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Poster Abstracts

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PHARMACY EDUCATION

PE01

Evaluation of internet-based multiple-mini interviews (iMMI) compared to traditional onsite interviews (MMI) for the PharmD for Pharmacists.

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Background: The *PharmD for Pharmacists* is an online, non-traditional Doctor of Pharmacy (PharmD) program. It uses multiple-mini interviews (MMIs) as part of its admissions. In 2014, internet-based MMI (iMMI) via Skype® was provided as an option to improve the applicants' experience, decrease costs, and to align with our mandate of distant education. Applicants self-select their preferred interview delivery.

Objective: Assess if applicants selecting iMMI have the same probability for admission as those completing in-person MMIs

Methods: We conducted a retrospective cohort study of applicants between 2014 and 2017. The primary outcome was successful acceptance to the program. We examined baseline characteristics between groups. Differences were tested using chi-square, paired t-tests, and the Krusukal Wallis tests depending on variables types. We fit a logistic regression to model the probability of successful admission and reported the Odds Ratios (OR) with 95% confidence intervals. Models were controlled for: pre-interview score, undergraduate pharmacy location, current practice setting, and years since graduation.

Results: We analyzed 238 interviewees (n=116 iMMI, n=122 MMI). The only significant differences between the groups were distance from campus ($p<0.001$) and pre-interview scores (iMMI 5.3 and MMI 4.9 ($p=0.03$)). We found no difference (OR 1.2 (0.5 – 2.8)) in the proportion of applicants admitted between groups, with 84.5% for iMMI and 79.5% for MMI admitted.

Conclusions: iMMIs had similar probability of admission compared to MMIs. Potential applicants and university programs should be confident in using iMMI as an option for admission interviews. Further work needs to be completed on the interviewee's experience with iMMI and the predictive ability of the admission process in applicants' success.

PHARMACY EDUCATION

PE02

Bachelor of Science in Pharmacy Student Perceptions of the Entry-Level Doctor of Pharmacy Degree: A Qualitative Study

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Background: Most Canadian schools of pharmacy are undergoing a credential shift from a baccalaureate degree to an entry-level Doctor of Pharmacy (ELPD). Little is known about how Bachelor of Science in Pharmacy (BSP or equivalent) students perceive this transition.

Methods: All students in the BSP program at the University of Saskatchewan during the 2017-18 academic year were eligible to participate. Students were randomly assigned a number based on their year in the program, and eight participants were selected from each year (Year 2 to 4) by a third party using a table of random numbers. Face to face interviews were conducted by a research assistant, using a semi-structured interview guide to characterize students' perceptions of the PharmD program. Interviews were audiotaped and transcribed verbatim. Thematic analysis was performed using NVivo qualitative analysis software.

Results: Twenty-four interviews were conducted during the months of September through November, 2017, lasting a mean of 15 minutes. Students' opinions on the impact of the implementation of the PharmD program varied, and six themes emerged from the interviews: positive academic and social experiences, perceptions of the PharmD program, insecurities of BSP students, impact on future employment, mixed plans to pursue a post- baccalaureate PharmD, and suggestions for improvement. Participants were primarily concerned about PharmD graduates being preferentially hired for hospital pharmacy jobs (n=20), and claimed this as a common motivator for pursuing a post-baccalaureate PharmD. Some participants indicated that they were not that worried in securing employment as they felt experience would be more valuable than a degree, however these students were in the later years of their program as opposed to the second year students who are only 1 year removed from the PharmD program.

Conclusion: Increased dialogue between Canadian pharmacy faculties and students is necessary to provide reassurance to baccalaureate students, so that the credential shift to a PharmD does not deter their desire to work in a specific practice setting.

PHARMACY EDUCATION

PE03

From Participant to Peer Facilitator: Evaluating the Experience of a Peer-Led Pharmacy Skills Lab

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Objective: To evaluate peer-led pharmacy skills labs in the Medication Therapy Management 3 (MTM3) course for Year 2 PharmD students. Students enrolled in the Teaching and Learning (TL) elective course were peer facilitators (PFs) for the skills labs.

Methods: In the TL elective course, third year students learned principles of facilitation, feedback and assessment which were applied in their role as peer facilitators (PFs) in the Year 2 MTM3 practice labs. The three practice labs focused on skills development in patient interactions and obtaining the best possible medication history. Upon completion, the peer facilitators (PFs) and the MTM3 students completed an online survey examining satisfaction, transferability of experience, and quality of experience. Quantitative data was reported as frequency distributions and the accrued qualitative comments were coded to key phrases for thematic analysis.

Results: In total, 11 (46%) PFs and 13 (25%) MTM3 students completed the online survey. Eighty-four percent of MTM3 student respondents felts that PF feedback was specific and all PF respondents agreed that the labs met the TL course objectives. All PF respondents and 84.6% of MTM3 student respondents indicated 'agree' or 'strongly agree' in recommending the activity to future students. Also, 63.6% of PF respondents rated 'agree' or 'strongly agree' that lab facilitation skills were transferable to future experiential work placements, despite limited opportunities to use skills in all settings. Thematically, both groups derived benefit from the sessions, utilized sessions as a medium for skills transfer and experienced a safe and open learning environment.

Conclusions: Peer-led practice labs were well received by both PFs and MTM3 students. These practice labs may serve as a conduit for skills transfer and are strengthened by supportive environmental factors. For future improvements, PFs may benefit from additional training in delivering feedback and MTM3 students would appreciate increased opportunities to participate.

PHARMACY EDUCATION

PE04

Development, Implementation, and Evaluation of a Medication Adherence Simulation Activity within Program Year 1 of an Entry-to-Practice PharmD Program

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Background: As the scope of practice for Canadian pharmacists expands to include medication prescribing, there is greater urgency for Canadian pharmacy schools to provide education in medication adherence. To ensure students are well-equipped to address adherence issues during clerkships, all Program Year 1 (PY1) students in UBC's Entry-to-Practice (E2P) PharmD program engaged in an authentic adherence activity. Beginning in January 2018, students newly diagnosed with a severe lactose deficiency were asked to follow a two-week medication regimen.

Objective: To describe the development, implementation and evaluation of a medication adherence activity for PY1 E2P PharmD students.

Methods: A two-week supply of lactose-filled capsules was prepared for 215 students enrolled in PY1 of the E2P PharmD program. Each vial was labeled with the individual student's name and directions reading, "Take one capsule twice a day for the rest of your life." Students were advised of their diagnosis and asked to start their treatment immediately. Two weeks later, students discussed their experiences with a facilitator and provided a pill count. A post-activity written reflection was assigned as part of their annual portfolio.

Results: The pill count survey had 173/215 respondents, of which 51.45% achieved 80% adherence. Benefits to the students include gaining a better appreciation and empathy for the challenges of adhering to a medication regimen, recognizing the potential barriers to medication adherence and developing strategies to overcome them, and recognizing the pharmacist's role to improve medication adherence. Challenges included the time and cost associated with the preparation of the materials, and students' initial negative perceptions about the activity.

Conclusions: This medication adherence simulation activity provided an opportunity for PY1 E2P PharmD students to experience medication adherence first-hand. Next steps include revising the adherence activity to address the challenges and adding additional activities during PY2 and PY3 to increase students' abilities to resolve medication adherence issues during clerkships.

PHARMACY EDUCATION

PE05

Development of an Online Over-the-Counter Gastrointestinal Medications Primer for Program Year 1 of an Entry-to-Practice PharmD Program

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Background: Consultations about over-the-counter (OTC) medications to treat gastrointestinal (GI) conditions are common in outpatient community pharmacy practice. It is important for pharmacy students on practicums to possess the knowledge and skills to assess and treat these conditions, and recognize when a referral is required. In the Entry-to-Practice (E2P) PharmD program at the University of British Columbia, the curriculum is delivered as a series of modules organized in a modified body systems approach, with the GI module being scheduled during Program Year 3 (PY3). By the time students engage in this later module, they will have already completed a total of 8 weeks of outpatient community pharmacy practicums.

Objective: The development of an online OTC GI Medication Primer for PY1 E2P PharmD students is described.

Methods: During the 2015-2016 academic year, PY1 students were given a 3-hour in-class tutorial addressing OTC medications to treat nausea, vomiting, diarrhea, and constipation. Based on instructor and student feedback, PY1 students were provided with a narrated pre-recorded presentation and an online quiz the following year. During the 2017-2018 academic year, 3 Directed Studies students created a series of animated videos to replace the pre-recorded presentation.

Results: Benefits to students include possessing basic knowledge about the use of OTC medications to treat common GI conditions earlier in the program in order to assess, triage, and recommend treatment for patients during practicums. Challenges included the time needed to prepare the materials and the training required by students to create the animations.

Conclusions: The OTC GI Medications Primer attempts to minimize any negative impact resulting from the sequencing of modules on PY1 and PY2 students who are on outpatient community pharmacy practicums. Next steps include an evaluation of the OTC GI Medications Primer by surveying students returning from practicums and pharmacy practice educators, and re-examining the sequencing of the modules to identify the need for additional online modules.

PHARMACY EDUCATION

PE06

Atlantic Canadian Hospital Pharmacists in Direct Patient Care: Experiences as Preceptors

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Objective(s): Expanded experiential learning is a major component of the Doctor of Pharmacy program being developed at the Dalhousie College of Pharmacy. Hospital practice sites and preceptors will be vital to this clinical learning. A large survey of hospital pharmacy preceptors in Atlantic Canada was conducted to understand the experiences, learning needs, barriers, motivators, and interest in various preceptor models. The objective of the part of the project presented here was to describe the precepting experiences of pharmacists in direct patient care.

Methods: A literature search was conducted to identify examples of preceptor surveys. Items for the questionnaire came from the literature and the project's Advisory Board members. The draft was piloted, and changes made. In May 2017, the Maritime Hospital Pharmacy Management Group, the four Atlantic branches of the Canadian Society of Hospital Pharmacists, Faculty at the Dalhousie College of Pharmacy, and representatives from the Hospitals in Newfoundland and Labrador were emailed an invitation to participate in the on-line survey to be distributed to staff and members. Statistical analysis was completed using Minitab Statistical Software Version 14.

Results: Approximately 57% of respondents indicated that they were pharmacists in direct patient care and of this group 53% had worked 10 years or less with 40% being from New Brunswick and 37% from Nova Scotia. Ninety-seven percent of the pharmacists in direct patient care had served as a preceptor, with 53% indicating that they had done so for 7 or more years. Fifty-three percent of pharmacists in direct patient care had precepted 1 or 2 undergraduate pharmacy students in the previous 12 months, with 83% reporting that they spent greater than 7 hours per week in precepting related activities. The two most common reasons for not serving as a preceptor were "competing priorities" and "insufficient time".

Conclusions: This information helps inform the development of resources and strategies to sustain pharmacy clinical learning within Atlantic Canadian Hospitals.

PHARMACY EDUCATION

PE07

TransEd: A Collaborative Module to Prepare Healthcare Learners to Provide Care to Transgender Patients

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Study objective: Trans men and women experience increased risks of mistreatment, suicide, and mental illness. Recognizing that current curricula offer little instruction on providing care for this patient group, the University of Waterloo School of Pharmacy and McMaster Michael G. DeGroote School of Medicine partnered to create an online module for healthcare learners. Surveys collected feedback on the results.

Statement of methods: With a preliminary curriculum confirmed using a Delphi method, funding was obtained from Ontario's Ministry of Training, Colleges and Universities (MTCU). Online module development was completed by the University of Waterloo's Centre for Extended Learning. Individual sections were written and reviewed by subject matter experts.

The project's target audience was medical and pharmacy learners, but the ultimate goal is to make the module available to educators in post-secondary healthcare programs for inclusion in their curricula.

Summary of results: The module was launched in 2016 with medical and pharmacy learners and included a workshop with interprofessional case discussions and a guest speaker. The module is now anchored in the Pharmacy curriculum in a final-year seminar course and is in the process of being shared with other programs and institutions.

In a pre-post survey, students reported the greatest change in their ability to "confidently provide care to transgender patients". Regarding the workshop, students viewed it as a "great opportunity to collaborate with other professionals". Module highlights, as articulated anecdotally and in surveys, were the interviews with trans patients sharing their personal stories of transition and experiences with the healthcare system.

Statement of conclusions: TransEd's online delivery makes it readily adaptable to a variety of healthcare curricula. Since few institutions currently offer instruction in transgender care, the module provides a packaged learning program that minimizes in-house development and can ultimately enhance care to an underserved patient community.

PHARMACY EDUCATION

PE08

No Experience; No In-House Partners; No Problem: IPE at Waterloo Pharmacy

Elaine Lillie

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Background: IPE is challenging even when an institution has several healthcare programs in-house with a centralized IPE Office to coordinate activities. With neither, Waterloo Pharmacy still met aggressive Accreditation standards using an innovative inter-institutional model.

Methods: After analyzing best practices Waterloo Pharmacy adopted a system that blends required curricular components with a requisite number of optional events, ensuring a consistent foundation, while still encouraging a customized IPE experience.

To meet its goals, Waterloo Pharmacy fostered relationships with other institutions. Finding willing partners and building effective collaborations underpins the School's IPE strategy. Enabling the implementation was participation in an academic health network outside our Local Health Integration Network (LHIN), a willingness to partner with groups inside and outside our geography, and openness to adapting activities to meet the diverse needs of partners and students.

Results: Waterloo's IPE program offers students a robust roster of IPE activities, some featured below.

Since 2010 we've held case showcases for healthcare students in Waterloo region with more than 10 healthcare programs across four institutions.

Running since 2016, IPE Day is a mandatory session for more than 400 first-year students from Western University's Schulich School of Medicine and Dentistry and University of Waterloo's Schools of Pharmacy and Optometry.

In its fourth year, HIPED is a required half-day workshop for second-year McMaster Medical and Waterloo Pharmacy students.

In partnership with the McMaster Medical School we launched two blended learning initiatives. TransEd educates healthcare students about providing care to transgender patients. Professionalism in Clinical Learning (PCL) is a platform addressing various aspects of professionalism in healthcare.

In January 2018, we offered an inaugural RnRx mandatory event bringing together third-year Conestoga Nursing and Waterloo Pharmacy students to discuss palliative care for an aging couple.

Using a standardized IPE competency survey (ICCAS), students consistently show statistically significant improvement across IPE competencies.

Conclusions: Inter-institutional IPE is difficult but in some ways more representative of the challenges faced in practice where the path to collaboration requires persistence and adaptability.

PHARMACY EDUCATION

PE09

Pharmacy, dentistry, and physiotherapy student perceptions of self-directed interprofessional case-based learning

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Objectives: Interprofessional Education (IPE) occurs when students from two or more professions work collaboratively to learn with each other. IPE is a critically important component for health programs to train students to practice collaboratively. Case-based learning is a common pedagogical approach to simulate team collaboration, but challenges include the lack of trained facilitators to guide small groups, and the logistical difficulties for one facilitator to monitor multiple groups that may be dispersed across campus. The objective of this study was to assess pharmacy, dentistry, and physiotherapy student perceptions of self-directed case-based learning around cardiovascular health and chronic pain.

Methods: Two case-based learning activities were piloted in 2017 – a cardiovascular case for pharmacy and dentistry and a chronic pain case for pharmacy, dentistry, and physiotherapy students. Electronic surveys were conducted for all student participants and included Likert-scale and open-ended questions. Surveys were developed with all three health faculties and gathered information on student perceptions of important learning points, areas for improvement, learning objectives, level of difficulty, and value of activity. Analysis was conducted based on descriptive statistics.

Results: A survey for each activity was sent to a total of 365 students. Survey completion rate was 98%. Students agreed (55%) or strongly agreed (31.5%) that the activity was enjoyable and valuable to learning. Common learning points included the improvement in student understanding of the importance of collaboration and communication, role clarification, and scope of practice for health professionals in patient care. Many students enjoyed the self-directed aspect of the activity and method of delivery. Common areas of improvement included the desire for more health professions involved and more interprofessional questions to generate debate.

Conclusions: Pharmacy, dentistry, and physiotherapy students expressed positive attitudes and value towards self-directed case-based learning, specifically with role clarification. Early exposure to interprofessional learning through shared cases may enhance interprofessional collaboration in future practice.

PHARMACY EDUCATION

PE10

Privacy Impact Assessment and Pharmacy Student Perceptions of Real Patient/Pharmacist Videos in Case-Based Learning

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Study Objectives: Student exposure to patient care is important for student learning, but opportunities in classroom settings can be limited. The objective of this study was to conduct a privacy impact assessment and evaluate student perceptions of a case-based learning activity utilizing a recorded video of a patient/pharmacist appointment.

Methods: A recording of a real-life care appointment between a patient with chronic pain and pharmacist was edited into a video and integrated into case-based learning for second year pharmacy students. The video was not rehearsed and demonstrated an authentic interaction. A Privacy Impact assessment was undertaken, due to the patient health information in the video. Electronic surveys were deployed to pharmacy students that participated in this activity in 2018. Surveys were developed by UBC Pharmacy Faculty and students through a learning grant and gathered qualitative feedback on the method of delivery, video vs. paper cased-based learning, effectiveness in student learning, and areas for improvement. Analysis was conducted by descriptive statistics.

Results: UBC's Legal Counsel, Information and Privacy conducted a privacy assessment and requirements included obtaining written patient and pharmacist consent, hosting the video on a secure online learning management system and written student consent to not distribute video. A total of 220 anonymous surveys were completed by second-year pharmacy students. Students felt the video helped them gain insight into real life practice, particularly the nuances of navigating interviews and keeping patients on track, educating patients on alternative treatments in patient-friendly terms, and prioritizing patient goals in chronic pain. A key area for improvement includes shortening the length of the video, as the appointment was 45 minutes in length. Students felt the activity could be edited into multiple videos for better consumption.

Conclusions: Privacy Impact Assessment is necessary when incorporating real patient/pharmacist videos in student learning. Second year pharmacy students expressed positive attitudes towards real patient/pharmacists videos, specifically around insight into authentic patient interactions. Videos should be shorter in duration to improve future uptake.

PHARMACY EDUCATION

PE11

Perceptions of pharmacy students involved in preventative health and wellness events at the University of British Columbia

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As frontline healthcare providers, pharmacists have an important role to play in public health promotion. The objective of this study was to assess pharmacy student perceptions of involvement in preventative health and wellness events to better inform provision of experiential training.

Electronic surveys were conducted of University of British Columbia (UBC) pharmacy student volunteers involved in heart, bone and diabetes health awareness events and influenza immunization clinics held for UBC employees between 2014-2017. Surveys were developed by UBC pharmacy faculty and gathered information on student demographics, perceptions of preparedness for health promotion activities and knowledge and skill development as a result of participation. Analysis was by descriptive statistics.

Post-event completion, 147 electronic surveys were emailed to student participants to assess perceptions of preparedness for health promotion activities and knowledge and skill development as a result of participation. Completion rate was 40.8%. All respondents perceived an improvement in skill and knowledge development in 1 or more areas of: information gathering, documentation, patient interaction and education and physical assessment/data gathering. Students who rated themselves as confident before and after participation increased from 20.7% to 62.1%, respectively for patient assessment and from 13.8% to 72.4%, respectively for providing patient education.

Senior pharmacy students expressed positive attitudes toward involvement in health promotion activities and experienced a self-perceived increase in knowledge, skills and confidence over a short time period. Early exposure to health promotion activities may accelerate and enhance clinical abilities of pharmacy students while preparing them for emerging pharmacist roles.

Acknowledgement
This work has previously been presented as a poster at the following conferences:
Canadian Pharmacists Conference, June 2-5, 2017
British Columbia Patient Safety and Quality Council Quality Forum, Feb 22-23, 2018

PHARMACY EDUCATION

PE12

Impact of Non-Direct Patient Care Rotations on pharmacy practice: the students' perspective

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At Université of Montréal, each 4th-year Pharm.D. student has to complete a four-week Non-Direct Patient Care (NDPC) rotation where they have to elaborate a project in collaboration with a preceptor. The main objective of our study was to determine if NDPC rotations bring graduating students a different perspective on their practice.

To achieve this objective, an online survey was sent by email to 340 graduating students who had completed the program in the last 3 years.

We received 56 answered surveys corresponding to a participation rate of 16%. The NDPC rotation brought a different perspective on pharmacy practice for 74% of graduating students. The main impact is the initiation of projects in their current practice as 69% are still involved in projects in their pharmacy practice. The majority (98%) of graduating students were satisfied with their experience in the NDPC rotations. Most of them (90%) consider that the NDPC rotations add value to the Pharm.D. program.

NDPC rotations are greatly appreciated by students and preceptors (evaluated last year). Students' participation in NDPC rotations has a lasting effect on their pharmacy practice. NDPC Rotations should remain in the curriculum of the Pharm.D. program.

PHARMACY EDUCATION

PE13

Implementing the Pharmacy Students as Educators (PHASE) Program at the University of British Columbia

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Background: During the 2017-18 academic year at UBC, the PHASE Program was piloted with second year Entry-to-Practice Doctorate of Pharmacy (E2P PharmD) students. It was designed to address the AFPC enabling competency, SC4 (teach pharmacy team members, the public, and other health care professionals) and the need to prepare students to accept a variety of teaching roles throughout their formal education and later in their pharmacy careers.

Study Objective: To describe the implementation of the PHASE program's pilot year as well as perceived challenges and benefits.

Methods: The PHASE program will span three years. The first year of PHASE (2017-2018) was implemented with ~220 second year pharmacy students, beginning with a large-group didactic session on effective teaching. One week following, students met in small groups to present and obtain peer and facilitator feedback on teaching sessions they had prepared based on newly learned teaching principles. Students completed online surveys to inform our understanding of: a) how the PHASE program is working to support students as future pharmacist-educators; b) students' perceptions and experiences related to teaching and learning.

Results: This program was created to support students in the development of their teaching knowledge and skills and to encourage students to begin seeing themselves as educators. Students had the opportunity to apply the skills gained from their didactic session and obtained timely feedback to further refine and develop their future role as pharmacist-educators. Challenges included logistical issues and the cost to implementing small group sessions.

Conclusions: The implementation of the PHASE program provides an opportunity for E2P PharmD students to become aware of their role as educators and to develop their teaching knowledge and skills. Next steps include developing, implementing and evaluating the second and third years of the program, and developing a plan for its sustainability.

PHARMACY EDUCATION

PE14

The Impact of PHarmacy Students as Educators (PHASE) and a Simulated Teaching Environment on Program Year 2 Students in an Entry-to-Practice PharmD Program at UBC

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Background: During the 2017-2018 academic year at UBC, the PHASE Program was piloted with Year 2 (PY2) Entry-to-Practice (E2P) PharmD students at UBC. The program provided opportunities for students to see themselves as pharmacist-educators by providing a simulated teaching environment.

Study Objective: To evaluate the impact of the PHASE program on PY2 students.

Methods: During the pilot year of PHASE, PY2 E2P PharmD students participated in a didactic session on effective teaching. The following week, students were assigned to small groups and each student delivered a mini-lesson during an academic-half-day (AHD). After each lesson, peers and a facilitator provided feedback. Quantitative survey data was collected from students before the didactic session and after the AHD to evaluate students' beliefs about their confidence and competence in teaching. For example, students responded to the statement "I am able to conduct an educational session" using a Likert scale. Qualitative data in the form of responses to open-ended questions, such as "What did you learn by teaching today?" were asked post-AHD to gather students' self-reflections about the simulated teaching session.

Results: Before the didactic session, 39.8% of respondents agreed or strongly agreed that they are confident in their ability to educate a group. After the AHD, this number increased to 80.7%. After the AHD, the number of respondents who felt they are able to conduct an educational session increased from 42.8% to 80.3%. Analysis of open-ended responses revealed insight into how PHASE impacted students' beliefs about themselves as pharmacist-educators.

Conclusions: Based on student survey data, the PHASE program had a positive impact on students' self-report that they are able to educate a group and conduct an educational session. Next steps include implementing and evaluating the second and third years of the PHASE program.

PHARMACY EDUCATION

PE15

The Evaluation of the Development and Implementation of a New Institutional Practice Skills Course and Corresponding Practicum in an Entry to Practice Doctor of Pharmacy Program

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Objectives: To evaluate the effectiveness of an institutional practice skills course (PHRM 251) and corresponding introductory institutional practicum (PHRM 272) in preparing 2nd year Entry-to-Practice Doctor of Pharmacy (E2P PharmD) student pharmacists for their advanced pharmacy practice experiences (APPEs) in institutional settings.

Methods: A literature search was conducted to characterize the importance of having an early exposure institutional course and practicum and to identify themes for course content. An environmental scan was also performed to identify current similar courses and/or practicums across Canada. Email data was collected from optional course evaluations from students upon completion of PHRM 251 and mandatory course evaluations from students upon completion of PHRM 272. An optional online survey was also administered to 2nd year students to solicit further feedback after they had completed both PHRM 251 and PHRM 272. Additionally a focus group with practice educators was also conducted.

Results: Student pharmacists and practice educators evaluated the courses as beneficial. Overall student pharmacists found the workload, duration, and structure of activities in PHRM 251 and 272 to be optimal for their learning but would appreciate increased shadowing time with hospital pharmacists and patient interactions during practicums. Students and practice educators felt the courses should be continued with minor adjustments made to increase practice with the Drug Information Request (DIR) activity in PHRM 251 and to evaluations and/or activity checklists in order to accommodate site-specific requirements.

Conclusions: Training of students early in the curriculum for institutional pharmacy practice is perceived to be highly valuable by both students and practice educators. Overall, PHRM 251 effectively prepared student pharmacists for PHRM 272. After completing PHRM 272, student pharmacists felt more confident about starting their advanced pharmacy practice experiences.

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PHARMACY EDUCATION

PE16

Developing a Train the Trainer Program for Pharmacy Practice Educators

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Background: Experiential practicums in the Entry-to-Practice PharmD program at the UBC Faculty of Pharmaceutical Sciences (FoPS) have increased to 42 weeks, dispersed across rural and urban sites in the province. With more students relocating for practicums, the need for accessible and timely resources for students experiencing wellbeing-, academic-, and/or professionalism-related challenges during practicums outside of the Lower Mainland (OLM) is anticipated. A Train the Trainer (TTT) program would enable practice educators, during a practicum, to recognize and support students with these challenges.

Objective: This project seeks to evaluate the need for, as well as to design the delivery of, a TTT program for pharmacy practice educators located OLM.

Methods: Interviews and surveys were completed to understand the perceived barriers and support needs for students completing practicums OLM, along with further understanding of practice educator development and support needs for those located OLM. A comprehensive literature search informed the optimal approach to design and deliver a training program. Additionally, health professional programs within UBC were surveyed regarding student challenges on experiential experiences in their programs, current resources utilized to address such challenges, and potential for collaboration.

Results: A student-led needs assessment identified that 30% of student respondents experienced challenges during their practicums and of these, wellbeing-related challenges were the most prevalent at 77%. The third most common challenge noted by practice educators, preceded by time and workload, was identifying students with wellbeing-, academic-, and/or professionalism-related challenges. The literature reviewed indicated the optimal TTT program would incorporate a blended approach of interactive and didactic styles, with additional supports provided post-training. Six of the seven survey respondents from health professional programs at UBC indicated interest in reviewing and adapting a developed TTT program to enhance student support in their own programs.

Conclusion: Once developed, the TTT program will offer needed student support for practicums occurring OLM and provide practice educator development and support, with potential for adaptation and use in other programs at UBC.

PHARMACY EDUCATION

PE17

Assessment of professional competencies using an electronic portfolio for resident pharmacists in hospital residency

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Background: In fall 2017, the 16 months hospital residency called Master in advanced pharmacotherapy was increased from 48 to 60 credits and has been developed as a competency-based professional program at Laval University. The Pharm.D. was implanted in 2011 and the learning model involves four phases, each corresponding to one year of training. Both programs are built around the development of five professional competencies: implementation of medication therapy, dissemination of pharmaceutical knowledge, handling medication, managing pharmacy operations and commitment to professionalism.

Objective: The objective is to share the development of a course dedicated to the assessment of professional competencies using an electronic portfolio for resident pharmacists in hospital residency.

Method: A course was developed in the new hospital residency program with the help of a pedagogical advisor. At the end of their program, the residents have to demonstrate that they have reached the expected level in terms of the related competencies using an electronic learning portfolio.

Results: The new hospital residency program is organized by training units and became the fifth phase of learning model. Diversified learning methods including theoretical, practical, simulation-base and professional experiential learning were involved in the revised hospital residency. Students must build their electronic portfolio and deposit their achievements throughout their program. The portfolio is structured according to the five competencies of the program. The demonstration for achieving the expected level is done by written reflection, where the students refer to their achievements, called proofs. The professional qualities specific to the program must be taken into account in the students' self-evaluation. A pharmacist mentor is assigned to each resident and meets with him periodically.

Conclusion: The course allows residents to build their electronic learning portfolio and demonstrate they achieved the expected level for each competency. This self-assessment of competencies course is an innovative component of the residency.

PHARMACY EDUCATION

PE18

Exploration projects for last-year pharmacy students

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Introduction: In 2011, Laval University launched an undergraduate Doctor of Pharmacy program (Pharm.D.). The new program is built around the development of five professional competencies. Learning activities are developed through a continuum that includes theoretical, practical, simulation-based learning, professional experiential, review and feedback.

Objective: To allow the fourth year students to continue their process of reflection on the practice of the profession, according to the direction they wish to give to their professional life. The experience of the first three cohorts will be shared.

Methods: A course was developed in the new program with the help of a pedagogical advisor. Data from the first three cohorts (2015 to 2017) was collected on the number and types of projects completed and the success rate.

Results: Students must register for two exploration project courses (3 credits each) in the fall and winter sessions of their final year in the Pharm.D. program. In autumn, they determine their project, find a director, conduct a literature review and propose a project implementation plan. In winter, they complete the project, write a report and abstract, make a poster presentation to the faculty and correlate their results with their goals established at the beginning of the project. Since the implementation, the exploration projects have been carried out alone or in teams of 2 to 4 students: 2015 (n=85), 2016 (n=65), 2017(n=60). Students completed field projects (71%), essays (27%) or research projects (<3%). Implementing an information and follow-up clinic to optimize treatment of patients with attention deficit disorder is an example of a field project realized in 2017.

Conclusion: The exploration project allows students to develop their skills through the accomplishment of a field project, an essay or a research project. It contributes to the continuity of learning evaluations and to the strength of our professional competency-oriented program.

PHARMACY EDUCATION

PE19

Manitoba Pharmacy Preceptor Learning Needs Environmental Scan as an Elective Rotation

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Background: The College of Pharmacy at the University of Manitoba is transitioning to a PharmD program. This significant change in demands on preceptor time and their interaction with the university warrants investigation. As a foundational step toward designing a preceptor learning needs assessment, an environmental scan of recently conducted preceptor surveys completed across Canada, was undertaken. A 4th year student, with an interest in pharmacy education and policy conducted the environmental scan as a 7 week elective. The process and deliverables were decided in collaboration with the student and the elective preceptors; an Experiential Education Program Coordinator, health sciences Educational Specialist, and a health sciences Librarian.

Objectives: The learning objectives for the student focused on increasing knowledge of education research processes, pharmacy education program development, and developing collaborative project management skills.

Methods: A project management approach was taken to identify deliverables, timelines, and communication processes during the elective. In consultation with the librarian preceptor the student conducted a literature review using PubMed, EMBASE, Scopus, ERIC databases, and grey literature. The student conducted telephone interviews with Pharmacy Experiential Programs of Canada members and affiliated individuals.

Results: Major themes found included the methodologies of needs assessments, preceptor development programs, challenges and barriers to preceptorship within PharmD programs, and preceptor teaching strategies. Other topics such as skills and qualities of an effective preceptor, preceptor development topics, and delivery of preceptor development were also reviewed. The student provided the elective preceptors with files that included; a detailed summary of the themes, the project process, all collected data, and a learning reflection.

Conclusions: The needs assessment themes identified will contribute to the next step of the preceptor needs assessment design. The student reflection highlighted the importance of involving practice preceptors and valuing their opinions in the transition to the PharmD. The student demonstrated achievement in the following AFPC outcomes; leadership, manager, scholar and professional.

PHARMACY EDUCATION

PE20

Student cohort comparisons of the changes in study-approaches during transition to a competency-based professional programme

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Objective: UBC's new E2P Pharm D curriculum, employing learning-centered philosophy and competency-based education principles, represents substantive changes in design from individual discipline-based courses to team-taught integrated modules based on disease-states and/or body systems. The assessment program of the curriculum has also transitioned from traditional course-based, high-stakes mid-term and final examinations to emphasis on formative assessment and multiple low-stakes summative assessments. As part of the impact evaluation of the curriculum, students from 2016-2017 and 2017-2018 first-year classes participated in surveys aiming to capture the changes associated with this transition. This study compares two cohorts of students on the changes in their approaches to studying as they enter the programme from more traditional University programmes.

Methods: Incoming students to the 2016-17 and 2017-18 academic years were asked to complete short surveys at the beginning of the school year and at the end of terms 1 and 2. The surveys inquired into the amount of time within a typical week students devote to studying and formative assessment, time management regarding their study habits, favoured individual or group study setting, and preferred study aids. The two cohorts were compared on indices for these areas and the dynamics of change throughout the year.

Results: The demands of the PharmD program required students to re-evaluate their study habits. Common trends of the transition included an increase in the estimated study time and the number of students "staying on top" of the material through regular studying. Very few students in both classes allowed materials to accumulate until just before quizzes or exams. Instructor-provided or student-made notes, as well as organizing, re-writing, and comparing notes, were the most relied upon study aids for both groups. The two classes differed in their preference for group study.

Conclusions: By gaining greater awareness about students' approaches to studying and their study habits, the Faculty was able to monitor the program proactively and plan for adjustments.

PHARMACY EDUCATION

PE21

Psychometric evaluation and modeling for precision the grading system of an assessment-intensive programme

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Context and objective: The programme, administered by the Continuing Pharmacy Professional Development faculty at UBC, spans 12 weeks and includes sessions from three pharmacy practice skills areas: Patient Dialogue (PD), patient interaction skills, assessed in the context of role-play scenarios; Therapeutics (TH), assessed through care plan development assignments; and Pharmacy Practice Lab (PPL) skills, assessed through fulfilment of authentic practice tasks. Each week the participants in the programme submit assignments in the three areas. The results are used for formative purposes during the first 8 weeks. Grades in the program are based on the results from the assignments in weeks 9 to 11. The goal of this study is to evaluate the precision of the measurements reflected in the grades for the components and the final mark, and to identify ways to improve the precision of the grading system.

Methods: One cohort's twenty anonymized records provided data for the analyses. Generalizability analyses estimated reliability (index of precision) of the grades for each skill area and the final grade. Decision studies in the context of generalizability theory modelled the changes in precision with changes in the number of data-points. Classical theory approach to reliability of composite scores was used to evaluate the precision of the final grade and to model the impact of different weightings of each assessment area in the final grade.

Results: The reliability (0.75) and associated standard error of measurement (2.84) of the final grade are at the lower end of acceptable precision. These can be partially improved by redistributing the weight of the components to reflect components' reliability or by increasing the number of data-points for low-reliability measures, as evidenced by the decision studies.

Conclusions: The effect of both approaches to improving precision would be positive but limited by the length of the program and the already lower relative weight of the less reliable measures. Refocussing the grading on competencies rather than on tasks might be a better solution.

PHARMACY EDUCATION

PE22

A comparison of the function and impact of formative assessments in UBC's E2P PharmD program

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Study Objectives: This study examines a two-year project initiated to develop a formative assessment program for UBC's new PharmD curriculum. Along with faculty experts, advanced students contributed to low-stakes, 10-20 question formative assessments called Checkpoints (CPs), created to support students' learning through regular practice, feedback for self-assessment, and study guidance. Focused on program years 2 and 3 (PY2 and PY3), the objective was to explore the degree to which CPs fulfilled their intended functions and impacted student learning, and to compare findings from each year.

Statement of Methods: The PY2 and PY3 formative assessment programs were evaluated through module evaluation surveys administered for each of eleven medication management modules (5/PY2 and 6/PY3). Using a 5-point Likert scale, students rated the CPs on 4 questions related to practice, self-assessment and study guidance; 2 written response questions identified strengths and improvements. Learning impacts were studied through student CP usage patterns and correlations between usage patterns and performance on summative assessments. Web-analytics for identifying usage patterns included frequency and duration of access to the CPs; correlations were calculated using Excel while narrative comments were analyzed for themes. The two years were compared in these areas.

Summary of Results: In five modules in PY2 and three out of six modules evaluated for PY3, student respondents agreed that the CPs enhanced their learning and fulfilled their functions. Majority of respondents agreed that the formative assessments covered the relevant material, provided effective practice, and helped them keep-up and identify learning gaps. Analysis of the narrative comments identified a number of ways that the CPs can be improved including adding more questions, increasing their difficulty, broadening questions formats from mostly multiple choice formats to case-based scenarios, and providing better feedback and alignment of CPs with summative assessments. Analysis and analytics of the remaining three modules in PY3 will be compiled, examined and compared to PY2 at the close of the year (April 2018).

Statement of Conclusions: The formative assessment program is currently being implemented in PY3 of the PharmD curriculum. Future iterations of the formative assessment program will respond to students' suggestions for improvements.

PHARMACY EDUCATION

PE23

Incorporating Advanced Pharmacy Practice Experience (APPE) students into an Alternate Level of Care (ALC) patient care team: a pilot study

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Objective: Describe how placing APPE students within an ALC team contributes to patient care and student learning.

Methods: We piloted APPE students on the ALC patient care team for 6 months. Student caseload was determined by recording the number of patients followed of the total on the ALC team. All interventions suggested by students were reviewed for appropriateness by the preceptor prior to presentation to the medical team. Preceptor time was documented. Pharmacy students and inter-professional team members completed a satisfaction survey at the end of each rotation block. Specific outcomes measured: 1) Number of patients assessed and monitored by APPE students per week, 2) Numbers and type of interventions provided by APPE students, 3) Preceptor's and health care team's acceptance rate of APPE student interventions. 4) Students' and interprofessional team satisfaction with the rotation.

Results: Three APPE students completed their required institutional APPE rotations from June 2017-Dec 2017. Students followed 49.6% (27.9%-77.0%) of team patients across all rotations. A total of 119 drug therapy interventions were completed over 25 weeks. The most frequent types of interventions were adjusting medication doses (34.5%) and deprescribing (15.1%). The pharmacist supervisor spent an average of 1.3 hours (0-3.25 hours) daily precepting. Pharmacist supervisor and medical team acceptance rates of pharmacy student interventions were 96.6% and 88.3%, respectively. All APPE students would recommend the rotation to future students and the interprofessional team was very satisfied with having APPE students as part of the ALC team.

Conclusions: APPE students contribute meaningfully to the care of patients on the ALC team. Students made medication therapy recommendations that were accepted by the pharmacist supervisor and medical team. Students felt patient care activities and responsibilities on the ALC team were valuable to their learning.

PHARMACY EDUCATION

PE24

Evaluating online learning: Focus on patient/medication safety for healthcare professionals

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Objectives: To increase engagement with patient/medication safety education, a series of online modules were storyboarded utilizing best practices in online learning. The objective of this project was to design an effective strategy to evaluate online training modules with respect to learner engagement, satisfaction, and knowledge acquisition.

Methods: Utilizing best practices in online learning, an introductory online module on patient/medication safety for healthcare professionals and students was developed using Adobe® Articulate Storyline 3. The module was pilot tested among pharmacy students, pharmacists, and subject matter experts in online education. The online evaluation strategy aligned with the first three levels of the Kirkpatrick's Model for Training Evaluation: (1) learners' reaction or satisfaction; (2) learners' knowledge acquisition; and (3) learners' potential behavioural changes, by using a series of multiple-choice, Likert-scale, and open-ended questions to assess learners' engagement, satisfaction, knowledge acquisition, as well as their perception of the module's strengths, areas of improvement, and suggested revisions for future online modules.

Results: The knowledge acquisition level was fair with a 78% average on the multiple-choice quiz component of the online evaluation form. The learners' satisfaction and engagement were negatively impacted by a lack of visual aids and on-screen player's controls. Clear learning objectives, organized content, and substantial utilization of interactive activities increased learner satisfaction. Similar findings pertaining to satisfaction and engagement of learners were reflected in the open-ended questions regarding module strengths, areas of improvement, and suggested revisions.

Conclusions: Our online evaluation strategy highlighted the strengths and areas of improvement of the introductory patient/medication safety module. Learners' feedback and suggestions are instrumental for subsequent development of future online training modules within the series. With increasing uptake of online education, the application of best practices in online learning, design of effective evaluation strategies, and learners' preferences in module revisions are transferable to the development of online content beyond patient/medication safety in pharmacy curricula.

PHARMACY EDUCATION

PE25

Program evaluation of the undergraduate Pharmacy program at the University of Manitoba: New directions and implications for admissions and achievement of educational outcomes in the Pharm.D. program

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Objectives: Several studies were conducted to evaluate two areas in our pharmacy program: (1) Admissions and (2) Achieving Educational Outcomes.

Methods: Across all studies, data consisted of student grades in pre-pharmacy courses, performance in the pharmacy program, student and employer ratings of graduate attainment of educational outcomes, and subsequent scores on the PEBC Qualifying Examination. Using a variety of innovative methods such as Bayesian network modeling and structural equation modeling, we evaluated the validity of the admissions criteria for our current B.Sc.(Pharm.) and to inform changes for our Pharm.D. program, and students' overall achievement of educational outcomes.

Results: Beyond the main finding that overall Pharmacy GPA was predicted by incoming GPA and core course repeats, we identified the interaction between core course repeats and incoming GPA toward predicting academic difficulty in the pharmacy program. Admission essay scores were significantly correlated with performance in Problem Based Assessments that assessed both written and verbal communication skills. Our curriculum mapping study found a clear concordance between our intended and learned curricula and between the self-perceptions of graduating students in meeting the educational outcomes and employer ratings of their performance. In further analysis that controlled for incoming GPA, the correlation between overall performance in the pharmacy program and overall performance on the PEBC Qualifying Examination was 0.83.

Conclusions: Our work in admissions has provided greater knowledge of our admissions process in several areas that include how much each of the background characteristics should be weighted, and how well individual admissions criteria (e.g., admissions essay) predict performance within specific parts of the pharmacy program (e.g., communication skills). Our work in assessment of educational outcomes has provided a clearer understanding of how well students have achieved each outcome, and stronger validity evidence of our students' achievement of educational outcomes.

PHARMACY EDUCATION

PE26

Interprofessional stroke team simulations: improving knowledge and skills for practice

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Introduction: Collaborative interprofessional (IP) care is the accepted best-practice standard in stroke. This IP stroke team simulation offered a shared educational experience that efficiently addressed application of clinical knowledge and IP competency development.

Methods: A total of 386 students (356 on-site, 30 distance technology) from medicine, nursing, occupational therapy, physiotherapy, pharmacy and speech language pathology were divided into 60 teams of five to seven students. All students completed the collaborative care plan simulation and the 356 on-site student teams participated in a two-station stroke clinic team simulation. Following both simulation events, voluntary and anonymous program evaluation forms were provided to all students. The evaluation included the interprofessional collaborative competency assessment scale (ICCAS) and five qualitative questions probing the simulation experiences.

Results: The ICCAS scores for the collaborative care plan (378; 98% response rate) and the stroke clinic (340; 96% response rate) found a significant change ($p < 0.05$) in pre-post ratings for both simulations events, regardless of profession or previous IP experience. A larger shift in pre-post ratings was found in the stroke clinic simulation. Thematic analysis of reflective questions indicated deep learning for IP competencies, with preference for the stroke clinic simulation.

Conclusion(s): The collaborative care plan team meeting and the stroke clinic are effective and valuable simulation designs for stroke content and IP knowledge. Learners demonstrated a preference for the team-based stroke clinic simulations.

This poster was previously presented at the 8th Annual Canadian Stroke Congress. Calgary, AB, September 9-11, 2017.

PHARMACY EDUCATION

PE27

An online, live-streamed, interactive, intraprofessional activity: student perceptions.

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Objectives: Our study aims to assess pharmacy student and pharmacy technician student perceptions of a new, online, live-streamed, interactive intraprofessional education activity. The majority of technician programs are offered by smaller, for-profit institutions, which can exacerbate existing challenges in logistics and achieving desired disciplinary-ratios of students. While available literature supports the value of intraprofessional events between pharmacy and technician students, interactive, live-streaming platforms have not been well established as a method to enable this type of learning.

Methods: The activity was divided in to a traditional lecture component followed by multiple, rapid-fire case-based scenarios. One electronic post-activity survey was developed for both pharmacy and technician students. Questions were on a 5 point-likert scale or short answer style. Unique enrollment codes were created for the survey to segregate data from each of the participating institutions.

Results: An online survey link was deployed to each of the participants, including 220 pharmacy students. 55% of respondents "strongly agreed" that the level of difficulty of the activity was appropriate while 52% "strongly agreed" that they enjoyed the activity and found it valuable. Qualitative results were largely positive, with the majority of respondents stating that the online platform was essential to enable this collaboration. Critical comments were grouped in to three primary themes: (1) the need for improved moderation of the chat, (2) restricting when the chat feature was enabled, and (3) allowing more time for interactivity, discussions and questions.

The volume of participants on the chat was beyond the expectations of the instructors, with student comments even suggesting "there should be a separate section for those who are actually asking questions and those who are just making comments."

Conclusions: Pharmacy and technician students' positive attitudes towards an online, live-streamed, interactive intraprofessional activity supports future development of activities that can typically be limited by logistical barriers with face-to-face events. Deploying follow-up surveys after experiential rotations could be used to correlate the findings.

PHARMACY EDUCATION

PE28

Use of Team Based Learning in an Advanced Pharmacotherapy Course

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Objective: To describe the use of Team Based Learning (TBL) as an instructional method in an advanced pharmacotherapy course in a newly established PharmD bridging program to enhance student's critical thinking, collaboration, and professional learning skills.

Methods: The TBL approach was selected for its logical and structured framework for flipping the classroom experience for students to solve authentic patient cases. Students are purposefully assigned to small teams to work through the TBL process that includes: preparing individually prior to the classroom session, completing a readiness assurance test (high-level multiple choice questions completed initially as individuals, then as a team, followed by a group debrief) and collaborating to answer a series of directed questions (knowledge application, critical thinking, and decision making, as they relate to complex patient case scenarios) followed by an instructor-led group debrief. TBL is designed to promote individual and team accountability; students not only increase their confidence in applying knowledge in new situations, but also learn how to learn and productively collaborate. Students were invited to complete a survey of their experience following completion of the course. These results along with feedback from the university's Universal Student Rating of Instruction process are used as a basis to evaluate the TBL student experience.

Results: Sixty-five students participated in the course from June to August 2017, with 6 teams (n=30) completing the survey and n=33 individuals completing the USRI. Students self-reported spending several hours preparing individually for the classroom sessions, focusing on mandatory pre-readings. Few teams collaborated prior to class but found value in team discussions during and following classroom sessions, while completing assignments. Students provided several comments to describe their positive experiences and challenges with this TBL experience. Similar instructional approaches promoting student-initiated learning will be useful in pharmacotherapy courses in entry-to-practice PharmD programs.

Conclusion: TBL was an effective instructional method for the delivery of an advanced pharmacotherapy course. Student feedback will lead to modifications for future delivery.

PHARMACY EDUCATION

PE29

Vaccination by the pharmacist: Impact of an awareness program for pharmacy students

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Background and objectives: Immunization prevents millions of deaths per year. Pharmacists have been involved in immunizations programs in many way including education, facilitation, reference and injection authority. In Canada, most provinces have given to pharmacists an injection authority. The aim of this study is to evaluate the impact of an awareness program for pharmacy students.

Methods: Descriptive pre/post study. In November 2017, first year Pharm D students were exposed to 10-minute video focusing on influenza/pneumococcal infections, immunization coverage and the evidences about the roles and the impacts of pharmacists in immunization. A pre-post online survey was administered to capture their profiles, knowledges, behaviors and satisfaction. Only descriptive statistics were performed.

Results: 199 students were surveyed (participation rate:100% pre;93% post). Concerning profiles, 67% of respondents in pre had not been vaccinated for the flu in the last three years but, 59% in post planned to do so. Concerning knowledges, only 20% in pre were aware of the immunization schedule of the Quebec immunization protocol but 99% considered the absence of causal relationship between vaccines and autism. Concerning behaviors, the intervention was associated with a significant increase of respondents that would verify vaccination status (93%vs70%;p=0.0001), document vaccination status in patients' records (96%vs86%;p=0.001) and identify eligible patients for vaccination (98%vs90%;p=0.002). Respondents would agree to be vaccinated by a pharmacist (86%vs91%,NS). Only 12% were exposed to the literature of the roles and impacts of pharmacists in immunization but 93% in post were interested to read them. Concerning satisfaction, 99% did appreciate the intervention and 97% were interested to participate to other similar interventions.

Conclusions: This original intervention increase awareness of pharmacy students about the involvement of pharmacists in vaccination and shows benefit of being exposed to the literature about the roles and the impacts of pharmacists. Students can be mobilized and contribute to better patients' immunization through their training.

PHARMACY EDUCATION

PE30

Comfort level assessment of a cohort of pharmacy residents exposed to a validation simulation

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Context: To practice a health profession involves making choices.

Objectives: The aim of this study was to assess the perception of the level of comfort of pharmacy residents to perform actions related to the dispensing of a new drug.

Material and methods: This is a descriptive cross-sectional study. A 10-steps simulation with incremental element of information was proposed to pharmacy residents in which they had to estimate their comfort level according to five dimensions (e.g. drug effectiveness, drug safety, drug cost, compliance with current rules, global comfort level to perform the proposed action). The comfort level was self-measured using an ordinal scale from 1 to 10 per dimension. The level of comfort was either uncomfortable (e.g. score of 1,2,3), partly comfortable (4,5,6) or very comfortable (7,8,9,10). Each respondent had to indicate his level of comfort for 50 opportunities. A questionnaire was used to assess residents' perceptions related to the simulation. Only descriptive statistics were performed.

Results: A total of 72 respondents participated (participation rate: 100%) to the simulation. Respondents were very comfortable to perform the proposed action only 2 times out 50 opportunities. Respondents were uncomfortable to perform the proposed action 25 times out of 50 (e.g. drug efficacy (n=3), drug safety (n=2), drug cost (n=9), compliance with current rules (n=5), global comfort level (n=6)). While more than 80% of respondents said they are adequately trained to evaluate drug effectiveness and safety, 86% did not feel adequately trained to evaluate the cost-effectiveness of a drug for a given patient in a clinical setting. Only 57% of respondents felt adequately trained to determine if a prescription were compliant with current rules in place.

Conclusion: Pharmacy residents need to be better trained to make drug therapy choices, especially when considering drug costs and compliance to current administrative rules.

PHARMACY EDUCATION

PP01

Canadian clinical pharmacy practice in 2016-2017: a national survey

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Background: Clinical pharmacy is a health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, and disease prevention.

Methods: This is a cross-sectional study based on a survey of Canadian hospitals with at least 50 acute care beds. The aim was to describe the Canadian clinical pharmacy practice. The survey was conducted online between May-July 2017 for the fiscal year 2016-2017. Only results related to clinical pharmacy practices were extracted.

Results: 83% (153/184) of respondents indicated that they had a pharmacist assigned to at least one of the 17 outpatient programs and 97% (178/184) to at least one of the 18 inpatient programs. Two practice models appear dominant: clinical generalist model with limited differentiation of roles (45%) and comprehensive model with pharmacists in distributive, generalist, specialist roles (43%). For 91% of respondents, pharmacists are involved in identifying, developing, reviewing or approving new medication order sets; for 82%, the pharmacy department has identified drug therapy management as a service that should be provided consistently by pharmacists, for 75%, pharmacists adjust dosing of medications on the basis of the patient's response or pharmacokinetic characteristics, for 75%, pharmacists review medication orders before the first dose is administered, for 73%, drug therapy management services are prioritized for inpatients according to the complexity of patients' medication therapy and for 71%, pharmacists are involved in monitoring and reporting potential and actual adverse drug events. Data has been collected for eight clinical key performance indicators (min: 27% for patient education at discharge and max: 57% for medication reconciliation on admission).

Conclusion: Clinical pharmacy practice should be pivotal in the organizational plan of a pharmacy department. Current data in Canada suggests a continued progression of clinical pharmacy in hospitals.

PHARMACY EDUCATION

PP02

Adverse drug reactions' codification by medical records technicians and comparison with pharmacovigilance reporting: toward a solution to respect the requirements of Vanessa law

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Background: Before the implementation of Vanessa law, which will make mandatory reporting of serious and/or unexpected adverse drug reaction (ADR), we decided to review our reporting practices. The objective is to compare the data on ADRs found by medical records technicians (MRT) with those of the pharmacy pharmacovigilance program (PVP). The second objective is to validate the quality of the information collected by the MRT in order to respect the requirements of Vanessa's law.

Methods: We proceeded to a comparative study of the ADR identified by the MRT with those declared by the PVP. We described the differences found and tried to identify the root causes. We also described discrepancies between the patient medical record and the ADR coding.

Results: A total of 263 ADRs were identified from April 1, 2017 to September 1, 2017 in our hospital, 94,7% (n = 249) of these ADRs were identified by the MRT and 6% (n = 16) by the PVP. Only 2 were identified by both MRT and PVP. Twenty-one coding changes were proposed and validated by the MRT, for example: wrong antibiotic code or confusion with medical device reporting.

Conclusion: This study highlights the high volume of ADR identified by MRT. We also note the disparity of the data between the identified and codified ADRs by the MRT and those by PVP. Regular communication with MRT and PVP could increase our declarations on one hand and improve the identification and coding of the ADR by the MRT on the other hand. Thus, collaboration with the MRT seems promising in the future application of the Vanessa law.

PHARMACY EDUCATION

PP03

Drug shortages in Canada: current data in 2016-2017 and perspective

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Background: There are many signs of the growing importance of drug shortages in Canada and around the world. Although drug shortages affect clinicians and patients on a daily basis, there is still too little literature describing the problems experienced and the clinical consequences of these shortages. The aim of this study is to describe the situation regarding drug shortages in 2016-17 and to discuss this issue in the Canadian context.

Methods: This is a retrospective descriptive study based on data from one Canadian wholesalers and the official Canada Drug Shortage Reporting Site.

Results: From August 31st, 2016 to September 4th, 2017, there were 583 drug shortages from the McKesson database, compared to 2,129 at the drug shortage website for an average of 160 ± 180 days at McKesson, compared to 118 ± 113 days for Canada. A majority of drugs in short supply were from generic drug companies (85% at McKesson vs 81% in Canada). Twenty-six percent of shortages at McKesson and 14% of shortages in Canada were from parenteral forms. The leading drug classes in both McKesson and Canada were central nervous system drugs (26% vs 32%), cardiovascular drugs (12% vs 22%), anti-infectives (11% vs 9%), gastrointestinal drugs (8% vs 6%) and antineoplastic drugs (7% vs 5%).

Conclusion: This descriptive study highlights a high number of shortages in Canada in 2016-17. The new regulation on the obligation to declare drug shortages will probably lead to better monitoring of this problem at the national level. But although the causes of shortages are often identified, manufacturers and regulators are still too often powerless to fight and effectively prevent drug shortages.

PHARMACY EDUCATION

PP04

Tools that Measure Characteristics Associated with Pharmacist Success

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Objective: The primary objective is to identify tools that measure constructs of pharmacist success. These constructs were identified through interviews of successful pharmacists and a scoping review of the literature. The purpose of this research is to better understand characteristics that predict pharmacy practice success to potentially inform admissions processes and pharmacy curricula.

Methods: A literature search was conducted in MEDLINE (1990 – January 2018) to identify articles describing tools that measure the constructs motivation, critical thinking, work life balance, emotional intelligence, and/or personality traits. The search was restricted to English-language articles reporting on healthcare professional school admission processes. Success was not included as a search term. Google Scholar was also utilized after screening in an attempt to identify further tools measuring motivation and work-life balance. Identified tools were organized using a concept map to demonstrate the scope of construct measured and overlap between individual tools.

Results: Of the 860 articles identified, 72 included a description of 58 potentially relevant tools. Most articles described one or more tools measuring a single construct (n=57); however, some incorporated multiple tools measuring 2 or 3 separate constructs. Identified tools in the included articles measured the intended constructs: motivation (n=5), critical thinking (n=7), emotional intelligence (n=19), and personality traits (n=49). Tool completion time ranged from 1 minute to several hours, and cost for the use of tools varied from free to approximately $100 USD per subject.

Conclusion: Although several relevant tools were identified that measure select constructs of interest, no comprehensive tool capturing all relevant domains was found. In addition, most tools were lengthy and/or had significant cost associated with administration, making them unfeasible for use in future research.

PHARMACY EDUCATION

PP05

The Co-Located Pharmacist Model: Opinions and Barriers from the Community Pharmacist, Physician, and Patient.

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Objectives: Our study aims to understand the opinions and perceived barriers of patients, community pharmacists and family physicians on a new, co-located pharmacist model in primary care. While various team-based primary care models have been explored across Canada, there is a need to better understand the role of the community pharmacist and the perspectives of the patient and physicians.

Methods: 3 paper-based surveys were developed for patients, physicians and community pharmacists. Questions were on a 5 point-likert scale or short answer style. Patient and physician surveys were collected from one clinic where co-located pharmacist services had been ongoing. Community pharmacists were surveyed from 10 pharmacies within closest proximity to the clinic.

Results: 22 pharmacists were surveyed with the majority indicating "confidence in their ability to innovate and expand their scope of practice" (Mean=4.18, SD=0.73), that "physicians who work closely with community pharmacists significantly improve the quality of patient care" (Mean=4.50, SD=0.51), and that "co-located pharmacists can help improve communication and collaboration between physicians and community pharmacists" (Mean=4.32, SD=0.65). Hesitancy towards major change was frequently mentioned as a barrier, including a lack of support from corporations or other healthcare providers. Other barriers included a lack of funding/time, inadequate staffing, and training.

Patients and physicians agreed that the co-located pharmacist is a "valuable addition to the health care team" (Mean=4.16, Mean=5.00), and wanted "increased frequency of pharmacist visits". Foreign language needs and the availability of the pharmacist schedule were identified barriers.

Conclusions: The results support the co-located pharmacist model as a way to improve care and collaboration between physicians, patients and community pharmacies. The role of the community pharmacist and the collaborative model with the co-located pharmacist needs to be further explored. A larger pilot of this model in more clinics is needed and has the potential to impact pharmacy education, patient care, and development of interprofessional teams.

Acknowledgement
Some of these results were presented at the Canadian Pharmacy Association Conference on June 3, 2017.

PHARMACY EDUCATION

PP06

Prenatal Antibiotics Exposure and the Risk of Autism Spectrum Disorders: A Population-Based Cohort Study

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Background: Prenatal antibiotic exposure induces changes in infants' gut microbiota composition and is suggested as a possible contributor in the development of autism spectrum disorders (ASD). In this study, we examined the association between prenatal antibiotic exposure and the risk of ASD.

Methods: This was a population-based cohort study of all live births born in Manitoba, Canada between April 1, 1998 and March 31, 2016. We utilized administrative health data from the Manitoba Population Research Data Repository, which captures all encounters with the health system by the provincial population under a universal health system. Exposure was defined as having filled one or more antibiotic prescriptions during pregnancy. The main outcome was ASD diagnosis identified at least once in hospital, physician claims or education special needs funding data. Cox proportional hazards regression, adjusted for potential confounders, was used to estimate the risk of ASD in the overall population and in a discordant siblings' cohort.

Results: Out of the study cohort (n=214,834), 80,750 (37.6%) were exposed to antibiotics prenatally. During a follow-up period of 1,943,612 person-years, 2,965 children received a diagnosis with ASD. Prenatal exposure to antibiotics was associated with a small increase in the risk of ASD (adjusted hazard ratio [aHR] 1.10, 95% CI 1.01 – 1.19). ASD risk estimate did not change significantly in the discordant siblings' cohort (aHR 1.08, 95% CI 0.90 – 1.30), except it was no longer statistically significant.

Conclusions: Our findings indicate that prenatal antibiotic exposure is associated with a small, but probably clinically non-significant increase in the risk of ASD.

PHARMACY EDUCATION

PP07

Healthcare providers' views around deprescribing in Nova Scotia

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Study objective: To describe the knowledge, attitudes, beliefs, and behaviours toward deprescribing of primary care providers (family physicians, nurse practitioners, and pharmacists) in Nova Scotia.

Methods: A qualitative study was conducted utilizing interviews and focus groups. Nine one-on-one interviews (3 per profession) and three uniprofessional focus groups with 3 to 4 members of each profession have been held. One interprofessional focus group will also be completed. Each interview and focus group was audio recorded and transcribed verbatim. For the preliminary analysis, four team members reviewed transcripts to identify preliminary codes using the domains of the Theoretical Domains Framework version 2 (TDF(v2)) as the coding framework. Coding was completed by the team and emergent themes were determined using a qualitative data analysis conducted through an iterative process using thematic analysis.

Results: Four TDF(v2) themes have emerged during preliminary coding: 1) Social Influences; 2) Beliefs about Capabilities; 3) Social/Professional Role and Identity; and 4) Environmental Context and Resources. It is expected that additional themes will emerge during the remaining coding and analysis process and be presented in June 2018.

Conclusions: The results of the completed project are expected to uncover common themes that will help inform the development, implementation, and evaluation of deprescribing strategies.

Previously presented

1. Poster presented by L. Salsbury at College of Pharmacy/NSHA/IWK Student Research Event, Dalhousie University, Halifax, Nova Scotia, October 14, 2017.
2. Poster presented by R. Martin-Misener at North American Primary Care Research Group (NAPCRG) 45th Annual Meeting, Montreal, QC on November 18, 2017.

PHARMACY EDUCATION

PP08

Evaluation of the Quality of Evidence of Natural Health Products Included in Clinical Practice Guidelines for the Treatment of Menopause-related Vasomotor Symptoms

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Objective(s): Clinical Practice Guidelines (CPGs) for menopause are used to guide management. With the safety of hormone therapy for menopause-related vasomotor symptoms (VMS) being questioned, there has been increased interest in, and use of, natural health products (NHPs). The objective of this study was to examine the incorporation and quality of recommendations of NHPs into CPGs for the treatment of menopause-related VMS.

Methods: A literature search for CPGs was conducted using PubMed, EMBASE, TRIP, Web of Science, BMJ Best Practice, and DynaMed Plus and official websites of gynecological and menopausal societies. Title and abstracts were screened and then remaining papers underwent relevance assessment to eliminate those not meeting inclusion criteria (English language; North American; published since 2000; included NHPs). Information regarding NHPs (e.g. product, evidence, recommendation) was extracted. Each CPGs was critically appraised using the AGREE II tool.

Results: The literature search identified 701 unique records. After screening and relevance assessment, 5 CPGs were included in the study. Using the AGREE II tool, Domain 4 "clarity of presentation" scored the highest for all the CPGs. How NHPs were selected to be included in the CPGs was not well articulated. One CPG included only 4 NHPs while one included nineteen; with black cohosh, isoflavones and soy food/extracts included in all the CPGs. Using black cohosh, as an example, all 5 CPGs recommended against its use with one CPG citing only 1 paper and one CPG citing 10 papers to support their recommendation.

Conclusions: Clinical Practice Guidelines included recommendations for the use of NHPs for menopause-related VMS. However, the NHPs included in each CPG varied, and it was not clear how the NHPs that were included were selected. These results suggest that more work needs to be done to ensure that all NHP options for menopause-related VMS are included in CPGs with the evidence supporting their claims.

PHARMACY EDUCATION

PP09

Differentiating how therapeutic information is communicated to patients and practitioners

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Study Objectives: Communication challenges often lead to suboptimal patient outcomes, increased system cost and patients' inability to effectively practice self-care. With expanded scope pharmacists play a key role in educating both patients and other healthcare professionals. While the content offered to both audiences is the same, the specific information selected, the language used and manner of delivery are different. To hone the skill of customizing therapeutic information for different audiences, the instructors of PHARM 127 and 129 collaborated on a patient workshop assignment.

Statement of Methods: For PHARM 127 the focus is conveying information about a self-care topic to a patient audience. This audience needs easy-to-understand information about their condition, expected impacts of self-care measures and instructions for safe use. To build this skill groups create patient workshops on a series of self-care topics.

For PHARM 129 that same content is targeted at pharmacists. This audience requires technical information, evidence and the background information they can re-package for patients. Credibility hinges on an ability to convey comprehensive information succinctly. Formatting the information in a way that puts everything in a single, short document is highly valued as is the use of respected sources. To build this skill, groups prepare 2-page fact sheets for pharmacists. Assignments are coordinated between the two courses, underscoring the importance of customizing content by audience.

Summary of Results: In its fifth year, the assignment continues to evolve. Based on student feedback this year's iteration is more explicit describing assignment requirements and the complementary, though differing, goals of the two courses. Using the information simultaneously for different audiences reinforces that both self-care knowledge and communication skill are critical factors in determining a pharmacist's success.

Statement of Conclusions: Continuous improvement has resulted in an assignment that is more direct and which helps first year students understand the importance of translating their knowledge for different audiences.

PHARMACY EDUCATION

PP10

Enhancing Eye Care Through Interprofessional Collaboration – A joint pharmacist/optometrist initiative

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UW School of Optometry & Vision Science

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Study Objectives: In North America, collaboration between pharmacists and optometrists is inconsistent, despite a significant overlap in patient concerns. A team of optometrists and pharmacists from UW developed an interactive online continuing education program to facilitate interprofessional collaboration between the two groups while highlighting their unique and overlapping spheres of knowledge.

Statement of Methods: Four multimedia modules were produced for pharmacists, optometrists and optometric assistants. Content was identified from emerging issues in optometry and previously published pharmacist needs assessments.[1] The Canadian Interprofessional Health Collaborative competency framework[2] was applied to content areas of common interest – complications in contact lens wearers, management of dry eye disease and contact lens systems. Clinical insights from practitioner reviewers were included. Instructional design guidance and pre-launch usability testing was provided by UW Centre for Extended Learning[3].

Summary of Results: The completed program encompasses approximately four hours of content including profession-specific perspectives; knowledge and competencies related to ocular needs and treatment options for several conditions; and profession-specific roles in addressing patient needs and opportunities for communication, collaboration and referral. The program has been submitted for accreditation to pharmacist and optometrist organizations.

Statement of Conclusions: An interprofessional approach to continuing professional development can produce a credible program appealing to multiple health profession groups, allowing each to maintain competence in their respective disciplines while encouraging increased collaboration.

References

1. Kebodeaux C, Grise WM, Hudspeth B et al. Chain community pharmacists' willingness, attitude and barriers in providing self-care medication and supplement recommendations. SelfCare. http://selfcarejournal.com/article/chain-community-pharmacists-willingness-attitudes-and-barriers-in-providing-self-care-medication-and-supplement-recommendations/. Accessed January 29, 2018.
2. Canadian Interprofessional Health Collaborative (CIHC). *A National Interprofessional Competency Framework;* 2010. Available at: https://www.cihc.ca/files/CIHC_IPCompetencies_Feb1210.pdf. Accessed January 26, 2018.
3. Pantazi F, Killeen RM. Opioid Education Partnership: From Blueprint to Practice, Building Opioid Education for Physicians and Pharmacists. Oral presentation at Canadian Association for University Continuing Education conference. Waterloo, ON Canada. June 2, 2016.

PHARMACY EDUCATION

PP11

Monitoring and Managing Medication Adherence in Community Pharmacies

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Background: Community pharmacists have direct access to prescription refills information and have frequent interactions with their patients. Therefore, pharmacists are in the best position to promote optimal medication use.

Objectives: To describe the practices used by community pharmacists in Quebec to identify non-adherent patients, monitor medication use, and intervene to promote optimal medication adherence.

Methods: A cross-sectional survey was published online through different platforms including a Facebook pharmacists group, the electronic newsletter of the Quebec Order of Pharmacist (*La Dépêche*), and the forum of a pharmacy networking and research infrastructure (*Réseau STAT).* Furthermore, emails were sent to the supervising pharmacists of pharmacy interns of two universities. The survey was separated into three sections: participants characteristics, methods to identify non-adherent patients and to monitor medication use, and interventions to promote optimal adherence. We conducted a statistical descriptive analysis on the responses collected.

Results: A total of 342 community pharmacists completed the survey. Participants were mainly women (71.6%), staff pharmacists (56.7%), aged 30 to 39 years old (34.2%) and worked in pharmacies located in urban areas (65.2%). The most common method to identify non-adherent patients was by verifying the gaps between prescription refills (98.8%), while the most common intervention was patient counselling (82.5%). The most common barriers to the identification of non-adherent patients are the lack of time (73.1%) and the lack of information on the medication prescriptions (65.8%), while the most common barriers to the intervention are the anticipation of the negative attitude of the patient (91.2%) and the lack of time (64.0%).

Conclusions: The lack of time is a frequent challenge to effectively monitor and manage patients with low level of adherence in community pharmacies. Quick and effective electronic tools that provide interpretable information based on prescription refills could help pharmacists for the monitoring of and the interventions related to medication adherence.

PHARMACY EDUCATION

PP12

Analysis of medication incidents associated with patient harm in New Brunswick using the Medication Safety Culture Indicator Matrix

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Objectives: Medication Safety Culture Indicator Matrix (MedSCIM) is a tool developed by the Institute for Safe Medication Practices Canada (ISMP Canada) to assess patient safety culture within a healthcare setting using the narrative information in medication incident reports as an indicator. The objective of this study was to use MedSCIM to analyze medication incidents associated with patient harm in New Brunswick and to describe recommendations to advance safe medication use.

Methods: Sixty-nine incidents associated with patient harm anonymously reported by community pharmacy professionals from July 2015 to December 2017 were included in this analysis. Using MedSCIM, we performed descriptive statistics and exploratory data analysis on the incidents.

Results: Based on MedSCIM where maturity of patient safety culture can be determined as "A" (generative) to "D" (pathological), 19 (27.5% of 69) were scored as "1A" incidents (where 1 = fully completed report; A = incident resulted in a "generative" response, where strategies were implemented to prevent future incidents), and 15 (21.7% of 69) were "2C" incidents (where 2 = semi-completed report; D = incident resulted in a "pathological" response, where one person was singled out, and blamed for the incident). Our assessment identified that majority of the "pathological" incidents often involved relief pharmacy professionals; and high-alert medications (e.g. methadone and insulin) were frequently associated with harm incidents.

Conclusions: Current patient safety culture of community pharmacies in New Brunswick derived from our MedSCIM assessment indicated that embracing an environment of open communication, mutual trust and respect among the pharmacy team and other healthcare professionals may improve patient/medication safety. Involving patients in safety initiatives can improve patients' understanding and awareness of their medication therapy. Learning and striving for a "generative" safety culture in a healthcare setting can ultimately lead to optimization of patient outcomes.

PHARMACY EDUCATION

PP13

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

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

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

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

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

Encore Presentation
This poster has been presented at the Professional Practice Conference on February 4th, 2018, in Toronto.

PHARMACY EDUCATION

PP14

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

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

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

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

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

Encore Presentation
This poster has been presented at the Professional Practice Conference on February 6th, 2018, in Toronto; and at the ASHP Midyear Meeting on December 5th, 2017, in Orlando.

PHARMACY EDUCATION

PP15

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

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

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

Results: A total of 131, 031 QREs were anonymously reported by 301 pharmacies in Nova Scotia to a third-party national medication safety organization. 74.87% (98, 097) was medication-related QREs. Overall, 82.05% (80, 488) of reported medication-related QREs did not reach the patient (i.e. near misses) and only 0.95% (928) resulted in harm. Reports of incorrect dose/frequency (25.58%; 25, 089), incorrect quantity (20.00%; 19, 619), and incorrect drug (14.22%; 13, 951) were most common. Pharmacists discovered the majority of medication-related QREs (75.17%; 73, 739). Order entry was the most frequently reported medication system stage for error occurrence, followed by prescription preparation/dispensing, and prescribing. The most reported medications were levothyroxine sodium, amoxicillin, and rosuvastatin. Medications with the highest proportion of QREs with harm were methadone, risperidone, and warfarin.

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

Encore Presentation

This poster has been presented at the Professional Practice Conference on February 4th, 2018, in Toronto; and at the ASHP Midyear Meeting on December 4th, 2017, in Orlando.

PHARMACY EDUCATION

PP16

Developing and evaluating a patient decision aid for managing surgical menopause: The story behind the "SheEmpowers" patient decision aid (PDA)

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Objective: To systematically develop and evaluate an evidence-based patient decision aid (PDA) to help women decide on hormone therapy (HT) to manage symptoms of early surgical menopause and long-term risks.

Methods: The PDA development was guided by the Ottawa decision support framework and involved 3 phases: an exploratory phase to identify women decisional needs; a development phase to identify evidence related to surgical menopause and treatment options and draft an initial prototype; and an evaluation phase to evaluate the prototype and elicit views on acceptability and usability in a non-clinical setting. For exploratory and evaluation phases, we recruited women from the Edmonton menopause clinics. We searched Medline, TRIP, Dynamed, and others for evidence to inform the content of the PDA. Data on HT outcome probabilities were evaluated using the Grading of Recommendations Assessment, Development and Evaluation (GRADE). All phases were driven by a multidisplinary group of researchers, clinicians and patient partners to ensure women priorities were met.

Results: Informed by identified needs from the exploratory phase an initial prototype of the PDA was drafted and had 4 components: facts about surgical menopause and HT; HT outcome probabilities to develop realistic expectations; a values clarification section to make trade-offs and clarify values associated with HT; and a component on guidance in decision-making. We anticipate including supplemental information on other reasonable treatment options for women consideration. We are currently reviewing the tool with our stakeholders to improve content and presentation and gain perspectives on tailoring to women's needs. The evaluation of the PDA is still pending.

Conclusion: Through our adopted, systematic, evidence-based and multidisciplinary approach we hope to develop a PDA than can empower women with early surgical menopause when making therapy decisions and offer them the information, resources, and skills to effectively manage decision-making about HT and other options.

PHARMACY EDUCATION

PS01

Retrospective cohort study comparing three HYDRAtion regimens with cisplatin in patients treated in an academic center (HYDRA study)

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Background: Various hydration protocols have been used to mitigate acute kidney injury (AKI) induced by cisplatin. The use of mannitol remains controversial although recent studies suggested that mannitol has a protective effect against cisplatin-induced nephrotoxicity. The aim of this study was to assess the effect of mannitol.

Methods: This is a retrospective observational study including patients who received at least one dose of cisplatin between September 2010 and December 2016 at the Centre Hospitalier de l'Université de Montréal. W compared the risk of all grade AKI between hydration protocols with or without mannitol.

Results: A total of 1821 patients were included of which 658 received mannitol. The risk of all grade cisplatin-associated acute kidney injury was significantly lower for patients in the mannitol group with lymphoma (HR, 0.33; 95% CI, 0.15– 0.75; P=0.0075), gynecologic (HR, 0.50; 95% CI, 0.26– 0.94; P=0.0325), upper gastrointestinal (HR, 0.32, 95% CI, 0.13–0.75; P=0.0086) and urinary tract malignancies (HR, 0.29, 95% CI, 0.12–0.68; P=0.0047). No difference was seen for head and neck (HR, 0.99, 95% CI, 0.65–1.54; P=0.99) and lung cancers (HR, 0.73, 95% CI, 0.51–1.06; P=0.096). For most malignancies, patients receiving cisplatin doses lower than 75 mg/m2 were significantly less likely to develop acute kidney injury when mannitol was used.

Conclusion: Hydration protocols containing mannitol were associated with a significantly lower risk of all grade acute kidney injury compared to hydration alone in patients with lymphomas, gynecologic, upper gastrointestinal and urinary tract malignancies.

This abstract was submitted at the 2018 ASCO annual meeting June 1st-5th, Chicago, USA.

PHARMACY EDUCATION

PS02

External contamination of commercial vials by antineoplastic agents: a literature review

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Background: Traces of antineoplastic drugs are found on many surfaces. Steps should be taken to minimize the exposure of healthcare workers to this contamination to avoid adverse health effects. The sources of this contamination are varied and include spills, preparing and administering drugs and handling patient excreta. The exterior of commercial vials is also frequently contaminated.

Methods: The aim of this study was to review the literature regarding the external contamination of commercial vials by antineoplastic drugs. A PubMed search from 01-01-1990 to 31-01-2018 was performed with the terms: « antineoplastic agents », « environmental monitoring », « drug packaging », « vials » and « contamination ». Articles were selected based on titles and abstracts. Articles that presented results on the external contamination of commercial vials were included and data was extracted by a research assistant.

Results: Sixteen articles were identified from nine countries (Australie (n=1), Belgium (n=1), Canada (n=4), France (n=1), Germany (n=2), Japan (n=2), Sweden (n=2), Switzerland (n=1), United States (n=1), United Kingdom (n=1). A total of 2733 vials were sampled from 28 manufacturers. Traces were found on 82.8% (2081/2513) of vials: carboplatin (n=176, < than the limit of detection (LOD)-1630 ng/vials), cisplatin (n=226, <LOD-63,4 ng/vials), cyclophosphamide (n=401, <LOD-8782 ng/vials), cytarabin (n=4, <LOD-32.35 ng/vials), docetaxel (n=33, <LOD-366 ng/vials), doxorubicin (n=73, <LOD-29 ng/vials), etoposide (n=200, <LOD-740 ng/vials), fluorouracil (n=387, <LOD-18 100 ng/vials), ifosfamide (n=251, <LOD-1705 ng/vials), methotrexate (n=9, <LOD-1.74 ng/vials).Traces were reported on different type of vials including glass, plastic with protective sheathing (ND-236 ng/vial) versus vials with protective sheathing (ND-236 ng/vials).

Conclusion: This literature review showed that the exterior of the majority of commercial antineoplastic vials was contaminated. This source of contamination should be taken seriously as it can potentially cross-contaminate other surfaces and increase the risk of workers exposure. Manufacturers should limit this contamination. Centers are also encouraged to clean the vials upon receipt, before their storage. In addition, personal protection equipment should be worn at all steps of the drug-use process.

PHARMACY EDUCATION

PS03

Pediatric physiology as it relates to the pharmacokinetics of monoclonal antibodies

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Background: Monoclonal antibodies (mAbs) are seeing increasing use in infants for immunology, oncology, infectious disease and hematology. With the same weight-based dose, infants typically receive lower plasma exposures when compared to adults. This review explores the age-dependence of the processes governing mAb disposition.

Results: The fraction of extracellular fluid volume decreases with age and provides larger weight-normalized volumes of distribution in infants. The distribution rate of mAbs from plasma to tissue occurs two to three times faster in infants as they have a larger capillary surface area per unit volume available for plasma protein exchange and a greater proportion of "leaky" tissues, where capillary permeability is highest. Metabolism and elimination within vascular endothelial cells may be increased due to low expression of FcRn – the neonatal salvage receptor – and the relatively high concentration of endogenous IgG competing for FcRn binding after birth. With respect to absorption, a fast rate of lymph flow drives a fast rate of absorption after extravascular administration.

Conclusion: A number of physiologic mechanisms may be responsible together for the unique pharmacokinetic profiles that are seen with mAbs in infants and young children. Further research is required to solidify these preliminary hypotheses and to explore their pharmacodynamic consequences.

Disclosure
A similar abstract was presented on March 23, 2018 at the Annual Meeting for the American Society of Clinical Pharmacology and Therapeutics in Orlando, FL.

PHARMACY EDUCATION

PS04

Azapeptide MPE001, a CD36 ligand protects against photoreceptors degeneration in TLR2-mediated retinal inflammation

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Subretinal inflammation has been shown to play a critical role in retinal degenerative diseases. Mononuclear phagocytes (MP) driven-inflammation involving Toll-like receptors (TLRs) has been postulated to contribute to damage retinal tissues such as photoreceptors. We have recently found that azapeptide MPE001 that binds to scavenger receptor CD36, a cofactor of the TLR2/6 heterodimer complex, exerts an anti-inflammatory activity in a murine model under blue light-induced photooxydative stress with reduced infiltration of activated MP in the subretinal space, preventing photoreceptors death and preserving visual function.

Objectives: of the present work are to document inhibitory effect of MPE001 on TLR2-mediated inflammation on photoreceptors apoptosis, and the downregulation of inflammasome on macrophages.

Methods: Bone marrow-derived macrophages (BMDM) were stimulated with TLR2 agonist with/without MPE001. Conditioned media (CM) were collected 24h after stimulation. Neuroretinal explants were incubated with the BMDM facing photoreceptors or with the CM. After 18h incubation, apoptotic cells were detected by TUNEL assay. CM was incubated with anti-IL-1β neutralizing antibody to show IL-1β effects on photoreceptor apoptosis. MPE001 effect on inflammasome was documented with peritoneal macrophages stimulated for 4h with TLR2 agonist and treated with MPE001. IL-1β levels measured by ELISA and NLRP3-inflammasome expression was determined by western blot.

Results: Pro-inflammatory BMDM induced a significant increase of photoreceptor apoptosis that was blocked by the pretreatment of the neuroretinal explants with MPE-001. CM from TLR2-stimulated BMDM induced a significant increase of photoreceptors apoptosis which was attenuated by MPE001. Neutralizing IL-1β in CM from stimulated BMDM caused a decrease of photoreceptor apoptosis in neuroretinal explant. The activation of NLRP3-inflammasome was reduced by MPE001 with decreased secretion of IL-1β (39-74%) from stimulated peritoneal macrophages.

Conclusion: Targeting TLR co-receptor CD36 with modulator such as MPE001 to mitigate macrophage-driven inflammation is a potential approach for the treatment inflammatory retinal diseases.

PHARMACY EDUCATION

PS05

Alterations in the eicosanoid profile and mitochondrial injury in human ventricular tissue following myocardial infarction

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Purpose: Myocardial infarction (MI) accounts for a significant proportion of death and disability in the ageing population. CYP450 metabolism of the n-6 PUFAs, linoleic acid and arachidonic acid, results in formation of numerous metabolites called eicosanoids, which can be further metabolised by the enzyme soluble epoxide hydrolase (sEH). These metabolites exhibit a wide range of cellular effects including alterations to mitochondrial structure and function, impacting cardiac performance. This study investigated alterations to CYP-derived eicosanoids and mitochondria in heart tissue obtained from individuals who experienced a previous MI.

Methods: Samples were obtained from male/female individuals included in the Human Explanted Heart Program and correlated to non-failing control hearts (NFC) collected from unused transplant donors through the Human Organ Procurement and Exchange Program at the University of Alberta. Ventricular tissues were harvested from patients who had previously experienced a LAD infarct (≥2yrs). Protein expression was determined by immunoblotting. Mitochondrial enzymatic activities were assessed by spectrophotometry while mitochondrial ultrastructure and cristae density were assessed by electron microscopy. A metabolic profile in ventricular tissue was obtained by LCMS/MS.

Results: Marked differences in both LA and AA metabolic profiles were revealed in post-MI tissues. There were significant increases in cardiotoxic metabolites correlating with decreased cardiac function and injury. Interestingly, no significant alterations were observed in CYP isozyme expression but there was a significant increase in both sEH activity and expression in post-MI tissues compared to NFC. Expression of mitochondrial proteins remained unchanged, however enzymatic function declined in postMI tissues compared to NFC correlating with marked disruption in mitochondrial ultrastructure.

Conclusions: These data provide the first evidence demonstrating a marked shift in eicosanoid metabolism in post-MI hearts correlating with mitochondrial structural disruption and decreased mitochondrial function.

PHARMACY EDUCATION

PS06

Patterns and trends of medication use and costs in chronic obstructive pulmonary disease (COPD): a 19-year population-based study

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Background: A wide range of pharmacotherapies are used to relieve symptoms and decrease the rate of exacerbations in COPD. The majority of treatments for COPD were first brought to market decades ago; however, guideline-based recommendations for these treatments have changed in recent years. The impact of such changes on 'real world' drug utilization is not well understood

Objectives: To identify trends from 1997-2015 in (1) dispensed quantities of COPD-related medications according to their main ingredients, (2) the costs of COPD-related medications according to their main ingredients, and (3) the proportion of time patients were dispensed combination inhaler therapies.

Methods: We used administrative databases for the province of British Colombia, Canada from 1997 to 2015 to create a retrospective cohort of patients with COPD using a validated case definition. Costs were directly available within dispensation records and were adjusted to 2015 Canadian dollars ($). We determined the quantity of canisters dispensed with the following main agents: short-acting beta agonists (SABA), long-acting beta agonists (LABA), long-acting muscarinic antagonists (LAMA), short-acting muscarinic antagonists (SAMA), and inhaled corticosteroids (ICS). Combination therapies were defined based on concomitant use of LABA, LAMA and ICS, and were quantified in terms of Medication Possession Ratio (MPR). Secular trends were examined using Poisson regression.

Results: 85,507 patients (average age 68.7, 48.5% female) were followed for an average of 6.1 years. The dispensed quantity of LAMA increased: 9.7% per year (95%CI: 8.2-11.2%), followed by LABA at 7.1% (95%CI: 6.9-7.3%) per year. The costs of medications increased from 1997 to 2015. Per-patient costs of LAMA increased the most at 15.3% (95%CI: 14.9-15.7%) per year and accounted for 20.4% of total medication costs in 2015. In contrast, per-patient costs of single-inhaler SAMA/SABA decreased by 15.4% (95%CI: 15.1-15.8%) per calendar year over the same period. Among combination therapies, the MPR for triple therapy (LAMA+LABA+ICS) increased at the highest rate (16.4%, 95% CI: 16.0-16.8%) per year.