In Canada, pharmacists share similar entry-to-practice requirements and professional obligations. However, since the administration of health care services is a provincial responsibility, pharmacy practice in the hospital setting may vary between provinces. This manuscript seeks to provide a broad overview of existing similarities and differences in hospital pharmacy practice amongst three Canadian provinces, by highlighting examples from the authors' collective work experience and training in Alberta, British Columbia, and Ontario. This is done through a discussion of the impact of differences in regionalization, pharmacy legislation and regulations, technology, drug reimbursement, and education on hospital pharmacy practice. Pharmacists and student pharmacists are encouraged to appreciate the influence of systemic factors upon their practice, and to collaborate on an interprovincial level to advance Canadian pharmacy practice.
Alberta, health care delivery is administered by a single provincial health authority, Alberta Health Services (AHS). In 2009, AHS was subdivided into five geographical “zones.” This move created more regional accountability for some services to reflect differences in demographics and patient care needs across the province, while maintaining centralization of other services such as payroll and health records (12). British Columbia contains six regional health authorities. Of these, Vancouver Coastal Health, Fraser Health, and the Provincial Health Services Authority have consolidated the management of several support services, including pharmacy, to capitalize on their geographic proximity and improve efficiency (13–15). In contrast, Ontario does not have regional health authorities and utilizes another model altogether. Ontario is divided into fourteen Local Health Integration Networks (LHINs), which help to plan and integrate health care resources in their communities. Unlike regional health authorities, LHINs do not have unilateral administrative authority, as individual institutions within each LHIN continue to be governed by their own boards (16).

How does regionalization impact pharmacists? A tangible example is the drug formulary, which includes drugs determined to be safe, effective, and cost-effective for patients and residents. In Ontario, each hospital or hospital network maintains its own formulary (17). However, with regionalization, hospitals must align with a regional formulary. This ensures that patients in the same health region receive consistent and equitable access to drug therapy, regardless of which hospital delivers their care. Other examples include aligning pharmacy systems and technology, drug information resources, institutional guidelines, and clinical pharmacist performance expectations as well as centralizing drug procurement and selected drug distribution services. Despite its potential benefits, regionalization can bring about unexpected challenges, such as encountering incompatible technology platforms, characterizing relative needs and developing a fair and robust formula to determine regional allocation of funding, and limiting the ability of individual institutions to make changes independently (10).

II. Pharmacy Legislation and Regulations

In Canada, pharmacy practice is governed by provincial regulatory authorities and the legislation and regulations that they enact in their provinces. Hospital pharmacy departments must also comply with their provincial equivalent of the “Hospital Act”, which (in general) establishes requirements for hospital operation and oversight. Due to the scope of pharmacy-related legislation, we will limit the number of differences highlighted in this article. Of interest, many provinces have recently implemented legislative and regulatory changes to enable an expanded scope of pharmacy practice (3,18). The different paths taken by each province toward enabling, regulating, and funding these pharmacy services have created a complex and potentially confusing landscape for pharmacists, other health care providers, and patients across Canada.

Alberta was the first province to enable pharmacist administration of selected injections and pharmacist prescribing, which includes emergency prescribing, adapting an existing prescription, and “initiating/managing drug therapy” (3, 19, 20). Pharmacists performing the third type of prescribing can assess patients, implement drug therapy, and order lab tests, and must demonstrate their competency by attaining “additional prescribing authorization” (19). In British Columbia, regulations were passed in 2009 permitting pharmacists to administer selected injections and to renew and adapt prescriptions (21). In October 2012, the Ontario government approved similar regulations allowing pharmacists to renew and adapt prescriptions (excluding therapeutic substitution), demonstrate the use of lancets and inhaled or injectable drugs for educational purposes, administer influenza vaccine, and prescribe selected drugs for smoking cessation (22). Of note, there are important differences in the definitions, limitations, obligations, and included drugs associated with these expanded-scope activities for pharmacists in different provinces.

The majority of these recent changes are focused on community pharmacists, given their potential to broadly enhance patient access to health care services. It is unclear whether legislation permitting pharmacist expanded-scope activities will have a significant impact on hospital pharmacy practice, since many hospital pharmacists already adjust drug therapy, order lab tests, and perform other “expanded-scope services” through medical directives and policies at their specific institution. The advantage of legislative changes is that pharmacists could theoretically provide these services in a greater variety of clinical scenarios, at any institution in the province, and under their own authority. Unfortunately, uptake of expanded scope has been slow among pharmacists (for example, only 155 out of 4,277 practicing registrants in Alberta had additional prescribing authorization by February 29, 2012) and any practice changes to reflect pharmacists’ expanded scope in the hospital setting would likely be overseen by institutional policies (2,23).

In addition to expanding pharmacists’ scope of practice, the evolving movement to regulate pharmacy technicians (currently active in Alberta, British Columbia, and Ontario) may impact hospital pharmacy practice (4). Just as many hospital pharmacists already perform expanded-scope activities, many hospital pharmacy technicians
routinely perform drug distribution duties without direct pharmacist supervision. Therefore, regulation may not significantly impact the role hospital pharmacy technicians play in drug distribution, but it will allow them to be accountable for their work. The more interesting question is whether regulation will increase the extent to which “clinical pharmacy support technicians” collaborate with pharmacists to provide patient care. The literature describes multiple examples of trained pharmacy technicians providing clinical support in a variety of settings (24). At Royal Columbian Hospital, a tertiary care centre in British Columbia, clinical pharmacy support technicians assist pharmacists in the Intensive Care Unit (ICU) with patient triage, data collection, troubleshooting, and other duties, which enables ICU pharmacists to be more efficient and more available to perform cognitive-based activities (25). Other authors describe the commencement of hospital pharmacy technicians taking best possible medication histories (BPMHs), which may enable pharmacists to identify and address drug therapy problems more efficiently (26,27). Ultimately, the impact of pharmacy technician regulation in the hospital setting will likely be determined by how scarce human resources (pharmacists, registered pharmacy technicians, and pharmacy assistants) are deployed at individual institutions to perform distribution and clinical duties.

III. Pharmacy Technology

Recent advances in technology are revolutionizing pharmacy practice in the hospital setting. Depending on their practice area and site, hospital pharmacists may work with automated unit-dose (AUD) and barcoding systems, automated dispensing cabinets (ADCs), computerized physician-order entry (CPOE), electronic medication administration records (MARs), and clinical decision support systems (CDSS). However, the most significant difference between provincial systems in pharmacy technology is in the implementation of electronic health records (EHRs).

The availability of province-wide electronic drug databases substantially affects the practice of hospital pharmacists, especially at interfaces of care, such as hospital admission and discharge. In Alberta, the Netcare system enables pharmacists to access dispensed Schedule I and II medications, lab values, imaging, and hospital discharge summaries across the province. British Columbia has PharmaNet, a similar system for dispensed prescription medications, as well as separate tools for accessing lab values, imaging, and hospital discharge summaries (these tools are not fully connected across the province). Medication profiles downloaded from these provincial databases can be used to ensure appropriate continuation of therapy in hospital and to identify drug-related adverse events and medication errors. However, it is equally important to recognize their limitations, including that non-prescription medications may not be recorded and that patients may be non-adherent or taking medications differently than prescribed. Hence, provincial databases are usually an excellent starting point for medication reconciliation, but attaining a BPMH still requires speaking to patients and/or their caregivers and consulting available health records.

In Ontario, there is no complete medication database that includes all residents. The most comparable tool is the Ontario Drug Benefit Drug Profile Viewer (ODB DPV), which is incomplete as not all residents of Ontario have ODB coverage and the tool only records medications covered by ODB. In addition, the DPV does not record the directions for use; for example, it would not be clear whether a patient was taking four tablets once a day or two tablets twice a day. Due to these limitations, medication reconciliation is more time-consuming and may require several additional steps, such as the pharmacist contacting the patient’s community pharmacy for a medication profile.

IV. Drug Reimbursement

A significant part of a pharmacist’s role is ensuring accessibility to drug therapy, which often includes applying for outpatient drug coverage. In order to limit public drug expenditures, governments have policies that establish the population that is covered, what drugs are covered, and the extent of reimbursement, and may set additional criteria for coverage of high-cost drugs. However, there are substantial differences between provinces, which may affect pharmacists’ drug therapy decisions and how they help patients navigate the health care system.

In general, the first step is to identify if a patient is eligible for drug coverage under a public program. In British Columbia, all eligible residents are automatically covered (upon registration) by Pharmacare, whereas enrolment in the government-sponsored drug plan is optional for residents in Alberta. In Ontario, ODB automatically covers select populations, including individuals above the age of 65 years, social assistance recipients, and residents at long-term care facilities. Patients in Ontario who are taking high-cost medications, but are not otherwise covered by ODB, may apply for catastrophic drug coverage through the Trillium program, where patients pay a quarterly deductible based on their income and receive ODB drug coverage benefits. Furthermore, these provincial plans vary with respect to their financial details, such as deductibles and patient co-payments.

Secondly, pharmacists may need to provide documentation that patients meet criteria for reimbursement for selected drugs. Even within each province, there may be varying procedures for
different drugs – some are automatically covered if prescribed by a particular type of specialist, some have clinical criteria that must be met, and others may require a patient-specific application and review prior to approval. This may result in varying public drug coverage of specialized and high-cost medications. For example, Cancer Care Ontario was recently compelled to change its clinical criteria for coverage of trastuzumab, after a woman with HER-2 positive breast cancer was denied access to the drug because her tumour was below the size threshold set by the agency (28). However, if she had been living in British Columbia, Alberta or Saskatchewan, trastuzumab would have been covered, highlighting the inequality of access to drugs for comparable patients within Canada (29).

Another example is public coverage of antiretrovirals, which are used to treat human immunodeficiency virus (HIV) infection and are prohibitively expensive (about $1,000 a month) for anyone without public or private reimbursement. In Alberta and British Columbia, antiretroviral drugs (with some limitations) are fully covered for all eligible residents (30). However, in Ontario, not all eligible residents have automatic ODB coverage, and thus not all patients have automatic public coverage for antiretrovirals. If patients in Ontario do not have adequate private drug coverage, pharmacists may need to help patients apply to the Trillium program or for social assistance, which confers ODB benefits. As a last resort, pharmacists may request and coordinate compassionate supplies from drug manufacturers as well.

V. Pharmacy Education

In Canada, formal pharmacy education is provided by ten accredited Faculties or Schools of Pharmacy, which span eight provinces. All students graduating from these programs sit the same Canadian licensing exam at the end of their training, prior to entry into practice. However, differences exist between and within curricula, especially with regard to the practical courses and experiential rotations. The provision of pharmacy education has important implications for students, preceptors, and hospital practice sites, since student pharmacists receive experiential training in the hospital setting and because many hospital pharmacists teach as professors, preceptors, and lab or case-based learning facilitators.

Opportunities for undergraduate student training as part of structured, experiential training in the hospital setting vary between pharmacy schools. At the University of British Columbia (UBC), students receive a 4 hour orientation in first year and 4 weeks of training in fourth year in an institutional setting (hospital, ambulatory clinic or long-term care facility), compared to 2 weeks in second year and 6 to 8 weeks in fourth year at the University of Alberta (UofA) and 12 hours in second year and 8 weeks in fourth year at the University of Toronto (UofT). Several faculties, such as that of UofT, also provide students with hospital-focused electives. However, in order to prepare student pharmacists to work within innovative and expanded scopes of practice in the future, many pharmacy schools are currently refocusing their curricula to incorporate more practical training in clinical settings. Therefore, even pharmacists who attended the same school, but during different years, may have had different levels of exposure to hospital practice as undergraduate students.

Many pharmacists pursue formal education and practical training beyond an undergraduate degree. UBC, UofT, and UofA each offer unique Doctor of Pharmacy (PharmD) programs, so the majority of PharmD experiential training in Canada is centred in those provinces. Several faculties also plan to introduce entry-level PharmD programs. In addition, opportunities to attain a hospital pharmacy practice residency vary, as they are coordinated by individual hospitals or hospital networks rather than by pharmacy schools in each province. For example, there are approximately 9 accredited residency positions in Alberta, 25–30 in British Columbia and 32 in Ontario (31). The Hospital Pharmacy in Canada survey (2009/2010) reported that the percentage of hospital pharmacists with a Canadian Society of Hospital Pharmacists (CSHP) accredited residency ranged from 70% in Quebec to 8% in Manitoba (3). Furthermore, several provinces, including Ontario and Alberta, require that pharmacy graduates complete an internship prior to registration as a full pharmacist. Thus, hospitals in different provinces may have different distributions of student pharmacists. Preceptors may need to spend more time with undergraduate students to provide an overview of hospital practice, while interns, residents and PharmD students may be more independent learners and better able to contribute to the practice site through clinical, research and teaching activities.

Differences in pharmacy education do not only affect the educational backgrounds of hospital pharmacists. Pharmacists that have attended the same school are likely to share a similar approach to pharmaceutical care and be familiar with the same regional pharmacy leaders and experts. From a broader perspective, pharmacy education also includes informal learning opportunities that allow practicing pharmacists to build regional networks to facilitate the sharing of knowledge and best practices. Since occasions to connect with pharmacists in other provinces may be infrequent, pharmacists are likely to develop a sense of

1 For the graduating classes of 2012 from UBC, UofA and UofT.
community with others within their local region or province.

Discussion

It is apparent that there are key differences between provincial health systems that affect hospital pharmacy practice. These differences are particularly noticeable for pharmacists that have worked in more than one province. In addition to having to learn the system at their local site, pharmacists that are new to a province will encounter a different structure in the public health system, different technology, and a different community of pharmacists. Their success in transitioning between provinces suggests that pharmacists have a remarkable ability to adapt and apply their knowledge and skills in a variety of settings.

In fact, there is an enormous diversity in how hospital pharmacists practice across Canada. For example, hospital pharmacists may work in teaching hospitals, community hospitals, or outpatient clinics, may have different roles and responsibilities, may work with advanced pharmacy technology, and may be integrated with interdisciplinary health teams to varying extents. While these topics have a significant impact on practice, they are more dependent upon how pharmacy resources are invested and structured between and within individual institutions. In all provinces, hospital pharmacists have similar responsibilities, including coordinating drug distribution and providing pharmaceutical care. Therefore, from a broad perspective, there are few, but still significant, ways in which hospital pharmacy practice differs between provinces.

Given that all pharmacists have a common goal of ensuring optimal drug therapy outcomes for our patients, we would benefit from improving communication and knowledge translation across our provincial borders. There is much we can learn from our neighbours, even by simply appreciating how different pharmacy practice can be. In particular, the sharing of best practices and collaboration in national initiatives has the potential to engage pharmacists across Canada, and improve health care quality without “re-inventing the wheel” (32). For example, pharmacists working on integrating medication reconciliation processes at their individual institutions collaborated through Safer Healthcare Now!, a national program focused on improving patient safety, and communicated using the Communities of Practice, a web-based forum for discussion and document sharing (33). At the national level, the Canadian Society of Hospital Pharmacists (CSHP) is leading efforts to promote excellence in hospital pharmacy practice through CSHP 2015, a quality care initiative to advance the safe, effective and evidence-based use of drug therapy and pharmacists’ contributions to public health initiatives (34). Similarly, the Canadian Pharmacists Association (CPhA) is leading the Blueprint for Pharmacy, a landmark effort to build the future of pharmacy in Canada through engagement of and collaboration between pharmacists and pharmacy organizations (35).

What can be done to foster interprovincial collaboration at the student level? Student pharmacists can actively participate in national pharmacy organizations, such as CPhA, CSHP, and the Canadian Society of Pharmacy Students and Interns (CAPSI), and seek to network with students and pharmacists from other provinces. These opportunities will help develop mutual awareness of pharmacy education and practice elsewhere, provide a forum to share ideas and collaborate on initiatives, and foster a greater sense of unity within the Canadian pharmacy community. Pharmacy student leaders can advocate for faculty and industry funding or lead fundraising events in order to help alleviate financial barriers associated with interprovincial travel. And finally, student pharmacists can proactively express their opinions on pharmacy education and practice issues through unique avenues that are accessible to students and pharmacists elsewhere, such as through a student-run and open-access pharmacy journal.

There are important limitations to this article, namely its scope and focus. The intent was to describe the most important ways in which pharmacy practice might be similar or different between provincial health care systems by highlighting examples from the authors’ collective experiences as hospital pharmacists that have worked in more than one province. However, only three provinces were discussed, and the authors did not contact other pharmacists in order to attain a wider array of perspectives. Therefore, all relevant differences in hospital pharmacy practice between Canadian provinces could not be captured, and this article does not presume to be a comprehensive review of this topic. In addition, differences between provinces that primarily affect pharmacy practice in the community or industry were not considered and, in the future, an appraisal of their impact would be a worthwhile pursuit.

Conclusion

There are important differences between provincial health systems that affect how hospital pharmacists learn, work, and navigate the health care system. However, regardless of location, hospital pharmacists share similar overarching goals, responsibilities, and challenges. Canadian pharmacists and student pharmacists would benefit from increased awareness of practice issues in other provinces and from participating in collaborative initiatives that span multiple provinces.
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