enabling participants to set and achieve goals to improve cardiovascular health. Participants want their employer (UBC) to continue making programs like CAMMPUS available to them.

Patient experiences and perceptions of a novel pharmacist-led primary care clinic model

Jillian Reardon, BSc(Pharm), PharmD, ACPR; Daryl Allen Bisares, BSc, RRT; Anita Kapanen, MSc, PhD

OBJECTIVES: The University of British Columbia Pharmacists clinic provides comprehensive medication management to patients following a health care practitioner referral or self-referral. This study aimed to qualify patient expectations and perceptions related to care received through this pharmacist-led model.

METHODS: A two-step mixed qualitative-quantitative approach was used, consisting of a paper-based survey prior to the initial pharmacist consultation, followed by a telephone-based survey post consultation. The paper-based survey used open-ended questions to capture patient expectations of consultation. Post-consultation telephone surveys consisted of a rating scale, to solicit patient satisfaction and open-ended questions, to capture the patient experience. Patients were successively enrolled until saturation point was achieved. Qualitative content-analysis was used to identify major themes.

RESULTS: Sixteen patients completed both pre and post study elements. Ten patients completed the initial survey but not the post-survey and were considered lost to follow-up. Of the patients recruited (n=26), 50% (n=13) self-referred and 50% (n=13) were referred by health care providers. Post-consultation, 100% (n=16) of patients were very satisfied with their appointment and would recommend it to others. The majority of patients expected to obtain more information about medication adverse effects and possible drug-drug interactions, likely reflecting public perception of pharmacist scope. Content analysis in comparison of initial expectation pre- vs post-consultations found expectations were either met (38%) or exceeded (62%) for all patients. Four major themes emerged: 1) obtaining clarity around current drug therapy, 2) pharmacist accessibility (time, communication, relatability), 3) education and activation of patients to partake in self-management and 4) constructive feedback regarding degree of pharmacy learner involvement during consultations.

CONCLUSIONS: Pharmacist services exceeded patient expectations likely due to lack of awareness and experience with pharmacists practising in consultative settings. Emergent themes suggest areas of focus for pharmacists working in community-based care.

Pharmacist prescribing and care improves cardiovascular risk, but what do patients think? A sub-study of the RxEACH study

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OBJECTIVE: The Alberta Vascular Risk Reduction Community Pharmacy Project: RxEACH, was a randomized trial which demonstrated that a community pharmacy-based case finding and intervention program (including prescribing, laboratory testing and follow-up) reduced the risk for cardiovascular (CV) events by 21% when compared to usual care. The objective of this study was to evaluate patient perceptions regarding pharmacist prescribing and care in patients at high risk for CV events.

METHODS: All participants who took part in RxEACH received an invitation letter. Those who took part in the interviews provided verbal consent. Participants were asked to provide their opinions about: the care they received from pharmacists; communication between patients, pharmacists and family physicians; suggestions for sustainability Interviews were recorded and transcribed verbatim. Three reviewers (including one patient who did not participate in RxEACH) analyzed and coded the data independently.

RESULTS: Data saturation was achieved after interviewing 14 participants. Half of these were male and approximately two-thirds were older than 60. The following themes were identified: (1) Patient-pharmacist relationship: Participants highlighted the importance of having a strong relationship with the pharmacist, indicating that could enhance their level of comfort with the pharmacist. They also felt that pharmacists truly cared about them as people. (2) Health care system characteristics: The majority of the participants supported expanded scope of practice and identified it as an opportunity to fill health care gaps highlighting easy accessibility, high quality and timeliness of pharmacist services. (3) Patient reaction: Participants were extremely satisfied with the care they received and reported that they felt empowered when pharmacists encouraged them to take responsibility for their own health.

CONCLUSION: Patients are highly supportive of an advanced scope of pharmacy practice which includes prescribing, follow-up and remunerated care. Our inclusion of a patient in the analyses provided a unique perspective.

Polypharmacie chez les aînés québécois atteints d'insuffisance cardiaque : Étude populationnelle entre 2000 et 2015

Caroline Sirois, BPharm, MSc (hospital pharmacy), PhD; Carlotta Lunghi, BSc, PhD; William Bertolet; Marie-Laura Laroche, MD, PhD; Anissa Frini, PhD

OBJECTIFS : La qualité et l'évolution dans le temps du fardeau pharmacologique chez les aînés québécois atteints d'insuffisance cardiaque est peu décrit, de sorte que le rôle du pharmacien pour assurer une thérapie optimale dans cette population n'est pas bien campé. L'étude a donc pour objectifs de: 1) Décrire la proportion d'aînés atteints d'insuffisance cardiaque exposés à la polymédication (≥ 10 , ≥ 15 ou ≥ 20 médicaments/an) entre 2000 et 2015; 2) Calculer la proportion d'individus recevant des prescriptions appropriées (bêta-bloquants/IECA-ARA) et inappropriées (thiazolidinediones/nifédipine /bloquants des canaux calciques non dihydropyridines (BCC)) pendant cette période.

MÉTHODOLOGIE : Nous avons mené une étude de cohorte populationnelle avec les données du Système intégré de surveillance des maladies chroniques du Québec. Les individus de ≥ 66 ans satisfaisant à la définition d'insuffisance cardiaque, couverts par le Régime d'assurance médicaments et vivants pour la durée de l'année étudiée (entre 2000 à 2015) ont été inclus. Pour chaque individu, nous avons dénombré tous les médicaments utilisés au moins une fois durant l'année étudiée.

RÉSULTATS : La proportion d'individus utilisant ≥ 10 médicaments a crû de 61,4% en 2000 à 73,4% en 2015, alors que celle des individus utilisant ≥ 15 médicaments est passée de 28,9% à 43,5%. La proportion d'individus consommant ≥ 20 médicaments est par ailleurs passée de 10,9% à 21,0%. La combinaison bêta-bloquant et IECA/ARA a été utilisée par 26,3% de la population en 2000 jusqu'à 42,1% en 2015. La proportion d'utilisateurs de médicaments inappropriés a diminué; en 2015, 0,2% ont utilisé des thiazolidinediones; 3,8%, la nifédipine et 9,4%, les BCC.

CONCLUSION : Les aînés insuffisants cardiaques québécois sont de plus en plus exposés à la polypharmacie. Les pharmaciens peuvent jouer un rôle actif dans l'analyse des médicaments utilisés afin de s'assurer que la thérapie génère des bénéfices pour le patient.

Program evaluation: An essential component to complement continuous quality improvement in pharmacy practice

Certina Ho, RPh, BScPhm, MSt, MEd, PhD; Steven Lam, BSc, PharmD

OBJECTIVE(S): In order to ensure continuous quality improvement (CQI) in pharmacy practice is effective, it should be subjected to a periodic program evaluation process. The objective of this study was to offer recommendations and raise awareness to pharmacy administrators about how a routine program evaluation process can facilitate CQI in pharmacy practice.

METHODS: We performed a literature review and applied a program evaluation process to a standardized CQI program in community pharmacy practice (e.g., SafetyNET-Rx in Nova Scotia or COMPASS in Saskatchewan), which involved anonymous medication incident reporting, a routine medication safety self-assessment and regular staff meetings for planning and monitoring CQI action plans within the practice setting.

RESULTS: We developed a logic model, a flow chart that illustrated the association between activities and outcomes and also demonstrated their cause-effect relationships, which aligned with the various components of a standardized CQI program in community pharmacy practice. The outputs illustrated on this logic model were tangible products or pharmacy services that can be measured. Quantitative and qualitative data analyses could be performed on these tangible outputs at pre-defined timeframes. Regular monitoring would allow for trend analyses to support not only performance, but also quality improvement over time with illustrated areas of success and highlighted areas of improvement at the pharmacy.

CONCLUSIONS: While CQI activities encourage and support pharmacy practitioners to review and reflect on medication incidents, program evaluation assesses the effectiveness of such CQI activities in achieving the desired patient safety and/or patient care outcomes. The incorporation of program evaluation to complement CQI activities can help solidify and improve overall safety and effectiveness in pharmacy practice.

Shades of gray in vaccination decisions: Understanding Ontario community pharmacists' perspectives of and experiences with seasonal influenza vaccine hesitancy

Gokul Raj Pullagura, PharmD, DCM; Richard Violette, MA; Sherilyn Houle, BSP, PhD; Nancy Waite, PharmD, FCCP

OBJECTIVE: Limited research exists around influenza vaccine hesitancy (VH) experience at the community pharmacy. This study aims to understand practising community pharmacists' (CPs): attitudes towards influenza VH, behaviour with those hesitant to receive the influenza vaccine and experiences with influenza VH at the community pharmacy.

METHODS: A semi-structured interview guide was developed and used to conduct in-depth telephone interviews with CPs. Twenty-two CPs practising in Ontario were recruited through purposive sampling. The CPs interviewed were primarily certified to provide injections (91%) and had >20 years of experience (80%). All interviews were audio-recorded and transcribed verbatim. The data was analyzed using a thematic content analysis framework.

RESULTS: Using a qualitative interpretive approach, the data was categorized into 4 primary and thirteen sub themes. Our analysis suggested that pharmacists routinely interact with individuals hesitant to receive the influenza vaccine, yet, their identification and the pursuant interaction was primarily passive in nature, often initiated by the patron. Furthermore, pharmacists perceived vaccination decisions as binary outcomes as opposed to movement across a continuum, thereby limiting engagement with those hesitant to receive the vaccine. Additionally, CPs recognized the importance of being educated on issues surrounding influenza vaccines and addressing related patron concerns, however, barriers such as time, current remuneration and staffing appeared to form significant bottlenecks to optimal patron engagement on vaccinations and related issues.

CONCLUSION: Vaccine hesitancy at the community pharmacy is a complex phenomenon, ensuring optimal pharmacist engagement in this space requires a multipronged approach including, but not limited to, modifying pharmacists' attitudes towards VH, equipping pharmacists with tools to help initiate and steer VH conversations and resolving existing pharmacy workflow barriers and issues of perceived low remuneration.

Small area variation analysis of drugs prescribed to older people: Identifying practice quality issues

Caroline Sirois, BPharm, MSc, PhD; Maude Laberge, PhD; Houssein Missaoui, BSc; Bernard Candas, PhD

OBJECTIVES: There are unexplained geographical variations in the use of different drug classes. The objectives of this study were 1) to develop a classification methodology of prescription drugs utilization by mutually exclusive drug classes; 2) to estimate small area variations in prescription of these drug classes in the older population in Quebec.

METHODOLOGY: This population-based study design used small area variation analysis methods to estimate geographical variations and rank prescription drug classes by their level of variation. Prescription drug data were extracted from the Régie d'assurance maladie du Québec database for the fiscal year 2016-2017 for all individuals aged 66 years and over. Age-sex adjusted prescription rates were calculated for each of the 93 local health areas. Systematic components of variation (SCV) and extremal quotients were calculated for each therapeutic indication. Drug classes were ranked based on SCV (>10: very high variation; 5-10: high; 3-5: average; <3: low).

RESULTS: After excluding drugs for which there were very few users and drugs for very rare diseases, the study population consisted of 1,086,248 older individuals. There were 597 denominations which were classified into 47 therapeutic targets. SCV varied between 0.5 for antihypertensive drugs and 162.5 for HIV drugs, with a SCV weighted average of 2.8. The top five therapeutic targets in terms of the numbers of consumers had SCV ranging between 0.6 and 2.7. Three therapeutic targets were identified as highly used and as having high utilization variations: benzodiazepines, laxatives and non-ORL corticoids.

CONCLUSION: Our findings show variations in the consumption of many classes of prescription drugs in the older population of the province of Quebec. Among them are several common medications and medications for which no scientific uncertainty can explain practice variations. The results can support prioritization strategies to improve practice quality, reduce variations and potential inappropriate use of prescription drugs.

The availability of pharmacists with Additional Prescribing Authorization in Alberta in relation to vulnerable populations' distribution: A cross-sectional study

Mhd. Wasem Alsabbagh, PhD; Sherilyn Houle, BSP, PhD; Nancy Waite, PharmD, FCCP

OBJECTIVE(S): In order for vulnerable/high-risk patients to benefit from advanced services, such as pharmacist independent prescribing, pharmacists must be accessible to these patient groups. To better understand this relationship, this research examines the geographical relationship between Alberta pharmacists with Additional Prescribing Authorization (APA) and the neighbourhood's proportion of vulnerable populations, such as low-income people or recent immigrants.

METHODS: Publicly available data were extracted from the Alberta College of Pharmacists' website. Pharmacists with APA were grouped depending on the postal codes of their main self-reported place of practice. Pharmacists whose main place of practice was in a hospital or who did not declare a place of practice were excluded. Postal codes were then converted to dissemination areas (DAs) using postal code conversion file plus (PCCF+) and were linked to an area's income quintiles (lowest quintile versus other areas) and immigrant tertile (highest tertile versus other areas). The mean number of APA pharmacists per dissemination area was compared using t-test; and the number of APA pharmacists per dissemination area was compared using negative binomial regression.

RESULTS: The records of 3,742 pharmacists with 1,054 unique postal codes were included in the study and were linked to 753 unique DAs. Almost one third (34.5%, n=1,289) had APA. The mean number of APA pharmacists per DA was 1.49 in low-income areas and 1.79 in other areas ($p=0.34$). Low-income areas had 0.18 less APA pharmacists than other areas ($p=0.10$). However, the mean APA pharmacists per DA was higher in areas with highest immigrants tertile (2.92 versus 1.65; $p=0.18$). These areas had 0.58 additional APA pharmacists ($p=0.06$).

CONCLUSION: The distribution of pharmacists with APA seems to be aligned with vulnerable populations' distribution. Future research should examine the utilization of expanded scope of practice in relation to vulnerable populations' distribution.

The use of potentially inappropriate medications in older adults in Quebec: A population-based study

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OBJECTIVES: To assess the prevalence and incidence of potentially inappropriate medications (PIMs) use in community-dwelling older adults ≥ 66 years with chronic diseases in Quebec.

METHODS: A retrospective population-based cohort study was conducted using the Quebec Integrated Chronic Disease Surveillance System (QICDSS) databases. The QICDSS includes data on drug claims for community-dwelling older adults insured by the public drug insurance plan (90% of people aged ≥ 65 years). Individuals aged ≥ 66 years who were continuously insured with the public drug plan between April 1, 2014, and March 31, 2015, were included for the measure of prevalence ($n=1,068,653$). Among this population, individuals who initiated a PIM (i.e., did not use any PIM in the previous year) were identified for the measure of incidence ($n=515,154$). PIMs were defined using the 2015 Beers criteria.

RESULTS: Around half of the older adults (48.7%; $n=520,162$) were prescribed at least one PIM. Of these, 62.9% were women, their mean age was 75.7 years (SD 7.2) and their mean number of medications was 11.5 (SD 6.1). The most prevalent PIMs were short- and intermediate-acting benzodiazepines (22.3%), proton-pump inhibitors (20.5%), long-acting benzodiazepines (5.5%), atypical antipsychotics (5.2%) and antidepressants (5.0%). Among prevalent users of PIMs, 15.7% ($n=80,674$) initiated a PIM during the study period; 55.6% were women, their mean age was 74.6 years (SD 7.2) and their mean number of medications was 10.3 (SD 5.7). The PIMs most frequently initiated were similar to the one used by prevalent users, i.e., short- and intermediate-acting benzodiazepines (40.2%), proton-pump inhibitors (37.2%), long-acting benzodiazepines (9.8%), antidepressants (9.1%) and atypical antipsychotics (9.0%).

CONCLUSIONS: PIM use is common in community-dwelling older adults with chronic diseases. Pharmacists can play an important role in optimizing the pharmacotherapy of older patients.

ToolQit: An evidence-based communication and decision-guiding tool to evaluate the complexities of QT prolongation

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OBJECTIVES: Current pharmacy practice management systems screen drug-drug interactions and generate alerts pertaining to potential QT prolongation. However, pharmacists have found these alerts to be unspecific for patient risk factors, causing confusion and alert fatigue. The objective of this study was to create ToolQit, an evidence-based communication and decision-guiding tool, to facilitate interprofessional collaboration between pharmacists and prescribers with respect to clinical decision-making on QT prolongation related patient care concerns.

METHODS: We performed a comprehensive literature review and prepared a draft version of ToolQit. We invited frontline pharmacists to try using ToolQit in practice and then participate in our in-person focus group sessions or online questionnaire to provide us with their feedback and recommendations to ToolQit. Qualitative data, that is, focus group data, were de-identified, transcribed, coded and analyzed for thematic analysis.

RESULTS: A total of four focus groups were held and an online questionnaire (with the same set of questions as in the focus group discussion) was distributed to any participants who were unable to attend our scheduled focus groups. The total number of participants was 17; of those, 15 were licensed Ontario pharmacists and 2 were from Alberta. Distribution of the primary practice setting of the participants included community pharmacy, long-term care, family health teams and specialty hospital practice. Based on the feedback and comments received, we revised ToolQit and re-designed it into a one-page document for ease of use, as participants preferred a condensed documentation tool in order to support the needs of pharmacists in different practice settings.

CONCLUSIONS: ToolQit is an evidence-based communication and decision-guiding tool designed to evaluate the complexities of QT prolongation. It is designed to increase pharmacist and prescriber awareness of factors that may increase QT prolongation risk and facilitate a standardized information-gathering process when documenting QT-prolonging medications and/or drug-drug interactions.

Will I lose my license for that? A closer look at Canadian disciplinary hearings and what it means for pharmacists' practice to full scope

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OBJECTIVE: Concerns about liability from clinical errors have been cited as a barrier preventing greater adoption of practice change. Our objective was to determine the most common actions or omissions that result in disciplinary action for pharmacists and the restrictive actions imposed.

METHODS: Canadian disciplinary reports were reviewed. Cases were coded as charges of professional misconduct, unskilled practice, or dishonest business practices.

RESULTS: There were 558 disciplinary cases from ten provinces that occurred between January 2010 and July 2017. Professional misconduct charges commonly involved stealing/diverting or inappropriately dispensing narcotic drugs, pharmacy supervision/premises charges and refusing to co-operate with the college. Charges of unskilled practice included dispensing the wrong drug, failing to assess the appropriateness of a drug order, providing the wrong dose and failing to counsel. Fraudulent billing practices and accepting rebates from generic drug companies were the most common dishonest business practices. Professional misconduct, unskilled practice and dishonest business practice charges were involved in 342 (61%), 169 (30%) and 191 (34%) cases, respectively. Most cases occurred in community pharmacies and were not caused by an isolated clinical error. Fines were the most common penalty, followed by temporary license suspensions, professional development and reprimands. License revocations were the least common (4%), often involving professional misconduct.

CONCLUSIONS: This review suggests that disciplinary action against a pharmacist for an isolated, unintentional clinical error is uncommon and that losing a license is rare. Fear of disciplinary action should not be a barrier to practice change provision of full-scope patient care services.

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

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