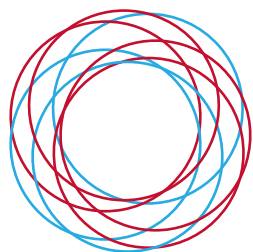


SPECIAL SUPPLEMENT TO THE
CANADIAN PHARMACISTS JOURNAL



Canadian Pharmacists
Conference 2015

Innovation and Collaboration

Pharmacy Practice Research Abstracts



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This year, the Canadian Pharmacists Association (CPhA) and the Ontario Pharmacists Association (OPA) 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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Specialized clinical services offered in community pharmacy in Quebec: A survey of pharmacy owners

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- OBJECTIVES:** Many pharmacies have developed and offer specialized clinical services. However, these initiatives are not well documented. The purpose of this initiative was to estimate the prevalence and describe the nature of specialized clinical services offered in Quebec pharmacies.
- METHODS:** A survey was conducted among Quebec pharmacy owners. Using Dillman modified method, pharmacists were invited to complete a survey to document the specialized clinical services offered, their perceptions of the benefits and barriers to the provision of services and the pharmacies characteristics.
- RESULTS:** A total of 511 out of 1505 pharmacy owners (34%) completed the survey; the sample was representative of Quebec pharmacies. Eighty-one percent of pharmacies offer at least one specialized service, with an average of three per pharmacy. Most prevalent services include anticoagulation (45%), hypertension (36%), and diabetes (28%). For each of these conditions, the mean number of patients seen annually is 22, 60 and 54, respectively. The mean duration of the initial and follow-up visits vary between 17-25 and 8-13 minutes, respectively. Seventy-seven (77%) pharmacies plan to offer at least one additional service in the next year. Perceived benefits of offering those services include the establishment trusty relationship (61%), customer loyalty (58%) and personal satisfaction (56%), while the main barriers are the lack of time (73%) and inadequate monetary compensation (62%).
- CONCLUSIONS:** In Quebec, most pharmacies offer specialized clinical services. The majority of services are related to the prevention of cardiovascular disease. To facilitate the implementation of clinical services work organization and remuneration must be addressed. There is strong evidence that pharmacist care improve patient's glycemic control. However, the sustainability and durability of such interventions beyond the research period is not known. RxING was the first trial of pharmacist prescribing in diabetes, and showed an improvement in A1c of 1.8% over 6 months.

Pharmacists' self-described professional role: A shift in emphasis

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- OBJECTIVES:** How pharmacists define their professional role is critical in understanding current practice and future professional development needs. The objective of this study is to understand how Alberta pharmacists perceive their role.
- METHODS:** Pharmacists on the Alberta College of Pharmacist's clinical register were invited to complete a web-based survey (October 1-31, 2014); 2 reminder emails were sent. Survey questions were based on literature and focus group interviews. Two open-ended questions asked about professional role. A quantitative content analysis was performed.
- RESULTS:** Overall, 416 pharmacists completed the survey (response rate 10.4%) and 146 (35%) had Additional Prescribing Authorization (APA). Respondents were mostly female (69%), in practice for >10 years (60%) and working in community (65%). A total of 1120 response items on roles were obtained and categorized using NAPRA standards. The most common role categories were patient care (44%), communication/education (22%), and collaboration (10%). Product distribution comprised 3% of responses. Most cited roles described by pharmacists were educator, drug/medication expert, medication management, collaborator/team member and patient advocate. Pharmacists with APA and those without APA had similar response rates within most of the role categories. Interprofessional collaboration and safety roles were emphasized more by pharmacists with APA. Communication/education and product distribution were cited more often by pharmacists without APA.
- CONCLUSIONS:** Our data indicate that pharmacists perceive their roles primarily in the categories of patient care, communication/education, and collaboration. Pharmacists also describe their role as drug therapy expert. This is a shift from previous research indicating an emphasis on product-focused roles.

Community pharmacists' use of digital health technologies in practice

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- OBJECTIVES:** To discuss the current state of electronic system use in community pharmacy practice based on a survey of Canadian community pharmacists and the implications of these findings on pharmacists' expanded scope of practice.
- METHODS:** Infoway in partnership with CPhA invited community pharmacists to participate in a survey to understand their use and perceived benefits of digital health technologies in practice. An online survey was distributed by CPhA and provincial pharmacy associations and was open from April 15 to May 12 2014. Results were weighted based on Pharmacist Workforce statistics (CIHI, 2012).
- RESULTS:** 447 surveys were completed; 192 respondents were from a province with a fully implemented Drug Information System (DIS) and 102 had access to laboratory test results through a provincial information system.
- Those with access to a DIS are using it frequently with 52% accessing it through an integrated system.
 - 92% stated that DIS increased quality of care with leading clinical benefits being access to patient information, pharmacist prescribing activities, conducting medication reviews and continuity of patient care.
 - Majority with access to laboratory results reported improved productivity (57%) and quality of care (87%).
 - Those without access to a DIS or laboratory results would overwhelmingly like access (96% and 91%).
 - EMR-generated prescriptions are increasingly prevalent; while these are associated with better legibility, there are opportunities for further benefits.
- CONCLUSIONS:** Community pharmacists are frequently using digital health in practice and recognize the productivity and patient care benefits of these technologies. Digital health is a key enabler for moving expanded scope of practice services forward.

Pharmacist immunizers: A preliminary analysis of their experiences and perceptions of pain

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OBJECTIVES: In 2012, Ontario pharmacists were granted immunization privileges for administering influenza vaccines to the public. No studies exist that examine pharmacist immunizers' perception of their role as immunizers and the impact of inflicting pain as part of delivering care. This study explored the experiences and practices of pharmacist immunizers and the impact of pain on their practice.

METHODS: Semi-structured interviews were conducted with 10 pharmacists in the Greater Toronto Area. Transcribed interview data were entered into NVivo (version 10), coded and analyzed via thematic analysis.

RESULTS: Preliminary analysis revealed 5 main themes: Expanded scope of practice as an enhancement and challenge to relationships, New work-life satisfactions and demands, Minimization of patients' pain experience, Recognition of patients' fear and Limited formal knowledge of management of pain and fear. Although pharmacists felt an improvement in their relationship with patients, they experienced no change in their relationship with physicians. Pharmacists felt satisfied in their new role, despite the heavy demand on workload. Pharmacists felt that immunization pain was not a factor and that pain management was not necessary. Vaccinating children was found to be a challenging experience and fear was identified as more important than pain. Pharmacists' main focus was on injection technique when trying to minimize pain.

CONCLUSIONS: Pharmacists expressed an overall positive experience with immunizing patients, reporting that pain had no impact on their practice. Fear, on the other hand, was a problem when immunizing children. These findings suggest that education is needed with respect to techniques to manage needle fear.

A comparison of drug therapy problems identified in patients eligible and ineligible for provincial medication review programs in Canada

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OBJECTIVES: Most provinces have provincially sponsored programs that reimburse community pharmacies for performing medication reviews. However, the eligibility criteria of these programs vary widely between provinces. The purpose of this study was to compare the mean number of drug therapy problems (DTPs) in patients eligible and ineligible for a medication review in each province that offers the service.

METHODS: Adult patients requesting a refill prescription from three different community pharmacies in Saskatoon, Saskatchewan, over a 12-week period underwent a medication review with a pharmacist and the number of DTPs identified was documented. Patient information gathered was used to determine medication review program eligibility. Data was collected from November 2013 to February 2014.

RESULTS: Forty nine patients were included in the study. Mean number of DTPs in eligible patients was; 6.2 (SK), 5.91 (NB), 5.88 (NL), 5.72 (BC), 4.76 (AB) and 4.54 (PEI, NS and ON). Mean number of DTPs in ineligible patients was 2.88 (NL), 2.63 (NB), 2.64 (SK), 2.00 (BC), 1.92 (AB) and 1.81 (PEI, NS, ON). Patients eligible for the programs were found to have significantly more DTPs than ineligible patients in all provinces.

CONCLUSIONS: Despite the variable eligibility criteria used by all provincial medication review programs in Canada, all programs appear to identify patients with significant number of DTPs. Additional study is required to determine the optimal eligibility criteria that will ensure the most cost-effective use of health system resources.

Safety alerts as drivers for the Pharmaceutical Opinion Program: A pilot study to reduce potential hospitalizations due to preventable drug-drug interactions

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- OBJECTIVES:** Community pharmacists are in a unique position to prevent serious drug-drug interactions (DDIs). This study aims to reduce the occurrence of DDIs associated with potential hospitalizations, offer continuing professional development opportunities while providing a financially viable business model via the Pharmaceutical Opinion Program (POP) in Ontario.
- METHODS:** Information on evidence-based DDIs was disseminated to 51 participating pharmacies via ISMP Canada Safety Alerts. Participants reviewed the alerts, identified and resolved the DDIs through the POP accordingly. The number and types of pharmaceutical opinions submitted by participants before and during study period were collected. Qualitative data was obtained through focus group sessions.
- RESULTS:** Of the 2577 POPs claimed during study period, 226 were DDIs. A total of 64 interventions were made with respect to evidence-based DDIs. This can be extrapolated to conclude that these interventions might have averted 64 potential hospitalizations or instances of patient harm from DDIs. Qualitative analysis of the focus groups revealed the value of Safety Alerts, which enabled pharmacists to acquire new information or reaffirm existing knowledge of DDIs, and opportunities to further incorporate POP into daily workflow.
- CONCLUSIONS:** Through disseminating evidence-based DDIs via ISMP Canada Safety Alerts, this study offers an innovative strategy to capture and reduce DDIs associated with potential hospitalizations; deliver continuing education to front-line pharmacists; and provide business opportunities through which cognitive services are reimbursed through the POP. The findings highlight growing opportunities to further utilize POP and demonstrate the effectiveness of pharmacists' interventions in resolving DDIs and conferring cost savings to society.

Opinions of British Columbia pharmacists and physicians on medication management services provided by pharmacists

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- OBJECTIVES:** As pharmacists roll out medication management (MM) services throughout Canada as part of expanded scope of practice legislation in all provinces, little is known about the opinions of pharmacists and physicians towards MM. The objective of this study was to elicit opinions about MM from pharmacists and physicians in British Columbia (BC).
- METHODS:** A cross-sectional online survey was designed to gather the opinions of pharmacists and physicians with respect to MM services in BC.
- RESULTS:** 119 pharmacists and 146 physicians completed the questionnaire. The majority of pharmacists were female, had only a baccalaureate degree, and were staff members. Of the physician respondents, 70% were male and 95% were family practitioners licensed for an average of 25 years. Both pharmacists and physicians felt the most important component of MM services was medication review, physicians felt the next most important was medication adherence services while pharmacists felt it was counseling on non-prescription medications. Physicians most preferred MM services to be performed on a referral basis (referred from physicians). The majority of both groups indicated that they believe additional health services are needed to help patients optimize the use of their medications and each felt that they were the most important health care provider in providing this service. Both groups agreed that MM would most likely result in decreased costs and decreased utilization of the health care system.
- CONCLUSIONS:** Pharmacists and physicians appear to mostly agree on the beneficial aspects of MM; and both want to be involved in helping patients optimize their medication use.

Community pharmacy-based A1c screening: A Canadian model for diabetes care

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- OBJECTIVES:** Point-of-care HbA1c screening devices are a valuable tool that community pharmacists can use to monitor patients with diabetes and improve the overall management of the disease. Here, we report data from screening of 1111 patients at A1c clinics held at several community pharmacy locations across Canada.
- METHODS:** Community pharmacies across Canada offering A1C screening as part of their professional services programs were invited to upload screening data to a central web-based database. A1c analysis was performed using the Bayer A1c Now® meter. Patient recruitment and approach to A1c screening clinics were at the discretion of the participating pharmacies and were not standardized. Data collection took place over a period of 8 months.
- RESULTS:** The majority of patients screened (59.1%) had inadequate glycemic control. Glycemic control was generally poorer amongst patients on more intensive treatment regimens. A total of 1711 clinical interventions were performed by pharmacists. An average of 2 interventions were performed per patient, and we observed a trend towards increased numbers of interventions in patients with poorer glycemic control. The prevalence of specific types of interventions showed an apparent shift from predominantly pharmacist-directed interventions in patients with better glycemic control, towards increased prevalence of physician-directed interventions in patients with poorer glycemic control. In those provinces where pharmacists have been granted advanced scope of practice, pharmacists, on average, performed an increased number of interventions per patient.
- CONCLUSIONS:** These results illustrate the prevalence of suboptimal glycemic control amongst diabetic patients in the community. Our intervention data suggests that pharmacists are willing to make clinical interventions in response to A1c screening results that are tailored to meet the specific needs of the individual patient. Moreover, continued expansion in scope of pharmacy practice may contribute to improved management of patients with diabetes.

Reaching the hard to reach: The Manitoba pharmacist-initiated smoking cessation pilot study

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In Manitoba, 1/5 of residents smoke. It is well established that smoking rates are even higher in the hard to reach population of economically disadvantaged individuals. Community pharmacists are accessible and knowledgeable health care professionals ideally situated to provide smoking cessation counseling.

OBJECTIVES: The feasibility, impact and cost effectiveness of a community pharmacist initiated smoking cessation program was evaluated.

METHODS: Patients were enrolled into the program beginning in January 2014. All Manitoba residents over the age of 18 who were covered under Manitoba Employment and Income Assistance were eligible for enrolment. Pharmacists trained in smoking cessation from 12 pharmacies enrolled patients interested in quitting smoking. Smoking cessation counseling and medication therapy was provided to all patients at no charge. The study tracked self-reported quit rate to 6 months.

RESULTS: Of the 119 patients enrolled, 2 (1.7%) successfully quit smoking and 41 (34.5%) patients reduced the amount they were smoking by an average of 16 cigarettes per day. Other health improvements, such as reductions in cough, were reported in 63% of patients. Pharmacists spent an average of 2.5 hours counseling each patient. The cost of the program was calculated at an average of \$470.18 per patient with an estimated incremental cost effectiveness ratio of \$4239-\$8252 per quality adjusted life year over the status quo.

CONCLUSIONS: This program provides evidence that a smoking cessation clinical service offered by a community pharmacist is a cost effective method to improve quit rates in a hard-to-reach, resistant population. With minor modifications, this program could be expanded throughout the province.

Improving hypertension detection and management in the community: A nationwide approach through a grocery/pharmacy chain

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OBJECTIVES: Undiagnosed, untreated, and undertreated hypertension remains a significant public health burden. Additional methods of detection and management are needed. Community pharmacies are accessible, visited frequently and are staffed with health professionals that can play an important role in hypertension care.

METHODS: We conducted a before-after study in 470 Loblaw/DrugStore pharmacies across Canada from February 1 to 28, 2014. In-store signage and newspaper ads offered to any individual the opportunity to have a blood pressure (BP) consultation from a pharmacist. We followed CHEP-recommended procedures for BP measurement and used the validated PharmaSmart PS2000. All patients received feedback and recommendations based on their results as well as educational material endorsed by Hypertension Canada. Significantly elevated BP results were communicated to the subject's family physician according to a standardized protocol. In some locations we had a dietitian available to discuss low-sodium food choices and in some we performed a 60 day follow-up in subjects with SBP>150 mmHg.

RESULTS: We assessed 21,708 individuals (average age 58.7 (SD 16.8) y, 53% female). Average BP was 134.4 (SD 16.6)/78.3 (SD 11.3) mmHg, heart rate was 75.9 (SD 12.6), 58% self-reported taking antihypertensive medications in the past month and 21% had diabetes. In those without diabetes, 85% were at the BP target of <140/90 mmHg. In those with diabetes, 31% were at the BP target of <130/80 mmHg.

A total of 3315 (15%) had a systolic BP >150 mmHg, for which 499 had pharmacy follow-up completed. Upon follow-up, 45% self-reported a reduction in BP, and 71% agreed or strongly agreed that in-pharmacy BP measurement had a positive impact on their health.

CONCLUSIONS: In a >21,000-subject community-based screening program, >26% had BP levels above target. Pharmacy-based BP measurement is feasible, reaches many individuals in the community, and identifies those needing better hypertension care. Patients felt that the program improved their health.

A randomized controlled knowledge translation intervention in Alberta community pharmacies using the PARiHS framework

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Pharmacists' scope of practice, and remuneration for clinical services, is expanding. However, uptake of these services into practice continues to be suboptimal. While numerous barriers have been identified, little work has specifically addressed solutions.

OBJECTIVES: To explore the acceptability, and utility, of a facilitated intervention in community pharmacy practice to improve the provision of medication management services.

METHODS: A cluster-randomized before-after design randomized ten pharmacies in Alberta to facilitated intervention or usual practice. Intervention includes task-focused facilitation from an external facilitator based on a knowledge translation framework, with the goal of supporting greater provision of medication management services. All full-time pharmacy staff were interviewed and surveyed individually to identify barriers. Facilitators worked with staff and management to implement proposed solutions that fit within their workflow model. Outcomes include the intervention plan, the acceptability and uptake of solutions implemented as measured by staff interviews, and the change in the number of formal and documented medication management services.

RESULTS: The intervention period will conclude in early 2015. The highest priority barriers identified and addressed include documentation, scheduling and delegation, and greater use of existing technology. Facilitators assisted pharmacies with simplifying forms, ensuring protected time for patient interview and documentation, involving all team members in identifying eligible patients, and greater utilization of dispensary software for patient monitoring and documentation.

CONCLUSIONS: Pharmacies require both workflow and structural modifications to better support expanded services. External facilitation provides an opportunity for pharmacies to identify and address barriers to increase service provision.

Community pharmacies providing influenza vaccines in Ontario: A descriptive analysis using administrative data

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OBJECTIVES: To describe Ontarians who received influenza vaccine from community pharmacies since the program launch in 2012, and compare them to those who received influenza vaccines through physician offices.

METHODS: We conducted a descriptive analysis of physician and pharmacy billing claims for influenza vaccination during the 2012-13 and 2013-14 influenza seasons, using the Ontario Health Insurance Plan (OHIP) database for physician billing claims and the Ontario Drug Benefits (ODB) database for pharmacy billing claims. We compared individuals vaccinated in physician offices with those vaccinated in community pharmacies based on age, sex, rural residence, socio-economic status, and the presence of selected chronic conditions.

RESULTS: The number of individuals vaccinated in community pharmacies increased from 246,794 in 2012-13 to 764,922 in 2013-14 (net increase: 518,128). The number of individuals vaccinated in physician offices declined slightly from 2,006,803 to 1,940,550 (net decrease: 66,253). In 2012-13, 49,926 individuals vaccinated in community pharmacies had not received an influenza vaccine from a physician office since at least 1999. This increased to 135,112 individuals in 2013-14. Compared to individuals vaccinated in physician offices, those vaccinated in community pharmacies were younger, more likely to live in rural areas, more likely to live in areas with higher neighbourhood incomes, and less likely to have many (but not all) of the selected chronic conditions.

CONCLUSIONS: The policy allowing pharmacists to administer influenza vaccines in community pharmacies seems to have increased vaccine accessibility, but the profile of individuals who receive influenza vaccination through community pharmacies differs from those who receive influenza vaccines through physician offices.

Evaluation of pharmacy services: Capturing the patient perspective

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- OBJECTIVES:** To understand the patient perspective about the evaluation of pharmacy services including the patient perspective on the responsibilities of pharmacists. The findings from this study will assist in identifying which parameters patients would consider important components of a pharmacy services evaluation framework that may be applied to the broad spectrum of pharmacy services.
- METHODS:** A generic qualitative approach was used to conduct this inductive, exploratory study. Semi-structured interviews were conducted with patients who self-reported as having regular and ongoing contact with a pharmacist. Data were organized using a micro-coding technique using N*VIVO 10 software. Thematic analysis was used to interpret the findings by identifying key themes and relationships related to an evaluation framework structure.
- RESULTS:** Eleven patients were interviewed. Participant responses varied considerably with regard to perception of pharmacists and appropriate measures for evaluating pharmacy services. However, emergent themes of accessibility, convenience of services, the importance of building a patient-pharmacist relationship, and effective communication between pharmacists and patients as well as physicians were identified. Consensus was less apparent in the views patients held of pharmacists as members of the health care team versus service providers, and to what extent the scope of practice for pharmacists should be expanded.
- CONCLUSIONS:** This study has highlighted the importance of gathering input from patients to improve evidence-based policy making. The process is expected to incorporate patient needs and expectations into the development of an evaluation framework for pharmacy services.

Deprescribing guidelines for the elderly: How developmental evaluation is strengthening our process

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- OBJECTIVES:** Deprescribing guidelines are one solution to address inappropriate medication use. Optimal approaches to developing and implementing such guidelines with primary and long-term care practitioners have yet to be identified. We aimed to develop and implement three evidence-based deprescribing guidelines (proton pump inhibitors, benzodiazepines, antipsychotics). Our evaluation aims to provide an understanding of factors associated with successful guideline development, implementation, and uptake, and how developmental evaluation improves such processes.
- METHODS:** Guideline development using AGREE-II (Appraisal of Guidelines for Research and Evaluation), and GRADE (Grading of Recommendations Assessment, Development, and Evaluation) to rate quality of evidence and strength of recommendations. Developmental evaluation using ethnographic methods: observations and interviews with guideline development and site implementation teams, and facilitated feedback sessions to discuss and agree on process improvements.
- RESULTS:** Two evidence-based deprescribing guidelines have been developed. Process components and resulting decision-aid algorithms will be presented. Factors that consistently facilitated successful development included 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. Site implementation experience suggests practitioners are more interested in how to implement deprescribing approaches vs evidence to support stopping medications, that practice site priorities and processes shape ability to respond and that aligning guidelines with existing processes is critical to implementation success.
- CONCLUSIONS:** Optimizing a deprescribing guideline development and implementation process aims to facilitate clinicians' ability to reduce inappropriate medication use. Developmental evaluation contributes to improvement of processes used to develop and implement such guidelines.

Capturing activities performed by pharmacists in family health teams

Ulrika Gillespie, MScPharm, PhD; Simone Dahrouge, PhD; Lisa Dolovich, BScPhm, PharmD, MSc

OBJECTIVES: To describe the range and proportion of time spent on activities performed by pharmacists working in Ontario family health teams (FHTs).

METHODS: This descriptive study was conducted using a web-based survey distributed to FHT pharmacists in Ontario. The survey was constructed using information from a preceding set of semi-structured telephone interviews with 10 purposefully selected pharmacists. The survey included a list of activities, grouped into 5 main and 20 sub categories. The participants were asked to estimate the percentage of time spent on each category of activities. The survey results were analyzed using descriptive analyses with a content analysis of open-ended responses.

RESULTS: Out of 155 invited pharmacists, 70 (45%) completed the survey. The mean age was 43 (SD 10) years. Respondents had a mean of 4 (SD 3) years of experience working in a FHT. Almost all engaged in direct patient care; managing single therapeutic issues including involvement in clinics (94%), general medication reviews (66%) and medication reconciliation post hospitalization (59%). Almost all provided education and drug information that was unstructured to physicians and others (84%). Pharmacists were most commonly involved in smoking cessation (61%) and diabetes (57%) clinics. Pharmacists felt they could make the most impact on inappropriate prescribing (91%), medication adherence (91%), the number of medications people are taking (87%) and adherence to guidelines (81%).

CONCLUSIONS: The majority of pharmacist time in FHTs is spent on direct patient care and on providing unstructured education and drug information to physicians. These activities should help improve the prescribing and use of medications.

Facilitators and barriers of Ontario pharmacists as providers of influenza vaccination: Surveys of pharmacists and patrons of community pharmacies

Wasem Alsabbagh, PhD; Lisa Wenger, PhD; John Papastergiou, BScPhm; Nedzad Pojskic, PhD; Lalitha Raman-Wilms, PharmD; Eric Schneider, PharmD; Nancy Waite, PharmD

- OBJECTIVES:** To understand Ontario pharmacists' and patron perceptions of barriers and enablers to influenza vaccination in the community pharmacy setting.
- METHODS:** Community pharmacists, identified through the Ontario College of Pharmacists database, completed an online survey of attitudes related to providing the flu vaccine. Patron attitudes were evaluated via a survey of adult patrons of six community pharmacies in the Greater Toronto Area who had not received flu vaccination from a pharmacist within the past year. This survey was completed on paper, or electronically using an ipad or online.
- RESULTS:** Of all 4239 eligible pharmacists, 780 pharmacists (18.4%) participated in the survey. Pharmacists reported pharmacy workflow and staffing as the highest barriers and interest in improving patient's health, ability to demonstrate new pharmacist's role to public and the desire to increase patient flow to the pharmacy were the highest facilitators. Among the 541 patrons who participated in the second survey (RR 58.1%), key reasons for not going to community pharmacist for the flu vaccine included lack of interest in the vaccination itself, regardless of provider (n=225, 41.6%) and a lack of awareness that pharmacists can provide (n=164, 30.3%). Facilitators of pharmacist-administered vaccination were flexible vaccination hours, short wait time, and private administration rooms.
- CONCLUSIONS:** Logistical and access issues are challenges for pharmacists and important facilitators for pharmacy patrons not yet accessing this service. Beyond continued education around the value of the flu vaccine, improved marketing and targeted approaches might enable pharmacists to reach those not currently engaging with pharmacists as immunizers.

Understanding Ontario pharmacists' personal influenza vaccination rates

Blake Ziegler, PharmD candidate; Wasem Alsabaggh, PhD; Sherilyn Houle, PhD; Lisa Wenger, PhD; Nancy Waite, PharmD

- OBJECTIVES:** Influenza prevention strategies include immunization of health care workers, yet rates among Canadian health care workers are suboptimal at 31% to 56%. In light of these numbers, this study aimed to estimate the rate of personal influenza vaccination among Ontario pharmacists, a group not previously studied, and to characterize those who received the vaccine.
- METHODS:** A survey was distributed electronically in July 2014 to Ontario-based community pharmacists in the Ontario College of Pharmacists database who agreed to participate in research. Survey questions gathered information on respondents' demographics, practice site and certification to administer immunizations. Multivariate logistic regression was used to correlate these characteristics with personal immunization.
- RESULTS:** Of 4239 eligible pharmacists contacted, 780 completed the survey for a response rate of 18.4%. More than two-thirds of respondents (69%) received the flu vaccine during the 2013-2014 flu season. Pharmacists certified to administer the vaccine were nearly 3 times more likely to have received it versus those not certified (adjusted OR 2.84; 95%CI 1.64 to 4.94, $p < 0.01$). Other demographic and practice site characteristics were not associated with receiving the influenza vaccine.
- CONCLUSIONS:** The pharmacist vaccination rate in Ontario, while higher than most reports of other health care worker vaccination rates, remains suboptimal. However, being certified to administer the vaccine is significantly associated with receiving it. Future research should examine pharmacists' reasons for not receiving the vaccine, with the goal of identifying strategies to improve uptake of influenza vaccination in this population.

Effect of age on Ontario community pharmacy patrons' perspective of pharmacists as influenza immunizers

Wasem Alsabbagh, PhD; Lisa Wenger, PhD; John Papastergiou, BScPhm; Nedzad Pojskic, PhD; Lalitha Raman-Wilms, PharmD; Eric Schneider, PharmD; Nancy Waite, PharmD

OBJECTIVES: To examine the effect of age on attitudes regarding pharmacists as immunizers among pharmacy patrons who have not received the flu vaccine from a pharmacist.

METHODS: A survey was administered to a random sampling of adult patrons at six community pharmacies in the Greater Toronto Area who had not received the flu vaccination from a pharmacist within the past year. The impact of age on survey responses was assessed using simple logistic regression to obtain crude odds ratios (ORs). For this analysis, participants were classified as >65 or < 65 years of age.

RESULTS: Of the 1,004 community pharmacy patrons invited to participate, 541 (58.1%) completed the survey. Those under 65 (n=413, 76.3%) were less likely to receive an annual influenza vaccination (OR 0.28; 95%CI 0.19 to 0.42, p<0.01), including from their family doctor (OR 0.27; 95%CI 0.18 to 0.41, p<0.01). They were also less likely to be aware that pharmacists could administer flu vaccine (OR 0.48; 95% CI 0.29 to 0.77, p<0.01). However, younger participants had a non-significant trend to agree to receive their immunization from pharmacists (OR 1.51; 95% CI 0.99 to 2.3, p=0.05), in spite of fewer visits to pharmacies (At least one visit to pharmacy per week OR 0.45; 95%CI 0.30 to 0.67, p<0.01).

CONCLUSIONS: Among those who have not been recently vaccinated by a pharmacist, younger individuals were less likely to receive the flu vaccine and less aware of pharmacists' availability to provide this service. This represents an interesting target group for marketing of this pharmacist's service.

Pharmacist and pharmacy characteristics associated with being certified to immunize in British Columbia, Canada

Alexandra Fletcher, MSc; Fawziah Marra, PharmD; Gillian Bartlett, PhD; Janusz Kaczorowski, PhD

- OBJECTIVES:** In 2009, pharmacists in British Columbia were given the right to become certified in vaccine-administration. While the uptake of this new activity was quite remarkable, there is still a need to better understand current and expected involvement of pharmacists in immunization activities. Our objective was to identify pharmacist and pharmacy characteristics associated with being certified to immunize.
- METHODS:** The cover letter and the web-link to a 42-item survey was emailed to British Columbia Pharmacy Association (BCPhA) registered pharmacists. Respondents' demographic and practice site characteristics were summarized with descriptive statistics. Multivariate logistic regression was used to examine pharmacist and pharmacy characteristics associated with being certified to administer.
- RESULTS:** The overall survey response rate was 17.2% (663/3847). The current analysis was restricted to community pharmacists (n=551). Overall, 71.3% (393/551) of respondents were certified to administer vaccines. The most commonly provided vaccine was influenza (464 [84.4%]). The majority of pharmacists (445 [80.8%]) were also interested in administering non-vaccine injectables. Pharmacists who had been in practice for fewer years were more likely to be certified. Job position was also related to certification; both managers and owners were more likely than staff to be certified. With respect to pharmacy type, chain and food store pharmacies were both more likely than independent pharmacies to employ certified pharmacists.
- CONCLUSIONS:** The majority of community pharmacists are involved in immunizations and this involvement is associated with specific pharmacist and pharmacy characteristics. This information can be used to better target and encourage more pharmacists to become immunizers.

After the trial ends, now what? A one-year follow-up of the RxING study

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

There is strong evidence that pharmacist care improve patient's glycemic control. However, the sustainability and durability of such interventions beyond the research period is not known. RxING was the first trial of pharmacist prescribing in diabetes, and showed an improvement in A1c of 1.8% over 6 months.

OBJECTIVES: To evaluate glycemic control in the RxING study patients 12 months after the end of the formal study follow-up.

METHODS: We contacted the participating pharmacists to check if the patients who participated in the RxING study are still taking insulin, the dose of insulin, and their A1c. There were no mandated follow up visits with the pharmacist after the study completion.

RESULTS: A total of 100 patients with poorly controlled type 2 diabetes were enrolled in the original RxING study, 93 of those completed the study, while 83 participated in the 12 month follow up. Seventy-five patients were still taking insulin, with the average dose increasing from 31.1 units (SD 18.4) at study completion to 37.4 units (SD 30.8) (95% CI -13.3 - 0.88, $p=0.085$). A1c was reduced from 9.1% (SD 1) at baseline to 7.3% (SD 0.9) at study completion (95% CI 1.4 to 2, $p < 0.001$), and increased to 8.1% (SD 1.3) 12 months later (95% CI -1.1 - -0.5, $p < 0.001$ vs. study completion).

CONCLUSIONS: Twelve months after completing the intervention, approximately half of the glycemic control gains were lost. This highlights the importance of structured follow-up in this patient population.

Evaluation of a refill synchronization program in two community pharmacies

David Blackburn, PharmD; David Tran, BA, MA

OBJECTIVES: Many community pharmacies offer refill synchronization programs to help reduce the logistic burden of obtaining medications on time. Our objective was to evaluate the impact of a refill synchronization program on medication adherence and refill consolidation.

METHODS: Refill records for patients enrolled in a medication synchronization program delivered in two community pharmacies were obtained after removal of all patient identifiers. Follow-up began on the earliest dispensation for up to sixteen eligible medications. Medication adherence over six months was calculated for each medication using the medication possession ratio (MPR). Wherever possible, adherence was also calculated for a six month period preceding enrolment. Finally, a refill consolidation score defined by Choudhry and colleagues was calculated for each eligible drug before and/or after program enrollment.

RESULTS: Refill records between May 2009 and August 2014 were available for 109 participants (35 from Store A and 74 from Store B). The average age of participants was 56 (range 16-96). From the 326 unique drugs used during the six month follow-up period, 306 (94%) were used with optimal adherence (i.e., MPR \geq 80%). In contrast, optimal adherence during a six-month period preceding enrolment was 68% (264/390) for the same drug categories. In addition, the mean refill consolidation score increased from 0.31 to 0.50 ($p < 0.05$).

CONCLUSIONS: Medication adherence and refill consolidation appeared to improve following enrollment in a medication synchronization program. However, the overall number of participants was small and likely a mere fraction of the number of eligible patients in each store.

Eligibility for provincial medication review programs in patients who completed a self-administered risk-categorizing questionnaire

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OBJECTIVES: Most provinces have provincially sponsored programs that reimburse community pharmacies for performing a medication review with a patient. However, the eligibility criteria of these programs vary widely across provinces. The purpose of this study was to determine the proportion of patients deemed “High Risk” and “Low Risk” by the Medication Risk Assessment Questionnaire (MRAQ) who would be eligible to receive a medication review in each Canadian province which offers the service.

METHODS: Adult patients requesting a refill prescription from three community pharmacies in Saskatoon, Saskatchewan completed the MRAQ, which has been previously shown to identify “High Risk” patients who have significantly more drug therapy problems than other patients (“Low Risk”). All patients underwent a comprehensive medication review with a pharmacist. This information was used to determine which patients would have qualified for a medication review in each of the provincial programs. Data was collected from November 2013 to February 2014, and analyzed in March 2014.

RESULTS: Forty-nine patients participated (18 High Risk, 31 Low Risk). The proportion of Low Risk patients eligible for medication reviews ranged from 32.3% to 0%. The proportion of High Risk patients eligible for medication reviews ranged from 100% to 38.9%.

CONCLUSIONS: Many “High Risk” patients would have been excluded from the medication review programs in some provinces, while many “Low Risk” patients would have been eligible for a medication review in others. Eligibility criteria used by the provincial medication review programs in Canada would benefit from re-evaluation to ensure that patients who may benefit the most qualify for these services.

Don't assume health literacy: Medication information for the low health literate population systematic review

Huda Wali, Masters of Pharmacy candidate (MSc); Kelly Grindrod, PharmD, MSc; Zain Hudani, Masters of Pharmacy candidate, BSc

- OBJECTIVES:** To determine what interventions have been targeted towards the low health literate populations regarding improving medication information, as well as their effectiveness in improving medication knowledge and adherence.
- METHODS:** We searched PubMed, Embase, International Pharmaceutical Abstracts (IPA), Web of Science, Cochrane Library, CINAHL, PsycINFO, and Scopus databases from the start of each database to studies published prior to July 7, 2014 and published in only English. Studies were included in this review if they incorporated intervention focused on health literacy and included low health literate populations.
- RESULTS:** We identified 2238 studies from databases and hand searching and included 156 intervention studies. The intervention studies included 15 uncontrolled trial studies, 29 randomized controlled trial studies and 12 nonrandom control trial studies, in which 71% were published in the United States and 88% published between 2005-2014. Using Nvivo we grouped the studies into 6 different types of interventions 1) Written information 2) Visual information 3) Audible/ verbal information 4) Label/ medication bottle 5) Reminder systems 6) Educational programs and workshops. Majority of the interventions in all type 6 groups demonstrated to improve medication knowledge and adherence and very few studies showed no effect.
- CONCLUSIONS:** Health literacy demonstrates to be a barrier to accurately understanding medication information because of the complex language required to comprehend current medication information. Giving attention to this finding suggest that interventions targeted towards the low health literate population display a beneficial tactic to improving patient's knowledge and adherence.

Deprescribing guidelines for the elderly: Preliminary outcomes of a developmental evaluation

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- OBJECTIVES:** Polypharmacy and inappropriate medication use are growing problems. Deprescribing guidelines are a potential solution. However, approaches to developing and implementing such guidelines with primary care and long-term care practitioners have not been described. We aimed to develop and implement three evidence-based deprescribing guidelines, the first of which focused on proton pump inhibitors (PPIs). Our evaluation component provides an understanding of factors associated with successful guideline development, implementation, and uptake.
- METHODS:** Guideline development using AGREE-II (Appraisal of Guidelines for Research and Evaluation), and GRADE (Grading of Recommendations Assessment, Development, and Evaluation) to rating quality of evidence and strength of recommendations. Developmental evaluation using ethnographic methods including: observations and interviews with guideline development and site implementation teams, document analysis and descriptive analysis of guideline uptake and effect.
- RESULTS:** An evidence-based PPI deprescribing guideline was developed. Process components and resulting decision-aid algorithm will be presented. Factors that facilitated successful development included team members' expertise in content and methods, access to additional expertise and resources through professional networks and dedicated staff support to complete work. Deprescribing guideline development processes were modified for implementation with a second guideline. Site implementation experience suggests sites more interested in how to implement deprescribing vs evidence, and that practice site priorities and processes shape ability to respond.
- CONCLUSIONS:** Optimizing a deprescribing guideline development and implementation process aims to facilitate clinicians' ability to reduce inappropriate medication use. Developmental evaluation contributes to improvement of processes used to develop and implement such guidelines.

Impact on practice: Did the ADAPT online patient care skills program make a difference for pharmacists?

Barbara Farrell, BScPhm, PharmD, FCSHP; Douglas Archibald, PhD; Lisa Pizzola, MSc; Natalie Ward, MA, PhD; Ara Cho, BSc; Corey Tsang, BScPhm

OBJECTIVES: To determine if skills and confidence gained through the ADAPT continuing education program have been maintained and translated into adoption of expanded scope of practice activities and billable patient care services, improved quality of patient care and professional growth.

METHODS: Mixed methods approach, employing a survey, complemented with telephone interviews. Study population included Canadian and American pharmacists who had completed the ADAPT program since its inception in 2011. Survey analyzed descriptively and with content analysis of open-ended responses. Interview participants purposively selected from survey responders. Interviews were conducted using a semi-structured approach; audio taped, transcribed and analyzed using a constant comparative approach.

RESULTS: Of the 64 survey respondents, 86% agreed their confidence in ability to competently perform ADAPT skills improved. Respondents agreed they had made changes, and were more efficient and effective in a variety of activities. Three themes emerged from interviews: 1) Knowledge and structure lead to competence which increases confidence, 2) Changes included more systematic and comprehensive approaches, motivation and assertiveness, 3) Impacts included new activities and roles, collaborations, approaches, sense of self, improved care and recognition. Ongoing barriers included owner philosophy, lack of staffing and allocated time, need to change routines. Facilitators included access to regulated technicians, cross-coverage, management support, physical set-up and patient expectations.

CONCLUSIONS: This project demonstrates that a well constructed e-learning program can empower pharmacists to make changes in their practice. ADAPT enables pharmacists to make and maintain changes in their care provision, and increases confidence in their ability to use an expanded scope, but barriers remain.

Key findings from the overview on pharmacist-led interventions to aid deprescribing and optimizing prescribing in the community-based elderly population

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OBJECTIVES: To determine the feasibility, approach, and potential impact of a pharmacist-led “Problem-based MedsCheck” as a consultation to primary care providers interested in strategic deprescribing to alleviate clinical problems encountered by their elderly patients.

METHODS: MEDLINE, EMBASE, and CINAHL were searched from 1990 to 2014 for systematic reviews published in English and including community pharmacist interventions targeting the elderly. Identification and review of qualified publications was performed by two independent researchers. Data was extracted using a structured form and summarized both quantitatively and qualitatively.

RESULTS: 14 full text systematic reviews were identified. The reviews reported mixed effects on the impact of pharmacist-led interventions, with pharmacists more successful at reducing overuse and misuse of medications, compared with underuse. Pharmacist interventions were more likely to have an impact on prescribing and drug use outcomes, with limited evidence to support a significant positive impact on health outcomes. Interventions involving pharmacists that were most likely to demonstrate positive significant effects were: educational outreach, multidisciplinary case conferencing, computerized alert systems, and multi-modal interventions.

CONCLUSIONS: Pharmacist interventions have the greatest impact on prescribing and drug use outcomes signaling that developing a pharmacist-led medication review program aimed at deprescribing is a promising approach. Evidence-informed components for consideration as part of pharmacist care delivered during a “Problem-Based MedsCheck” include: (a) computerized alert system to prompt the pharmacist intervention; (b) pharmacist-led multidisciplinary meetings or educational outreach to review therapeutic topics and provide patient level reports to other health care team members; and (c) multidisciplinary case conferencing to discuss recommendations and care plans.

A descriptive analysis of the Ontario MedsCheck annual pharmacy medication review service

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- OBJECTIVES:** A MedsCheck Annual (MCA) consultation is a medication review service funded by the Ontario government for people taking three or more prescription medications for chronic conditions. The objective of this study was to describe the demographic and clinical characteristics of MCA service recipients.
- METHODS:** This cohort study leverages linked administrative claims data from April 1, 2007 to March 31, 2013 including the Ontario Drug Benefit program data where MCA services are recorded using a Product Identification Number (PIN). Descriptive statistics were calculated for recipient characteristics and stratified by age and sex. Trends over time were examined by plotting the number of services and unique patients by month.
- RESULTS:** The MCA service was provided to 1,498,440 Ontarians (55% seniors, 55% female) over 6 years. One-third of recipients (36%) had two or more MCA over the 6-year period. Service provision increased over time with a sharper increase after 2010. Ten percent of recipients had experienced a hospitalization or emergency department visit 30 days prior to their MCA service; and seven percent had high medication costs in the prior year (\$4000+). Diagnoses of hypertension (68%), COPD or asthma (31%), diabetes (30%), psychiatric condition (28%) and arthritis (27%) were most common. Service recipients over 65 years old were most commonly dispensed an antihypertensive (81%), antilipidemic (64%), or a diuretic drug (49%) in the prior year and received an average of 12 prescription drugs.
- CONCLUSIONS:** Over a 6 year period, approximately one in nine Ontarians has received an MCA, with the majority having cardiovascular disease. Service delivery has increased over time; however, the number of persons receiving the service more than once is low.

Barriers and facilitators to implementing an evaluation framework for pharmacy services

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OBJECTIVES: An Evaluation Framework for Pharmacy Services could foster research to support evidence-based policy and practice. The current study was undertaken to explore and capture stakeholder perspectives on the perceived barriers and facilitators to the development and uptake of a Canadian community-based primary health care pharmacy services evaluation framework. Perspectives on the potential content and structure were also elicited.

METHODS: A general qualitative exploratory design was used. A purposively selected sample of academics, policy makers, physicians and pharmacists from across Canada were invited to participate in a 45-60 minute interview. A thematic analysis approach was used to guide key informant semi-structured interviews and the analytic step of the research process. Data were organized using an iteratively developed codebook. Data analysis focused on emerging themes related to an evaluation framework structure, indicators and outcomes, and barriers and facilitators to its use.

RESULTS: 19 key informants were interviewed: 8 Academics, 7 Policy makers and 4 Practitioners (Pharmacists and Physicians). There were four key barriers revealed to implementation and uptake of an evaluation framework: redundancy, development and process, attitude, and implementation. Five key facilitators were revealed to implementation and uptake of an evaluation framework: knowledge, ease of use, development and process, attitude and motivation.

CONCLUSIONS: The data shows that designing an evaluation framework that can be readily implemented is significantly complex. The identification of perceived barriers and facilitators will aid in designing an evaluation tool so that there can be a deeper understanding of the true impact of pharmacy services and ultimately direct policy and optimize patient care.

Quantitative assessment of community pharmacy culture in Ontario

Dale G.P. Patterson, MBA; Heather K. Patterson, PharmD

OBJECTIVES: Community pharmacy reimbursement for cognitive services (MedsCheck in 2007) and removal of professional allowances (Bill 16 in 2010) were potential enablers of a pharmaceutical-care (PC) cultural paradigm shift. Yet, there is little assessment of presiding culture in Ontario community pharmacy. The Pharmacy Service Orientation (PSO) measure assesses pharmacists' work-site perception along a 1-10 semantic differential scale, derived from the tenets of PC (1 = product-centered care and 10 = patient-centered care). The goal was to use the PSO tool to measure Ontario community pharmacy culture, while concomitantly assessing pharmacy location, type and prescription volume as determinants of PSO.

METHODS: A survey assessing work-site structure and process was sent between August 2013, and March 2014 to pharmacists at randomly identified Ontario community pharmacies. Pharmacists rated PSO and tasks ranging in complexity from technical aspects of dispensing to cognitive aspects of patient-centered care. A PSO score was obtained and determinants of PSO were explored using t-tests.

RESULTS: Mean PSO score from 60 responses was 7.36 + 1.8, with significantly greater PC culture in non-corporate versus corporate work-sites (mean PSO 7.92 and 6.98, respectively; $p < 0.05$). Eighty-three percent of pharmacies reported having patient counseling rooms; 72% had electronic health records; and 15% had a formal quality improvement program. Checking prescriptions and counseling patients were most frequently performed with moderate involvement in Medschecks.

CONCLUSIONS: Despite reporting a high PSO rating, pharmacists' focus presided on checking prescriptions and counseling with moderate penetration of rudimentary PC. Given reported discrepancies, education of pharmacists and amelioration of structural and procedural barriers are warranted to drive patient-centered care.

A structural model of community pharmacists' advanced health care support: A cardiovascular case study

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- OBJECTIVES:** To develop a structural model illustrating the influence of pharmacy/pharmacist characteristics and pharmacists' attitudes on community pharmacists' provision of cardiovascular disease (CVD) support.
- METHODS:** Mail surveys were administered to 1350 randomly selected Australian community pharmacies, stratified by state/territory. Exploratory Factor Analysis (EFA) was performed to investigate the factor structure of attitudinal scales and the Cronbach's alpha coefficient was used to assess the internal consistency. Structural equation modeling was conducted to determine how pharmacists' attitudes and pharmacy/pharmacist characteristics influence CVD support.
- RESULTS:** A response rate of 16% (209/1320) was obtained. EFA of the 20 attitudinal items produced two factors interpreted as: "beliefs about pharmacists' CVD support" and "pharmacists' responsibilities in providing CVD support" ($\alpha=0.836$ and $\alpha=0.768$, respectively). The structural model demonstrated a good fitting model: $\chi^2/df=1.403$, RMSEA=0.047 (90% CI=0.031-0.062), CFI=0.96, TLI=0.96 and WRMR=0.84. The provision of CVD support was directly influenced by "beliefs about pharmacists' CVD support," the frequency of working with GPs, and the number of enhanced pharmacy services; and indirectly influenced by "pharmacists' responsibilities in providing CVD support," documentation, a private area, pharmacy location, and number of pharmacists working. Several variables (including the number of prescriptions dispensed, of dispensary assistants working, of CPD points, and pharmacists' attendance at CVD courses) had weak coefficients.
- CONCLUSIONS:** The study provides evidence that CVD support provision by community pharmacists is influenced by pharmacists' beliefs towards their role in providing advanced support, pharmacists' interactions with GPs, the pharmacy's level of involvement in providing enhanced services, pharmacy infrastructure, and pharmacists' capacity to offer advanced CVD support.

Complexity and vulnerability of multi-medication compliance aids

Certina Ho, RPh, BScPhm, MSt, MEd; Joyce Tsang, BSc, BScPhm; Roger Cheng, RPh, BScPhm, PharmD

- OBJECTIVES:** Traditional processing/dispensing of prescriptions is involved with high-level procedures; compliance packaging introduces further complexity and vulnerability in the pharmacy workflow due to its multi-compartmental design. The objective of this project is to gain a better understanding of the potential contributing factors for compliance-pack related medication incidents.
- METHODS:** An analysis of medication incidents related to compliance pack preparation was performed using reports anonymously submitted to the Institute for Safe Medication Practices Canada (ISMP Canada) Community Pharmacy Incident Reporting (CPhIR) Program from June 2012 to May 2013.
- RESULTS:** A total of 170 incident reports were analyzed. Two main themes were identified: (1) order entry and (2) packaging process. Major concerns with order entry were associated with hospital discharge order, discontinuation of medication from new order, new/prospective update of prescriptions, and miscalculation. Other concerns in regards to packaging process included labeling, incorrect time of administration, half-tablet medications, improper return-to-stock procedures, dose/medication omissions, and incorrect medication/strength. With no permanent physical barriers between each packing slot, compliance packaging is more prone to a medication being misplaced in another slot during the sealing process. Conducting independent double checks is essential in the pharmacy workflow.
- CONCLUSIONS:** Although multi-medication compliance aids may facilitate patient's adherence and improve treatment outcomes, the complexity of the design and procedures for preparation may potentially lead to an increased risk of errors. Recognizing the vulnerabilities of compliance pack preparation creates opportunities for pharmacists to implement additional safeguards to enhance medication safety.

Methotrexate medication incidents in the community

Melody Truong, BScPhm/PharmD candidate; Certina Ho, RPh, BScPhm, MIST, MEd; Roger Cheng, RPh, BScPhm, PharmD

- OBJECTIVES:** Methotrexate is a folate antagonist used in oncologic and non-oncologic indications. Due to a heightened risk of harm when used in error, methotrexate is listed as a high-alert medication in the ISMP List of High Alert Medications in Acute Care Settings. The purpose of this project was to identify common themes, subthemes, and contributing factors related to methotrexate medication incidents within the community. System-based solutions to reduce risk of error were proposed from the findings.
- METHODS:** A qualitative, multi-incident analysis was conducted through the Community Pharmacy Incident Reporting (CPIR) program. Reports of medication incidents involving methotrexate were extracted between April 2010 and August 2014. Of the 161 incidents retrieved, 137 met inclusion criteria and were included in the analysis.
- RESULTS:** A majority of incidents resulted in no error (i.e. near misses), with two resulting in mild harm (i.e., symptoms were mild, temporary and short-term, with no treatment or minor treatment required). The medication incidents were categorized into three themes, including “Associated Medications,” “Dosing Complexities” and “Medication-Use Process”. Each theme was further analyzed into 3 to 4 subthemes (e.g. drug interactions, calculation errors, incorrect route of administration, etc.), respectively, with accompanying potential contributing factors identified.
- CONCLUSIONS:** While methotrexate is used for a number of medical conditions, the repercussions to patient safety may be significant when handled with error. The medication’s unique characteristics may further increase the probability of harm. System-based strategies may aid in reducing the risk of potential harm, and should be actively implemented in the workplace.

COMPASS “Community Pharmacists Advancing Safety in Saskatchewan” continuous quality assurance pilot project

Certina Ho, RPh, BScPhm, MIST, MEd; Marvin Ng, BSc, PharmD candidate; Carol Lee, CHIM; Kelly Ng, BSc, PharmD candidate; Jeannette Sandiford, BPharm, PhD

OBJECTIVES: The COMPASS pilot project is a continuous quality assurance (CQA) program in Saskatchewan, designed to help community pharmacists recognize, resolve, and learn from medication errors. COMPASS allows pharmacists to anonymously report errors, proactively evaluate the safety of their systems, and develop action plans to continually improve their medication-use process.

METHODS: From September 2013 to August 2014, 575 medication incidents were voluntarily reported to ISMP Canada by 10 community pharmacies in Phase I of COMPASS. Quantitative analysis was conducted on all 575 incidents. Qualitative analysis was conducted to approximately 50% of these incidents that were reported with rich narrative information.

RESULTS: Of 575 incidents reported, 84% (482 of 575) were near misses, 15% (88 of 575) caused no patient harm, and 1% (5 of 575) resulted in mild harm to the patient. These incidents were commonly found at the order entry and dispensing stage, with a majority of them related to incorrect quantity of medication. Levothyroxine, estrogen containing products such as oral contraceptives, cardiovascular and psychotropic medications were commonly reported in these incidents. Multi-incident qualitative analysis categorized the incidents into three major themes: “Patient or Caregiver Initiated Medication Safety Enhancements,” “Miscommunication of Drug Orders,” and “Incorrect Drug Product”.

CONCLUSIONS: COMPASS is a CQA pilot project that facilitates anonymous reporting of, and learning from medication incidents. Its main goal is to develop and implement system-based strategies to prevent potential errors from recurring, and ultimately, enhance patient safety. COMPASS is now expanded to Phase II in 2015 with 86 participating community pharmacies in Saskatchewan.

Preventable medication incidents “look-alike/sound-alike drug names”

Certina Ho, RPh, BScPhm, MSt, MEd; Atsushi Kawano, RPh, BSc, MSc, BScPhm; Qi (Kathy) Li, BSc, MSc, PharmD candidate; John Cao, BSc, PharmD candidate; Roger Cheng, RPh, BScPhm, PharmD

OBJECTIVES: Drugs that are look-alike/sound-alike commonly result in medication incidents and may cause severe harm to patients. This is especially pronounced in patients with polypharmacy. The aim of this project is to identify potential contributing factors or causes for these incidents.

METHODS: A qualitative, multi-incident analysis was conducted using anonymous reports submitted to the Institute of Safe Medication Practices Canada (ISMP Canada) Community Pharmacy Incident Reporting (CPhIR) Program. Medication incidents involving “look-alike/sound-alike drug names” from April 2010 to March 2012 were included in the analysis; a total of 342 incidents met inclusion criteria.

RESULTS: The four areas of concern leading to errors were: (1) Individuals - Human capabilities and limitations such as confirmation bias, illegible handwriting and knowledge deficit are main drivers for errors. (2) Environmental - Work environment and workflow processes such as drug storage, environmental distractions, and drug shortage. (3) Technological - Vigilance should be exercised with the use of shortcuts in pharmacy computer systems, such as copying prescriptions. (4) Unique factors that are specific to the look-alike/sound-alike drug pairs such as similar dose, indication, and same ingredients in multiple formulations. Standardized pre-printed order forms and the inclusion of both generic and brand names in pharmacy order entry system should be implemented for system-based improvements.

CONCLUSIONS: The causes of medication incidents from look-alike/sound-alike drug names are multifactorial. It is important for health care professionals to recognize these vulnerabilities within our health care system and actively implement system-based improvements to mitigate the risks.

Development of a framework for podcast creation to supplement pharmacy students' learning

Michael Kani, BSc, MSc, BScPhm; Certina Ho, RPh, BScPhm, MSt, MEd

- OBJECTIVES:** Literature suggests that students perceive podcast as really useful additional resource to supplement their learning rather than as a substitute for the traditional methods of learning. Podcast takes advantage of the ubiquitous devices and networks to allow for “anytime” learning “anywhere”. Currently, the use of podcasts for teaching and learning at the School of Pharmacy is nonexistent. This study intends to develop a framework for podcast creation to supplement pharmacy students learning.
- METHODS:** A needs assessment with 138 pharmacy students indicated that 100% of respondents have access to podcast-capable devices for listening. Although 64% of students do not currently listen or subscribe to podcasts, 77% are very interested or somewhat interested in pharmacy student-related content podcasts.
- RESULTS:** To initiate the creation of podcasts for pharmacy students, a framework was developed that takes into account the necessary steps and elements needed with minimal cost, ease of use, simplicity, and sustainability. This framework engages both faculty and students in knowledge creation for supplemental student learning and incorporates a continuous quality improvement process to ensure the podcast content is evidence-based.
- CONCLUSIONS:** Podcasts may offer pharmacy students the opportunity of supplemental learning through the use of a technology that they already carry, depend on, and is part of their social practice.

Medication incidents involving drug tapering

Amanda Chen, BSc, BScPhm, ACPR, PharmD candidate; Certina Ho, RPh, BScPhm, MSt, MEd; Sharon Liang, BSc, PharmD candidate; Roger Cheng, RPh, BScPhm, PharmD

- OBJECTIVES:** Prescriptions involving a drug tapering process are often complex in nature, involving multiple, sequential doses of medication(s), extensive directions of use, and complex mathematical calculations. All of these considerations illustrate the inherent vulnerability of drug tapering to errors that may occur at any stage of the medication-use process. The objective of this multi-incident analysis was to identify potential systems-based contributing factors and areas of vulnerability towards medication incidents involving drug tapering.
- METHODS:** An analysis of medication incidents involving drug tapering was performed using reports anonymously submitted to the Institute for Safe Medication Practices Canada (ISMP Canada) Community Pharmacy Incident Reporting (CPhIR) Program from 2010 to 2014.
- RESULTS:** 122 medication incidents were analyzed and categorized into four major themes, all of which are potential contributing factors for drug-tapering incidents: (1) lack of standardized tapering guidelines, (2) inadequate patient counseling, (3) operational limitations, and (4) complexity of prescription. The four major themes were further divided into subthemes, some of which included labeling restrictions, billing restrictions, and multi-medication compliance aids.
- CONCLUSIONS:** Errors associated with drug tapering regimens occur on all levels of patient care involving physicians, pharmacists, patients, and caregivers alike. Learning from medication incidents is an imperative step in improving medication-use systems. Pharmacists can mitigate and prevent the likelihood of negative outcomes with the understanding of common themes and contributing factors that may result in drug tapering errors.

An environmental scan of transition courses for pharmacy students prior to advanced pharmacy practice experience rotations

Edric Paw Cho Sing, PharmD candidate; Certina Ho, RPh, BScPhm, MSt, MEd; Annie Lee, RPh, BScPhm, MSc(T)

OBJECTIVES: During the final year of their program, pharmacy students have the opportunity to consolidate their theoretical knowledge and skills through experiential learning in the form of Advanced Pharmacy Practice Experience (APPE) rotations. This study aimed to scan the education literature to identify how pharmacy programs in North America have designed their transition courses to optimize student preparedness and confidence prior to clinical rotations.

METHODS: A comprehensive literature review was conducted on six databases (IPA, Scopus, Embase, Medline, CINAHL, and ERIC). Articles were selected for review based on relevance and with a focus on course content, structure, and impact on measurable outcomes. Refining search terms, conducting ancestry searches, and scoping the curricula of other pharmacy schools through their university-affiliated websites were completed to saturate findings.

RESULTS: Appraisal of the literature involved an evaluation of the target population, setting, study design, and the statistical strength of the evidence. Commonly identified instructional approaches included assessments of learning needs, supplementary reviews of therapeutic topics, peer and near-peer teaching models, hands-on activities, and online modules. Only two studies in the pharmacy literature quantified the impact of a transition course on students' preparedness to clinical rotations.

CONCLUSIONS: The rationale behind the instructional approaches used in existing transition courses have predominantly been extrapolated from education research in other health disciplines. With the expanding landscape of pharmacy practice, it is essential for curriculum development and pharmacists to understand how to best prepare students for their profession. A Canadian model for guiding the development of a transition course is needed.

Patient-perceived usefulness and usability of a smartphone/online application in type 2 diabetes self-management

Corey Tsang, BSc, BScPhm; Qi (Kathy) Li, BSc, MSc, PharmD Candidate; Certina Ho, RPh, BScPhm, MSt, MEd

OBJECTIVES: Few studies have taken a qualitative approach to determine the potential role of smartphone applications or “apps” in self-management of type 2 diabetes (T2DM). This study aimed to evaluate patients’ perceived usefulness and usability of a smartphone/online app “Glucose Buddy” in T2DM self-management.

METHODS: A convenient sample of 6 participants with T2DM was recruited from a family health team clinic. Participants were instructed to use Glucose Buddy on their smartphone or computer. Phone interviews were conducted at 2 and 4 weeks to determine facilitators and barriers of the use of the app, and the impact on patient-perceived diabetes self-management. A qualitative thematic coding approach was used to identify recurring themes.

RESULTS: Participants had varied opinions regarding the perceived usefulness and usability of the app. Some felt that the app helped increase their adherence to glucose monitoring, which led to a greater sense of control over their condition. However, this did not always lead to an increase in other self-management activities such as exercise. The usability of the app also varied among the participants, with “confusion” being identified as a common theme. Lack of intuitive acronyms throughout the app also led to challenges in using and navigating the app.

CONCLUSIONS: The impact of smartphone/online application on T2DM self-management appears to be individualized. The tracking features seem to positively impact certain aspects of disease management (e.g., glucose monitoring) but not others (e.g., exercise). Pharmacists should be aware that it is important to individualize app selection to ensure optimized patient care.

A preliminary model for pharmacists' involvement in the primary care referral process

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- OBJECTIVES:** The potential for medication errors during transitions of care in hospitals has been well documented. Emerging literature demonstrates a similar potential in other transitions of care, such as from family physicians to outpatient specialists. Improving the communication of patients' medication information is one approach to enhance the quality of specialist referrals as cited by a recent national survey of family physicians and specialists. This is a hypothesis-generating study exploring pharmacists' role in communicating accurate and relevant medication information during the referral from primary to specialty care.
- METHODS:** A literature search and poll of two primary care pharmacist listservs were conducted to identify whether such a model had been described, evaluated or was being explored. The investigator group (three pharmacists, one family physician and one endocrinologist), met three times to discuss where pharmacist involvement in the referral process would be desired, and to create and review a preliminary practice model.
- RESULTS:** No literature was found regarding the pharmacists' role in the outpatient referral process. However, medication-related issues include incomplete and potentially outdated medication information, lack of information regarding previous medications tried and unclear monitoring/follow-up plans. A preliminary model was constructed with the pharmacist intervening at time of referral, pre- and post-specialist appointment, in order to address these gaps in care.
- CONCLUSIONS:** There is a role for pharmacists in the referral process to address a newly identified gap in care. Feasibility, workflow and efficacy outcomes will be elucidated in a planned pilot study.

Ordering and interpretation of laboratory values: Development of an education module for Manitoba pharmacy students

Grace Frankel, BScPharm, PharmD; Christopher Louizos, BScPharm, PharmD

- OBJECTIVES:** In 2014, Manitoba pharmacists were granted the ability to order laboratory tests for their patients as an extended scope of practice initiative. To comply with the new provincial pharmacy regulations, an educational component was developed and incorporated into the undergraduate pharmacy curriculum at the University of Manitoba.
- METHODS:** An environmental scan across Canadian pharmacy schools and within the University of Manitoba revealed minimal curricular content devoted to ordering and interpreting lab tests. Learning objectives were created to reflect the Association of Faculties of Pharmacy of Canada (AFPC) educational outcomes. Course content was developed through a variety of sources including textbooks, Diagnostic Services of Manitoba resources, case discussions and practice experience. Course development took place over a 4-month period from May 2014-August 2014 by two faculty members.
- RESULTS:** A module was incorporated into the 2014-2015 academic year in the third-year Pharmacy Skills Lab 3 course. The module consisted of 3 parts; A) seven online didactic lectures conveying foundational knowledge, B) six in-class case-based discussions and C) two in-class multiple-choice quizzes with one take-home case-based assignment for student evaluation. The module accounted for 10% of the final course grade. Preliminary data from student assessment showed excellent overall student performance (class average $94.9\% \pm 3.83\%$) and excellent class participation in case discussions.
- CONCLUSIONS:** Incorporating an education module on ordering and interpreting lab values within a Pharmacy Skills Lab course promotes the advancing scope of practice of pharmacists. Future implications of this work include providing practicing pharmacists with a continuing education opportunity.

Pharmacist contribution to a collaborative policy to improve appropriate laboratory monitoring: Using digoxin as a case study

Ann Thompson, BScPharm, PharmD, ACPR; Cheryl Sadowski, BSc(Pharm), PharmD FCSHP; Don LeGatt, PhD; Yazid Al Hamarneh, BSc (Pharm), PhD, CDM

Digoxin levels in serum or plasma are monitored to ensure the dose being used is safe for patients. It is imperative that samples be collected at the proper time (>6 hours after a dose), yet a report indicates many are not. A policy was implemented by the Therapeutic Drug Monitoring Working Group within our health region to change the administration time of digoxin to 18:00 hours in order to minimize inappropriate collection, which typically occurs in the morning.

OBJECTIVES: To evaluate the policy's impact on the appropriateness of digoxin sample collection time.

METHODS: A retrospective study of inpatients at an acute care institution receiving digoxin before and after policy implementation was conducted. Patients had samples drawn for digoxin level(s) during their stay, with the date and time recorded for both the sample collection and the administration of the last dose. The primary outcome was to evaluate the proportion of correctly drawn samples (defined as ≥ 6 hours after the last dose was administered) before and after policy implementation.

RESULTS: Thirty-eight adult patients in the pre-policy period and 37 in the post-policy period had samples for digoxin levels drawn with 70 and 60 samples evaluated in the pre- and post-policy groups respectively. The percentage of correctly drawn samples improved significantly ($p=0.03$) in the post-policy period (95% versus 82.9%).

CONCLUSIONS: The policy was effective in improving the proportion of appropriately timed samples. Pharmacists have the expertise to address policies aimed at appropriate drug monitoring, which, in turn, can optimize clinical decision-making.

An algorithm for lower urinary tract symptoms adapted for pharmacy practice

Cheryl Sadowski, BSc(Pharm), PharmD, FCSHP; Geraldine Gabriel, BScPharm candidate; Ross Tsuyuki, BSc(Pharm), PharmD, MSc, FCSHP, FACC; Adrian Wagg; Kathleen Hunter; Cara Tannenbaum, MD, MSc

OBJECTIVES: Lower urinary tract symptoms (LUTS) are common and cause significant suffering for patients. Individuals often delay seeking help. Because of the accessibility of pharmacists in the community, they have an opportunity to be able to assess for LUTS and provide care through a specifically designed LUTS guideline. We describe a LUTS guideline adapted for pharmacists.

METHODS: A search was conducted for LUTS guidelines, with relevant guidelines assessed using the AGREE II tool. The guidelines with the highest scores were used to develop the initial draft of the LUTS guideline in combination with established Canadian guidelines. The draft was then reviewed by health care professionals specializing in urology and geriatrics to be assessed for content validity.

RESULTS: We identified a total of 22 relevant LUTS guidelines that were assessed using the AGREE II tool. The guidelines with the highest scoring were published by the National Institute for Health and Care Excellence, and these two guidelines in combination with Canadian guidelines were used to develop our initial draft. The content of the algorithm focuses on initial, safe, screening questions, history-taking, non-pharmacologic interventions, non-prescription modifications, and prescription therapies. Guidance on when to refer to another health professional is included, along with “red flags” for focused reassessment.

CONCLUSIONS: This is the first guideline for the assessment and management of LUTS by community pharmacists. Further work is required to implement an intervention study with this guideline to determine if this will increase early identification and treatment of LUTS patients by community pharmacists.

Development of an assessment tool of accessibility of pharmacy services in serving individuals with disabilities

Cheryl Sadowski, BSc(Pharm), PharmD; Minhas Ali, MEd, BEd, BA; Bev Matthiessen, MBA

- OBJECTIVES:** The purpose of this project is to develop a tool for community pharmacies to assess their ability to provide care for patients with disabilities.
- METHODS:** The Alberta Committee for Citizens with Disabilities (ACCD) received funding to complete an assessment of health services programs across Alberta. One of the health services included is community pharmacies. The ACCD collaborated with individuals in Pharmacy through the Faculty and the Pharmacists' Association of Alberta. Students enrolled in the PHARM 452 Design course participated in the questionnaire development as part of their design assignments. A search was conducted for tools used to assess accessibility. Available questions were reviewed and the collaborators proposed new questions and structuring to support pharmacist-engaged assessment of accessibility.
- RESULTS:** The searches yielded well-established questions and criteria for physical barriers, but few measures for communication, or attitudes toward disability. The collaborators suggested 3 main categories for questions to allow for feedback to the correct staff (e.g., management versus pharmacist), including physical barriers, communication barriers, and attitudinal barriers. The physical barriers focused on access from the parking lot to the counseling rooms, and included physical assessment tools such as access to a moveable blood pressure cuff. The communication barriers included vision and hearing impairment, as well as other forms of supports. The attitudinal barriers related to policies, education, and staff training.
- CONCLUSIONS:** The development of a tool to assess accessibility for community pharmacy services was a collaborative effort between academia, advocacy bodies, health professionals, and students. The tool will be tested in community practice for further validation.

Emerging chronic disease prevention or management programs by community pharmacists: A systematic review

Feng Chang, PharmD; Ayesha Khan, MPH; Kareen Wong, PharmD candidate; Tejal Patel, PharmD

OBJECTIVES: This review aims to build on previous literature, identify and describe recent chronic disease prevention or management programs delivered by community pharmacists.

METHODS: Systematic review of Scopus, PubMed, EMBASE, and International Pharmaceutical Abstracts from January 2009 to April 2014 using PRISMA guidelines. Two independent reviewers assessed papers for inclusion with discrepancies resolved by consensus or a third independent reviewer. English language articles that reported on new community pharmacist services, programs, or models associated with chronic diseases were included. Grey literature was searched using Google. Bibliographies of retrieved articles were manually reviewed for additional articles for inclusion.

RESULTS: We identified 14 articles from peer-reviewed sources plus 6 articles from grey literature. Sixty-five percent (65%) of the articles were from North America. Other articles originated from Australia (20%), Belgium, Ireland, and Thailand (5% each). Programs were implemented for 14 conditions that were prevalent, under-diagnosed, and associated with high health care costs. Main program components included administering screening tools, referral to other providers, health promotion, and creating and implementing care plans. Outcomes were evaluated for 19 programs (95%) including 5 randomized-controlled trials. Results suggested community pharmacists were able to improve clinical and lifestyle outcomes for patients. Programs varied in complexity and design but both pharmacists and patients shared a high level of satisfaction for interventions delivered in a community pharmacy setting. Most studies required a brief training session and were well received by pharmacists.

CONCLUSIONS: Emerging evidence suggests community pharmacists can positively impact patient outcomes through implementing diverse disease prevention or management programs.

Implementation of programs and services by community pharmacists: Barriers, facilitators and operational requirements

Ayesha Khan, MPH; Vincent Vuong, PharmD candidate; Neha Iftikhar, BSc candidate; Tejal Patel, PharmD; Feng Chang, PharmD

- OBJECTIVES:** Community pharmacist practice is evolving towards an emphasis on chronic disease prevention and management. This literature review aims to identify the barriers, facilitators, and operational requirements in the implementation of such new services in a community pharmacy setting.
- METHODS:** Retrospective review of OVID, Embase, Scopus, PubMed and IPA from January 2008 to July 2014. Truncation, Boolean operators, and keyword searching were used to yield relevant resources. Two independent reviewers assessed papers for inclusion with discrepancies resolved by consensus or a third independent reviewer. Bibliographies of retrieved articles were manually reviewed for additional articles for inclusion.
- RESULTS:** A total of 293 articles were retrieved, of which 16 full-text articles were included. These focused on the implementation of disease-specific services (4, 25.0%), core pharmacy services (6, 37.5%), medication review services (4, 25.0%), and electronic tools (2, 12.5%). Pharmacy layout, lack of documentation and lack of time were commonly identified barriers. Facilitators were identified as rapport with physicians and patients, remuneration, patient expectation, manpower/staff, communication/teamwork, external support, program training, readiness, re-evaluation of roles and responsibilities, individual awareness and/or confidence, and understanding of workflow. Discussing errors and enhanced skills training helped increase staff comfort level and satisfaction. Helpful operational requirements included access to a computer, private counseling area, Internet and literature database, and electronic decision-making tools.
- CONCLUSIONS:** Published literature provides insightful advice regarding barriers, facilitators and operational needs that community pharmacists should be familiar with, and apply when implementing innovative services.

Survey of community pharmacists: Knowledge, perceptions and practice related to chronic pain

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- OBJECTIVES:** To conduct an environmental scan of community pharmacists' knowledge, perceptions/attitudes and practice patterns related to chronic low back pain (CLP), painful diabetic neuropathy (PDN) and headache disorders (HD).
- METHODS:** This study was a cross-sectional survey of community pharmacists who were listed in Class A Register of the Ontario College of Pharmacists and had expressed an interest in participating in research. Pharmacists were emailed an invitation with a web link to participate in the survey. Participants were asked to respond to questions assessing knowledge, attitudes/perceptions, practice patterns and self-efficacy as related to CLP, PDN, HD and opioids. Demographic data was also collected.
- RESULTS:** The overall response rate was 11%. Respondents were primarily female, between the ages of 41 and 60 years, had >20 years of practice in Canada, worked 25-40 hours/week and in a metropolitan location. The majority of pharmacists report that up to 25% of their patients had CLP, PDN or HD and felt comfortable when approached by patients with these conditions. Accurate responses ranged from 43-95% for questions on knowledge of CLP, PDN and HD; only 22% of the respondents listed the correct "watchful daily dose" for opioids.
- CONCLUSIONS:** Patients with chronic pain commonly present to community pharmacies. Pharmacists have the opportunity to provide meaningful care for these patients. However, gaps in knowledge exist and can be a barrier.

Feasibility and process of using a drug-related problem classification tool in Belgian community pharmacy daily practice

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- OBJECTIVES:** An adapted Pharmaceutical Care Network Europe (PCNE) drug-related problem (DRP) classification tool has been developed for the Belgian community pharmacies. The aims were to 1) assess daily practice feasibility of using the PCNE classification tool; 2) describe the perception, facilitators and barriers of pharmacy students regarding the tool used.
- METHODS:** This study involved Belgian pharmacy students and their community pharmacist supervisors. The supervisors were invited to identify the DRPs and pharmacy students were responsible for recording the results of their assessment. Thereafter, students completed a web-based self-administered questionnaire about the tool including three sections; 1) The verification applied to new prescriptions and renewals; 2) The need to consult complementary information sources for DRP detection. 3) Comments on barriers and facilitators to the tool usage.
- RESULTS:** Most respondents reported applying the same verification steps. Overall, 54% and 75% of students reported the need to consult complementary information to apply the PCNE tool to unknown and known patients to the pharmacy, respectively; as well as information from scientific sources, which were mainly Belgian publications (96%). Finally, 84% of students thought that DRP detection could promote the profession to patients and practitioners, 91% of them thought that it can strengthen the pharmacist-patient relationship. The lack of time seems to be the major barrier to the use of this tool in daily practice (79%).
- CONCLUSIONS:** Among community pharmacists, the lack of time was perceived as a major barrier to its use in current practice. It requires the need to consult pharmacy charts.

A pilot project using a falls risk assessment tool during home medication reviews

Karen Riley, BScPhm, PharmD, BCPS, CGP, BCACP, CDE

OBJECTIVES: To trial a tool that identifies the risk of patients falling during home medication reviews and to identify patients who would benefit from more frequent follow-up based on the falls risk assessment.

METHODS: From May 2014 to November 2014, the Falls Risk Assessment Instrument was used to determine the risk of falls during home MedsCheck in 27 community patients.

RESULTS: The total number of patients in this evaluation was 27. The average age of the patient was 80.33. Seventy-four percent of the patients were female. The average number of medications per patient was as follows: 9.04 prescription medications, 3.48 OTC medications with a total of 11.11 medications. Twenty-two percent of patients had diabetes and 85 percent had cardiovascular disease. Patients were referred for a home visit by the community pharmacy, through Community Care Access home care services or through a memory clinic referral.

Based on the results, patients were taking on average 4.22 medications that could lead to falls (63% of patients were taking 4 to 7 medications and 37% of patients were taking 1 to 3 medications). Eighty-eight percent of patients were in the high-risk category for falls based on the Falls Risk Assessment Instrument.

CONCLUSIONS: Based on the high percent of patients receiving a high risk score on the Falls Risk Assessment, 88% of these patients would benefit from re-evaluation of their scores after 6 months of having the first risk assessment.

The role of the pharmacist in educating patients about environmental falls risks during home visits

Karen Riley, BScPhm, PharmD, BCPS, CGP, BCACP, CDE

OBJECTIVES: To identify and educate patients about the role of environmental risk factors during home medication reviews using a Falls Prevention Checklist from the Minnesota Safety Council.

METHODS: From May 2014 to November 2014, 27 patients seen by a pharmacist in their home for medication reviews were asked to participate in a review of issues that could lead to falls in their home. Using the Falls Prevention Checklist from the Minnesota Safety Council, entitled “What you can do To prevent Falls,” the pharmacist reviewed with the patient the various items on the checklist. At the end of the review, the pharmacist discussed the findings with the patient and family and left a copy of the tool with the patient to keep with the recommendations.

RESULTS: Based on the Falls Prevention Checklist, the average number of recommendations was tabulated per patient. The average total number of recommendations was 13.33 per patient. The highest number of recommendations was for personal risk factors (6.67/patient) followed by bedroom (2.18), bathroom (1.66), living area (1.11), kitchen (0.85) and stairs and steps (0.70).

From this pilot project, the pharmacist was able to make on an average of 13.33 recommendations per patient with half of them being related to personal risk factors.

CONCLUSIONS: In addition to medication and disease state risks recommendations to reduce the risk of falls, pharmacists can also help identify additional environmental risks for falls for patients during home visits and make recommendations to patients to prevent falls.

A pilot project to compare the results of various tools to identify inappropriate medications and medications that increase the risk of falls in patients during home medication reviews

Karen Riley, BScPhm, PharmD, BCPS, CGP, BCACP, CDE

OBJECTIVES: To review the number of inappropriate medications in an elderly home visit patient population using the Beers, Anticholinergic Cognitive Burden List, the Falls Risk Assessment Instrument, STOPP, and Frids criteria and to make recommendations for drug therapy using these criteria.

METHODS: From May 2014 to November 2014, 27 patients were seen by a pharmacist in their home for medication reviews. Medications were categorized based on above criteria, drug-related problems were identified and physicians were contacted to review recommendations based on the problems identified.

RESULTS: The average number of high-risk drugs per patient based on the screening tools are listed. The FRIDS score identified 4.74 high risk medications followed by the 4.22 from the Falls Risk Assessment Instrument, 3.22 with ACB score, 2.74 with STOPP criteria and 1.93 with the BEERS criteria.

Of the drug-related problems, 52% were ADRs, 18% of medications were not indicated, 8.43% the dose was too low, 8.43% the dose was too high and 13% of patients were not adherent to their medications.

A total of 83 recommendations were made: 4.8% start new drug, 19% change drug, 6% increase dose, 14% decrease dose, 54% stop drug, 1.2% monitor patient.

Eighty-eight percent of all of the recommendations for the drug-related problems were accepted.

CONCLUSIONS: In this patient population, using the FRIDS medication list identified the highest number of medications increasing patient risk compared to the other available tools that indicate inappropriate medication use. There was an 88% acceptance of recommendations related to high-risk medications.

Development of a guidebook for pharmacists on diabetes management

Lori MacCallum, BScPhm, PharmD

OBJECTIVES: Develop a comprehensive and easy-to use resource for community pharmacists in diabetes management.

METHODS: Starting with Canadian clinical practice guidelines in diabetes, hypertension and dyslipidemia, recommendations were identified that are most relevant to pharmacists. Experts, primarily pharmacists, developed content based on these recommendations, supplementing it with additional information pharmacists need to know to implement these recommendations. To ensure usability, representatives from 3 community pharmacies reviewed the draft content and tested it in their pharmacies with their staff. Feedback was then provided on the relevance, ease of use and completeness of the content. Using an iterative design approach, the content was continually revised over a 6 month period until it met the needs of the end-user. Information architecture and layout were completed with the assistance of a user-experience designer. A second set of experts, primarily physicians, reviewed the final content for accuracy.

RESULTS: A Guidebook for Pharmacists on Diabetes Management is based on Canadian clinical practice guidelines. The information has been tailored to the needs of pharmacists by distilling down to the most relevant recommendations and supplementing with information that is not found in the guidelines and supports the implementation of these recommendations in daily practice.

CONCLUSIONS: Involving the end-user, the community pharmacist, in the development process and understanding the context in which it will be used, the busy community pharmacy, the Guidebook is a resource that is comprehensive, easy to use and tailored to the needs of pharmacists as they care for diabetes patients.

Confronting inequities: A review of the literature on pharmacist practice and health care disparities

Lisa Wenger, PhD; Jane Pearson-Sharpe, BA; Meagen Rosenthal, PhD; Nancy Waite, BScPhm, PharmD

Disparities in the provision of health care to traditionally marginalized populations have been documented in other health professions. As pharmacists' scope of practice increases, an improved understanding of pharmacists' perceptions of these populations is needed. To ensure that pharmacists' accessibility is as cognitively developed as it is spatially distributed, we conducted a scoping review of literature examining inequities in pharmacist care, including links with broader health disparities.

OBJECTIVES: To provide an overview of the literature, draw conclusions, identify gaps, and make recommendations, for future research into this topic area.

METHODS: Following Arksey and O'Malley's scoping review framework, search terms were applied to five health-sciences and pharmacy-specific database (PubMed, CINAHL, Embase, IPA, Scopus) and several grey literature databases. After systematic screening, 93 peer-reviewed and 23 grey literature articles were included.

RESULTS: Organized around core concepts (stigma, bias, disparities), extant research examining pharmacist-related dynamics in health disparities has considered pharmacists' care for those who use injection drugs, have mental illness, have limited literacy or English proficiency, and racialized groups. Although many pharmacists are providing concordant care, findings indicate deficits in pharmacists' knowledge about marginalized groups, biased, stereotypical and stigmatizing perceptions, and constrained service provision. These patterns align with those observed in health care practice, more generally.

CONCLUSIONS: This literature evidences the importance of considering and addressing patterns in pharmacists' practice with marginalized populations, particularly as pharmacist scope of practice expands. Among next steps are opportunities to expand populations considered, examine within-group differences, and attend to implicit (as well as explicit) bias.

Prescriber barriers and enablers to minimising potentially inappropriate medications in adults: A systematic review and thematic synthesis

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OBJECTIVES: To synthesise qualitative studies that explore prescribers' perceived barriers and enablers to minimising potentially inappropriate medications (PIMs) chronically prescribed in adults.

METHODS: A qualitative systematic review was undertaken. A quality checklist was used to assess the transparency of the reporting of included studies and the potential for bias. Thematic synthesis identified common subthemes and descriptive themes across studies from which an analytical construct was developed. Study characteristics were examined to explain differences in findings.

Participants: Medical and non-medical prescribers of medicines to adults.

Outcomes: Prescribers' perspectives on factors which shape their behaviour towards continuing or discontinuing PIMs in adults.

RESULTS: 21 studies were included; most explored primary care physicians' perspectives on managing older, community-based adults. Barriers and enablers to minimising PIMs emerged within four analytical themes: problem awareness; inertia secondary to lower perceived value proposition for ceasing versus continuing PIMs; self-efficacy in regard to personal ability to alter prescribing; and feasibility of altering prescribing in routine care environments given external constraints. The first three themes are intrinsic to the prescriber (eg, beliefs, attitudes, knowledge, skills, behaviour) and the fourth is extrinsic (eg, patient, work setting, health system and cultural factors). The PIMs examined and practice setting influenced the themes reported.

CONCLUSIONS: A multitude of highly interdependent factors shape prescribers' behaviour towards continuing or discontinuing PIMs. A full understanding of prescriber barriers and enablers to changing prescribing behaviour is critical to the development of targeted interventions aimed at deprescribing PIMs and reducing the risk of iatrogenic harm.

Community pharmacy retrospective survey on effectiveness and tolerance of varenicline as a smoking cessation agent

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- OBJECTIVES:** To determine the long term success rate of varenicline (Champix®) as a smoking cessation agent and the reasons behind cases of failure among the patients who received Champix from a community pharmacy.
- METHODS:** A single centre, retrospective, telephone survey was conducted by two independent investigators who were not involved in the initiation nor continuation of varenicline therapy. Participants were included if they received a prescription for varenicline starter pack between January 2012 and February 2014 from the one community pharmacy. The survey contained questions regarding completion status of the varenicline course, reasons for early termination, whether participants restarted smoking and reasons for restarting smoking. Participants who failed therapy were also asked if they are interested in reattempting smoking cessation and if they wished to receive future prescriptions for smoking cessation agents from their family physician or pharmacists.
- RESULTS:** A total of 22 patients completed the survey. Only 36.4% successfully quit and have not returned to smoking. The percentage of patients who returned to smoking was 63.6%. Only 31.8% completed the full course of varenicline therapy. Reasons quoted for early termination included: adverse reactions from varenicline use, cost of medication, continued cravings, felt the medication was no longer necessary, and was not ready to quit smoking yet. Many who stopped varenicline early returned to smoking due to cravings. Abnormal, vivid dreams was the most commonly experienced adverse reaction, however, those who discontinued varenicline use reported nausea and stomach upset as the main reason. Of the patients who wished to reattempt smoking cessation, they reported the desire to receive future consultations from pharmacists.
- CONCLUSIONS:** The early results of the study suggest that varenicline therapy is often terminated early due to a myriad of reasons. Community pharmacists have a role in monitoring compliance, tolerance, and providing support for patients attempting to quit smoking. The best time to follow-up with patients cannot be determined through this survey however the reasons quoted for returning to smoking demonstrate that there may be a role for pharmacists to follow up and aid in alleviating nicotine cravings.

Medication reconciliation interventions in ambulatory care: A scoping review

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- OBJECTIVES:** Patients receiving care in ambulatory settings have significant risk factors for adverse drug events (ADEs). Medication reconciliation (MR) has been shown to reduce ADEs in institutional settings; however, its impact is unclear in ambulatory care. This project described and categorized studies of MR interventions in ambulatory care in terms of study designs, elements of interventions, outcomes examined, and implementation facilitators/barriers.
- METHODS:** MEDLINE, CINAHL, EMBASE, IPA from inception to April 2014; grey literature and reference lists of included publications were searched. English-language comparative studies of MR interventions in adults receiving care in ambulatory settings were included. Interventions were categorized based on the Cochrane Effective Practice and Organization of Care (EPOC) framework. Categories for outcomes and facilitator/barriers were developed and tested by authors.
- RESULTS:** Fourteen publications were included: 10 before-and-after studies, three cohort studies, and one randomized controlled trial. Interventions were focused in two of four EPOC categories: 1) professional (predominantly educational outreach visits and patient reminders); 2) organizational (predominantly provider oriented); there were no financial or regulatory interventions. Eleven studies reported process outcomes with correctness being the most common. Four studies examined health care utilization, and one study assessed mortality. Eight studies discussed implementation facilitators, and four studies discussed barriers, which included factors at the patient, staff, and clinic levels.
- CONCLUSIONS:** The majority of MR interventions in ambulatory care involve professional interventions, and outcomes examined are mainly process focused. Foci for future research include the clinical significance of professional interventions and the impact of organizational, financial and regulatory interventions.

Hypertension treatment and control in the community: A novel program of surveillance for hypertension in a grocery-pharmacy setting

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OBJECTIVES: Undiagnosed, untreated, and undertreated hypertension remains a significant public health burden. We need ongoing community-based methods of surveillance. Pharmacies located in grocery stores are visited frequently by the public, and represent a unique opportunity for blood pressure (BP) screening and awareness activities.

METHODS: We conducted BP consultations in 470 Loblaw/Drugstore pharmacies across Canada from February 2013 to February 2014. In-store signs and newspaper ads offered individuals the opportunity to have a blood pressure (BP) consultation from a pharmacist. Blood pressure measurements were performed using the well-validated PharmaSmart PS2000 kiosk, and followed Canadian Hypertension Education Program (CHEP)-recommended procedures for BP measurement. All patients received feedback and recommendations based on their results as well as educational material endorsed by Hypertension Canada. Significantly elevated BP results were communicated to the subject's family physician according to a standardized protocol.

RESULTS: We assessed 53,027 individuals (average age 59 (SD 16.9) years, 51% female). Average BP was 133 (SD 16.6)/77.9 (SD 11.4) mmHg, heart rate was 76.2 (SD 12.9) beats/minute. A total of 52% reported taking antihypertensive medications in the past month and 18.4% had diabetes. In those 43,552 subjects without diabetes, 42% achieved the BP target of <140/90 mmHg. In the 9475 subjects with diabetes, 16.5% achieved the BP target of <130/80 mmHg.

CONCLUSIONS: In this ongoing screening program, we screened over 50,000 community-dwelling adults. BP treatment and control in 2013-2014 is no better than that reported in Ontario in 2006 and the National Population Health Survey from 2007-2009. Indeed, 58% and 84% of subjects without and with diabetes, respectively, were above recommended BP levels. Pharmacy-based interventions through major pharmacy chains offer a novel approach in the assessment and implementation of new management approaches in the treatment of hypertension.

Development and validation of the Severity Categorization for Pharmaceutical Evaluation (SCOPE) criteria to evaluate drug-related problems in chronic kidney disease

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OBJECTIVES: The prevalence of drug-related problems (DRPs) in chronic kidney disease (CKD) patients is known to be high. However, information about their severity remains scarce. Therefore, the objective of this project is to develop and validate the Severity Categorization for Pharmaceutical Evaluation (SCOPE) criteria to evaluate the severity of DRPs in CKD patients from a community pharmacy perspective.

METHODS: The criteria were adapted from an existing tool and considered interventions required to manage DRPs in community pharmacy. Ten community pharmacists reviewed the criteria. An expert panel involving community pharmacists (n=4), hospital pharmacists (n=4), family physicians (n=2), and nephrologists (n=2) scored the relevance of each criteria. The severity of 487 DRPs identified among 168 patients was rated independently by two evaluators and by one evaluator on two occasions. Kappa reliability coefficients were computed. Severity as assessed by implicit judgment and the SCOPE criteria were compared.

RESULTS: Three severity categories were defined (mild, moderate and severe), each including two levels (for a total of six levels). At each level, specific interventions required to manage DRPs in community pharmacy were listed. Test-retest reliability coefficient by level was 0.85 (95% Confidence interval: 0.79 to 0.90), and inter-rater reliability coefficient was 0.77 (0.72 to 0.82). Test-retest coefficient by category was 0.89 (0.84 to 0.95), and inter-rater coefficient was 0.90 (0.86 to 0.94). Higher level of SCOPE severity was associated with more severe DRP as rated by implicit judgment ($p < 0.05$).

CONCLUSIONS: SCOPE criteria constitute an innovative research tool to evaluate the severity of DRPs in community pharmacy. The criteria are reliable and are correlated with clinical implicit judgment.

Pharmacist and physician preferences for medication management delivery

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- OBJECTIVES:** As medication management (MM) services roll out throughout Canada as part of expanded scope of practice legislation in all provinces, little is known about the preferences of pharmacists and physicians around MM. As such, the objective of this study was to quantitatively characterize the preferences of pharmacists and physicians using a choice experiment about MM.
- METHODS:** Choice experiments are widely used attribute-based survey techniques for measuring preferences in health economics. Based on outcomes of focus groups, we designed a survey of 14 attribute levels related to MM delivery. Using a best/worst scaling (BWS) choice experiment, the relative importance of these attributes were determined for both pharmacists and physicians. Conditional logit modeling of BWS data allowed the estimation of preference weights for each attribute.
- RESULTS:** 119 pharmacists and 146 physicians completed the questionnaire. The majority of pharmacists were female, had only a baccalaureate degree, and were staff members. Of the physician respondents, 70% were male and 95% were family practitioners licensed for an average of 25 years. With respect to MM, both pharmacist's and physician's strongest preferences were for improved patient health and/or medication use. However, for the least preferred attribute, for physicians it was worsening of physician-patient relationships while for pharmacists, it was worsening of patient health or medication use.
- CONCLUSIONS:** Pharmacists and physicians have preferences around MM attributes. Coming up with MM strategies that maximize these preferences will help ensure success.

Perceptions, preferences, and willingness-to-pay of British Columbia residents for medication management services provided by pharmacists

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- OBJECTIVES:** Across Canada, pharmacists have expanded their scope of practice by performing medication management (MM) services. We conducted a province-wide survey of BC residents to investigate the general public's utilization, satisfaction, and willingness to pay for MM services provided by pharmacists.
- METHODS:** A cross-sectional online survey including a best-worst scaling task was designed to understand the general public's opinions, preferences, and willingness-to-pay with respect to MM services in British Columbia.
- RESULTS:** A total of 819 individuals of 977 contacted responded to the questionnaire (84% response rate). The mean age was 45 years and 37% were female. Overall, 93% of respondents felt that the medication advice from their pharmacist resulted in improvement in patient outcomes and/or medication use. This was also selected as the "best" attribute of MM, other preferred attributes of MM included being able to obtain an appointment with the pharmacist on the same day or via walk-in, improved patient-physician relationships, and if MM sessions could be completed in 15 minutes with the pharmacist. The average willingness to pay for MM was \$24.55 (SD \$21.44). Younger males with higher household income were more likely to be willing to pay more for MM services out of pocket.
- CONCLUSIONS:** Respondents highly valued the accessibility of pharmacists. Respondents stated overall support for MM services and recognized the potential of pharmacist involvement in drug therapy management to improve patient outcomes and medication use. However, there is a gap between what patients are willing to pay and government expenditure on these services, which may warrant further investigation into alternative payment models.

BC medication management project: Perspectives of pharmacists, patients

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Larry Lynd, BSP, PhD; Carlo Marra, PharmD, PhD*

- OBJECTIVES:** The BC Medication Management Project (BCMMP) was developed by the BC Ministry of Health and the BC Pharmacy Association. This pilot project ran from September 2010 to January 2012. Pharmacists reviewed patients' medication histories, discussed best use of medications, provided education and monitored for adverse effects, developed a plan to deal with medication issues and created a best possible medication history.
- METHODS:** To evaluate the experience of participating in BCMMP, challenges and strengths of the project and the alignment of these experiences with the overarching goals, focus groups and interviews were conducted with 6 stakeholder groups. Themes were compared within and across stakeholder type and descriptively analyzed.
- RESULTS:** A total of 88 people participated in the focus groups/interviews. Pharmacists stated that providing BCMMP services was professionally satisfying and concurred with patients that the service did benefit them. However, participating in BCMMP was not seen as financially sustainable by pharmacy owners and there were concerns about patient selection. Physicians expressed concerns about increased workload associated with BCMMP, for which they were not compensated. The computer system and burden of documentation were identified as the greatest problems.
- CONCLUSIONS:** The BCMMP pilot project was enthusiastically received by pharmacists and patients who felt that it benefited patients and moved the pharmacy profession in a positive direction. It was widely felt that BCMMP could be successful and sustainable if the identified challenges are addressed.

Identifying heavy health care users among primary care patients with chronic non-cancer pain

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OBJECTIVES: To identify predictors of high direct health care costs among patients with chronic non-cancer pain (CNCP) followed in primary care.

METHODS: Patients reporting CNCP, with an active painkiller prescription from a family physician and covered by the Régie d'assurance Maladie du Québec (RAMQ) insurance were selected. They completed questionnaires about their socio-demographic, psychosocial and clinical characteristics. Direct health care costs for the year preceding and following recruitment included prescribed pain medications, outpatient services, pain related hospitalizations and emergency room (ER) admissions. Health care costs were documented using the administrative database. Patients' characteristics were compared between patients in most expensive annual health care costs quartile following recruitment and the rest of patients. A logistic regression using the Akaike information criterion was used to identify predictors of high health care costs. Odds ratios were calculated for variables included in the final model.

RESULTS: Patients (n=302) mean annual direct health care costs were \$4,315 (\$7,031). The costs were mainly related to prescribed pain medications (60%). High costs in the year following recruitment were predicted by previous prescribed pain medications costs (OR =11.5, 95% CI=6.14-21.5). Higher Brief Pain Inventory score (OR=1.24, 95% CI=1.04-1.47), Charlson Comorbidity Index (OR=1.28, 95% CI=1.10-1.53) and pain in the lower body (OR=2.12, 95% CI=1.01-4.42) predicted higher CNCP health care costs.

CONCLUSIONS: Patients with high pain medication costs during the previous year, suffering from pain related disability, comorbidities and low body pain are prone to have high health care costs during the following year.

Off-label use of medications at the Centre hospitalier universitaire Yalgado Ouedraogo (CHUYO), Burkina Faso

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The use of medications in hospitals has not always been in agreement with the conditions defined in the monograph approved by marketing authorization.

OBJECTIVES: To determine the rate of off-label prescriptions at the CHUYO, describe the administration of the medications prescribed and identify potential therapeutic risks.

METHODS: A review of patient files from October 1 to December 31, 2011, in clinical services was conducted to collect information on the medications, diagnosis, treatment plan, prescribing physician's qualifications, as well as the patient's age, sex, and history. The observed conditions of use were compared to the monograph. The motivation for off-label use was established during an interview with one prescribing physician for each service.

RESULTS: Among the 11,918 prescriptions reviewed, 360 off-label prescriptions were found, including 86.9% in the pediatrics department and 57% involving infants. Off-label use focused on age (ex.: cefixime suspension, children <6 months, risk of over or underdose), the route of administration (ex.: injectable clavulanic acid/amoxicillin, by nebulization), the indication (ex.: alfuzosin for lithiasis of the lower ureter), the route of administration and the indication (ex.: misoprostol oral tablet used vaginally to soften the cervix, risk of fetal heart defect). The absence of an alternative treatment was the main justification for usage.

CONCLUSIONS: Off-label prescriptions are used at CHUYO and are more significant in pediatrics. The potential risks in therapeutic practice suggest the implementation of a monitoring log for this type of prescription.

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