



A Review of Pharmacy Services in Canada and the Health and Economic Evidence

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Table of Contents

Executive Summary	3
Chapter 1: Introduction.....	4
Chapter 2: The Evolution and Current State of Pharmacy Services	6
Chapter 3: Stakeholder Perspectives on Optimizing Pharmacy Services	11
Key Challenges and Opportunities	12
1. Operating Environments	12
2. Evidence of Value and Impact.....	14
3. The Pharmacy Profession	15
4. Legislation and Regulation	16
5. Reimbursement/Remuneration Models	17
6. Public Perceptions	21
7. Pharmacy in Practice	21
Public Payer Priorities	24
Chapter 4: Evidence of Pharmacy Services' Health and Economic Impact	26
Smoking (Tobacco) Cessation.....	28
Influenza Vaccination	35
Other Vaccinations	37
Cardiovascular Disease and Related Conditions	40
Asthma and COPD.....	54
Neuropsychological (Brain) Health	56
Medication Review and Management.....	57
Minor Ailments Assessment and Prescribing	61
Key Challenges and Opportunities	68
Chapter 5: Identifying Priorities for Measuring Economic Impact.....	71
Convergence of Evidence and Stakeholder Priorities for Measuring Economic Impact.....	71
Criteria for Measuring Economic Impact of Pharmacy Services.....	73
Chapter 6: Final Thoughts.....	79
Summary of Findings.....	79
Next Steps.....	80
Acknowledgements.....	81
Appendix A: Interview Guide and Questions	82
Appendix B: Pharmacists' Expanded Scope of Practice.....	84
Appendix C: Bibliography	85

Executive Summary

To mitigate high and increasing health care budgets and the fast-growing demand for affordable and convenient health care services, decision-makers in Canada are seeking to improve health outcomes while reducing the burden on the public health care system. Pharmacists are an integral part of this process, and the scope of pharmacy practice has expanded in recent years as a result, although each province and territory has taken a different approach to optimize expanded scope for better health and value. From minor issues to complex conditions, pharmacists today are providing more services and care to help meet the demand for convenient, accessible, and cost-efficient health care services. They are an important part of the solution, yet the evidence regarding their ability to help meet these goals is often not well articulated.

This three-part research series examines expanded scope of pharmacy services within a community pharmacy setting, as well as the impact of these services on the health and well-being of Canadians and the sustainability of our health care system. It highlights both current evidence and potential opportunities to increase health and sustainability outcomes—outcomes that are shaped by a number of challenges and opportunities, including operating environments, value and impact assessments, professional changes, legislation and regulation, payment mechanisms, public perceptions, and professional implications.

Government stakeholders have clear priorities:

- Achieve health system savings by reducing wait time pressures and the costs associated with unnecessary doctor and emergency room visits.
- Leverage the core skill set of pharmacists with a focus on safety, adherence, compliance, and appropriate medication use.
- Improve health outcomes through chronic disease management, health promotion, and prevention.
- Serve high-needs/high-cost population.
- Explore approaches to better leverage both the skill set of pharmacists and the services of community pharmacies in primary care.

This report aims to help decision-makers understand the value and potential to scale up key services that community pharmacists provide, including smoking (tobacco) cessation, influenza vaccination, cardiovascular disease and related conditions, asthma and COPD (chronic obstructive pulmonary disease), neuropsychological (brain) health, medication review and management, and minor ailments assessment and prescribing. It highlights the convergence between high-interest priority areas identified by government stakeholders and the health and economic evidence of community pharmacy practice. This convergence will guide the next phase of the research series which will identify opportunities for scaling up or expanding pharmacy scope of practice and model select services for which the opportunity exists to improve both health impacts and overall system sustainability.

Chapter 1: Introduction

Chapter Summary

- The scope of pharmacy practice has expanded in recent years.
 - The evidence regarding the overall impact, potential to improve health outcomes, and reduce the burden on Canada's health care system is still not well understood.
 - This research series examines the impact that expanded pharmacy services in a community pharmacy setting are having on both the health and well-being of Canadians and the sustainability of the health care system.
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Pharmacists have and continue to be an integral part of the health care and services provided to Canadians. From the perspective of the community pharmacy, there is a greater opportunity to shift practice to a more patient-centred model to generate additional value for the health care system. As a result, in more recent years, the services and care that pharmacists can provide have expanded from the traditional role of dispensing medications,¹ and as a consequence, Canadians are receiving more care from their local pharmacies. The nature of this care varies by province/territory (P/T) and by individual needs, but can include services like vaccinations, treatment for minor ailments, or in-depth consultation on health and medication needs and care. While the addition of these services within a community pharmacy can increase convenience and access, the evidence regarding impact and potential to improve health outcomes, and reduce the economic burden on the Canadian health care system is still not well known or articulated.

The primary objective of this research series is to examine the expanded scope² of pharmacy services within a community pharmacy setting, along with the real and potential impact those services have on the health and well-being of Canadians and the sustainability of our health care system.

The findings will be presented in a series of three reports examining:

1. the current landscape of expanded pharmacy services in community settings
2. the health and economic impact of expanded or scaled-up³ pharmacy services in community settings
3. recommendations for optimizing expanded pharmacy services in community settings.

This first report provides an overview of the expanded scope of pharmacy services that have occurred over recent years (Chapter 2), including insights into the challenges and opportunities that have arisen as stakeholders⁴ work to optimize the use of these services in community settings (Chapter 3). The evidence pertaining to the health and economic impacts of the expanded scope of pharmacy services domestically and internationally is also included, along with a discussion of services, models, or approaches that show promise for realizing these impacts (Chapter 4). This report also attempts to converge stakeholder priorities and the

¹ Canadian Pharmacists Association, *Environmental Scan*.

² Scope of practice or service refers to the activities the practitioners of a profession are educated and authorized to perform. Nelson and Turnbull, "Optimizing Scopes of Practice."

³ Scaling up an intervention or program involves taking one that has demonstrated efficacy, and hopefully effectiveness, on a small scale and expanding it to reach a greater proportion of the eligible population while retaining effectiveness. Milat and others, "The Concept of Scalability."

⁴ Pharmacists, P/T governments, regulators, associations, and academics.

evidence in order to provide guidance for the selection of pharmacy services for the forthcoming health and economic modelling study that will be released as the second report in this series (Chapter 5). Finally, this report will provide some direction for the subsequent modelling study with the presentation of an approach to prioritizing pharmacy services for health and economic evaluation (Chapter 6).

The findings of this report were informed by two primary activities: key informant interviews and a review of research and grey literature. The project work was also informed by an advisory committee composed of profession and industry that provided expertise at various stages throughout the research process, including the initial project design, the development and validation of the interview guide and questions, and the key findings.

For the purposes of this report, we focused on services that are delivered by the pharmacist in a community pharmacy setting in Canada. In some cases, we also discuss pharmacy models and services in other comparable countries such as the United Kingdom and the United States. We did not examine services provided by other professionals within a community pharmacy setting, nor did we include patients or other health care professionals as part of the key informants interviewed in this report. Although the target audience for this report is predominately the pharmacy profession, regulators, and public payers, we recognize that there are important implications for other health and health care system stakeholders.

Chapter 2: The Evolution and Current State of Pharmacy Services

Chapter Summary

- A number of factors impact the expanded scope of pharmacy practice, including regulatory and legislative changes; training, education, and certification; communication; and funding models.
 - Pharmacists' scope of practice varies across Canadian provinces and territories as each jurisdiction has its own policies according to these factors.
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Pharmacists may contribute to a more effective and efficient health care system if they are supported to work to optimum scope as opposed to full scope of practice. The role of pharmacists and community pharmacies in Canadian health care has changed in recent years and will undoubtedly evolve further in the coming years. Traditionally, community pharmacists have been seen by the public being behind a counter filling prescriptions, providing information about those medications, consulting with physicians, and answering customer questions about products and remedies on the store shelves. Over the past decade or so, there have been significant changes to pharmacy practices with more pharmacists moving out from behind the counter to take a more proactive role in providing health services to their clients. (See “What Are Professional and Pharmacy Scopes of Practice?”) These changes may reflect a growing interest in the role of pharmacists and pharmacy in health care system sustainability and patient preferences.⁵

What Are Professional and Pharmacy Scopes of Practice?

Discussions about optimizing the scope of practice among health professionals, particularly as it pertains to collaborative care, have a long legacy in Canada.⁶ Evidence-based collaborative models have developed in areas such as diabetes care in primary care settings,⁷ but not at a pace or with the type of impact sought by policy-makers, funders, and Canadians.

In recognition of the importance of collaborative care in transforming health care, the Canadian Academy of Health Sciences appointed an expert panel to report on the evidence around the scopes of practice that could support innovative models of health care. The panel's report, *Optimizing Scopes of Practice, New Models of Care for a New Health Care System*, clarifies key concepts regarding the expanded scope of pharmacists.⁸ Specifically:

- The scope of practice for a professional includes the activities he or she is educated and authorized to perform.

⁵ Tinelli, Ryan, and Bond, “Patients’ Preferences.”

⁶ For example, the Primary Health Care Transition Fund project on interdisciplinary collaboration. See EICP Steering Committee, “Final and Interim Documents.”

⁷ Dinh, *Briefing 3*.

⁸ Nelson and Turnbull, “Optimizing Scopes of Practice.”

- In some parts of Canada, professions such as nursing and pharmacy have an expanded scope of practice which allows them to undertake additional activities that have not been part of their usual basket of services.
- New types of practitioners, such as pharmacy technicians, are providing services that impact existing service delivery models, including the services required of other professionals.
- In the real world, the actual scope of practice of professionals is shaped by where they work (e.g., in a hospital or in a community setting), who they work with, the needs of the patients they service, and the requirements dictated by their employer or workplace circumstances.⁹

A key insight from the panel's report is the distinction made between full and optimal scope. It noted that the most efficient, cost-effective system is not necessarily predicated on all professionals working to full scope in all contexts. Instead, it suggested "working to 'optimal scope' means achieving the most effective configuration of professional roles, determined by other health care professionals' relative competencies."¹⁰

Thus, at least for services funded through public payers (P/T governments, regional or local authorities), efforts to optimize the expanded scope of practice of pharmacists in community settings must be positioned within the complement of other health providers in that setting (particularly when there is overlapping scope with others).

In view of the additions to scope of practice in recent years for professionals like pharmacists and nurses, public payers appear to be extremely well positioned to garner the best value from the public dollars they invest in health services. Due to the overlapping scope for some health services, such as immunizations, P/T governments are in a position to increase public access for targeted services, and get the best health outcome from those services in the most cost-effective way. However, political, fiscal, and professional pressures among all relevant stakeholders are barriers to change.

This potential is driven by a number of factors, including regulatory and legislative changes allowing for an expanded scope of practice; training, education, and certification to develop the skills and competency for expanded practice; communication with the public and other health professionals about practice and service changes; and funding models (public and private) for the services. Each province and territory has adopted its own approach to these various factors. Appendix B contains a current chart prepared by the Canadian Pharmacists Association summarizing the expanded scope of practice of pharmacists across the provinces and territories. While the chart does not capture all of the nuances in the various jurisdictions, it does provide a starting point for discussion.¹¹ Jurisdictions also vary in their approach to implementing changes. Some have intentionally chosen to implement changes through smaller increments while others have adopted large-scale change relatively quickly.

The following section summarizes key areas where pharmacy scope of practice has been expanded in Canada.¹² Pharmacists in different jurisdictions have prescriptive authority to

⁹ Canadian Nurses Association, *The Practice of Nursing*.

¹⁰ Nelson and Turnbull, "Optimizing Scopes of Practice."

¹¹ The Canadian Foundation for Pharmacy's summary chart of services and fees is another source that some interviewees preferred. Canadian Foundation for Pharmacy, *2015 Changing Face of Pharmacy*.

¹² Definitions for the following sets of services are taken from two Canadian Pharmacists Association reports: *Environmental Scan* and *Pharmacists' Medication Management Services*.

adapt, manage, and initiate Schedule I drugs.¹³ Expanded scope has enabled pharmacists in many jurisdictions to:

- **Renew/Extend Prescriptions for Continuity of Care**
To ensure continuity of care, pharmacists can renew a prescription without prior prescriber consent if they send an update to the prescriber. All provinces and the Northwest Territories have enabled this service; however, each province has its own set of regulations regarding the types of drugs/conditions allowed, duration of renewal, and number of renewals allowed per prescription.
- **Change Drug Dosage/Formulation**
To enhance patient outcomes, pharmacists can provide a patient assessment and adapt a prescription to change the dose, formulation, or regimen of the prescription. This is allowed in all provinces.
- **Make Therapeutic Substitutions**
To best suit the needs of the patient, pharmacists can make a therapeutic substitution to another drug, provided the drug falls within the same therapeutic class. Therapeutic substitutions are currently allowed in all provinces except Manitoba, Ontario, and Quebec.
- **Initiate Prescription Drug Therapy**
Pharmacists in Alberta have independent prescriptive authority for *any* Schedule 1 drug, not including controlled drugs and substances, provided they have obtained additional prescribing authorization through the College. Within or under a collaborative practice setting or agreement, pharmacists in New Brunswick, Nova Scotia, Saskatchewan, and Manitoba may also initiate prescriptions (Manitoba also limits this authority to pharmacists with additional authorization through the College). In case of emergency – where there is an immediate need but no existing prescription – pharmacists in Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia, and Prince Edward Island may also initiate Schedule 1 prescription drug therapy (limitations apply).¹⁴
- **Prescribe for Minor Ailments and Smoking Cessation**
Pharmacists in all provinces except British Columbia and Ontario can assess and prescribe Schedule I drug therapy for the treatment of specific minor ailments outlined in jurisdictional legislation/regulation (additional training and/or authorization through the College may apply). All provinces can also provide non-prescription and non-pharmacological counselling and options. Minor ailment conditions that pharmacists are allowed to prescribe for vary across the provinces. Pharmacists in every province except British Columbia and Saskatchewan can also prescribe Schedule I drug therapy for smoking or tobacco cessation (additional training and/or authorization through the College may apply).
- **Administer a Drug by Injection**
For routine injections or immunizations and other preventative measures, pharmacists in most jurisdictions are able to administer a drug or substance by injection, although

¹³ Schedule I drugs are provided to the public by a pharmacist following a diagnosis by a health care professional and which requires a prescription for sale, which is controlled in a regulated environment as defined pharmacy legislation in a given province/territory.

¹⁴ Excluding controlled substances.

jurisdiction-specific regulations apply (e.g., training requirements, age limitations). Pharmacists in Alberta, Saskatchewan, Manitoba, New Brunswick, Newfoundland, and Prince Edward Island have injection authority for most drugs (limitations apply). Pharmacists in these provinces and British Columbia and Nova Scotia have injection authority for vaccines (limitations apply). Ontario pharmacists are currently authorized to inject only the influenza vaccine. Quebec is the only province that does not currently allow pharmacists to administer any drug or vaccine, other than for demonstration/education purposes.

- **Order and Interpret Lab Tests**

For the purpose of medication monitoring, pharmacists in some jurisdictions are authorized to order, receive, and interpret the results of a laboratory screening. Regulations authorizing these activities have passed in Alberta, Manitoba (authority to order tests only), Quebec, and Nova Scotia. Implementation is pending legislation, regulations, standards of practice, and/or education in Saskatchewan, Prince Edward Island, and New Brunswick.

- **Employ Regulated Pharmacy Technicians**

All provinces except Quebec have legislation governing the title of “pharmacy technician” as a new class of health care professional. Pharmacy technicians must either complete a bridging program or graduate from an accredited pharmacy technician program and obtain a certificate of registration through their respective college. Pharmacy technicians in Manitoba are not licensed through the College.

In addition to these areas of expanded scope, pharmacists also provide core medication assessment, review, and care management services, including chronic disease medication management therapy. To increase medication adherence and compliance, avoid harmful interactions, and de-prescribe for unnecessary medications, pharmacists can provide medication consultations and care plans, which may include an assessment, medication reconciliation, resolution of drug-related problems, and a follow-up and monitoring plan. Eligibility requirements (e.g., the minimum number of qualifying medications a patient is taking, specific chronic disease or risk factors) determine the type of medication management or care plan and the number of follow-up consultations for which a patient qualifies.

As this brief summary shows, scope in each jurisdiction differs across provinces and territories in relation to differences in legislation and regulation governing scope; training, education, and certification to develop the skills and competency for expanded practice; communication with the public and other health professionals about practice and service changes; and funding/remuneration models. It is important to note that jurisdictions are also in different stages of services implementation and uptake. For example, although services such as minor ailment assessment/prescribing or laboratory test ordering/interpreting are legislated in some provinces, practical challenges, such as new training and certification requirements, culture and practice changes, and infrastructure gaps,¹⁵ have limited full-scale implementation and uptake by pharmacists and pharmacies. Many factors, including public demand, political will, funding models, and evidence, play a role in decisions to practice to scope or to further expand scope.

The following chapters outline some of the opportunities and challenges that exist in the current landscape of pharmacy practice in Canada based on results from our interviews with key informants from P/T governments, professional associations, regulatory colleges, private

¹⁵ For example, access to electronic health databases.

insurance, and academia. We have identified several common themes and priority areas for further assessment around optimizing pharmacy services.

Chapter 3: Stakeholder Perspectives on Optimizing Pharmacy Services

Chapter Summary

- A variety of perspectives exist on how to best optimize the expanded scope of pharmacy practice, and stakeholder collaboration is crucial to realize meaningful change.
 - Key challenges and opportunities identified by the interviewees include operating environments, value and impact assessments, professional changes, legislation and regulation, payment mechanisms, public perceptions, and professional implications.
 - Top public payer priorities include achieving health system savings, leveraging the core skill set of pharmacists, improving health outcomes, serving the high-needs/high-cost population, and exploring approaches to better leverage the skills of pharmacists in primary care.
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This chapter summarizes the key interview findings, including an assessment of the challenges and opportunities in optimizing pharmacy practice from the respective interview perspectives. See “Eliciting Stakeholder Perspectives on Optimizing Pharmacy Services” for a description of the methodology used in the interview component of this report.

Eliciting Stakeholder Perspectives on Optimizing Pharmacy Services

As noted earlier, the professional practice of pharmacy and services delivered in a community setting has evolved in recent years. In order to validate our understanding of the evolution and current landscape of pharmacy services in Canada and to evaluate the current challenges and opportunities, interviews with key stakeholders were conducted between October and November 2015. A total of 44 individuals from P/T governments, professional associations, regulatory colleges, the private insurance industry, and academia were interviewed.

The interview guide, which was sent to each interviewee before their scheduled interview, is included in Appendix A. Each interview was conducted in English or French over the telephone and lasted approximately one to two hours. Two Conference Board researchers conducted the interviews, with each covering specific geographic areas.

The researchers reviewed the transcripts of the interviews, independently identified themes, and compared the findings for consistency. Due to confidentiality requirements, individual responses and the identity of interviewees are undisclosed in this report; rather, key findings are summarized in aggregate in Chapter 4, as well as throughout the report. These findings were then integrated with the literature review results in Chapter 5.

Optimizing Pharmacy Services: Perspectives and Opportunities

From whose perspective should the optimization of pharmacy services be measured? The end user—patient, client, or customer—may consider convenience, accessibility, expertise, or cost to be priorities. Pharmacists, like other health care providers, provide a basket of services to meet the needs of their clients, within the parameters of their professional standards of practice. Pharmacy owners offer these services in an approach that is reasonable and sustainable within their model of service delivery in the community. Regulatory colleges look to optimize quality and safety, while professional associations consider education, practice, and advocacy issues. P/T government payers seek to optimize the use of all professional health services (pharmacy included) for the best possible health outcomes and user experience, in an approach that is sustainable considering the resources available. Private payers, specifically insurers, similarly look to optimize health outcomes and balance the services offered against other pressures on benefit costs. Both payer groups seek the best value from their investments in services and products, including health, experience, and cost considerations. The latter has received significant emphasis due to the challenging financial environment faced by today's public payers.

Understanding the unique, shared, and sometimes conflicting perspectives on how to optimize the expanded scope of pharmacy practice is essential, and collaboration is critical in order to realize meaningful change.

Key Challenges and Opportunities

A variety of themes emerged from the stakeholder interviews—themes that present both challenges and opportunities for the evolving world of pharmacy services in Canada. The following section outlines the top issues raised by health and pharmacy stakeholders in terms of operating environments, value and impact assessments, professional changes, legislation and regulation, payment mechanisms, public perceptions, and professional implications.

1. Operating Environments

Pharmacists work in a variety of service delivery models in the community, from independent stores, chain stores, as part of an interprofessional practice such as a primary care¹⁶ team, or in independent specialty practice for various conditions. They work in isolated and rural communities where there may be only a few pharmacists, and in cities where there may be an abundance of options for pharmacy services. The location and operating environment of each model has a direct impact on whether, how, and in what way the expanded scope of pharmacy practice manifests, and can be optimized.

The Corporate Conundrum

Community pharmacy is largely based on a for-profit business model. Many interviewees suggested that in the realm of health care services, this is unique to pharmacy, and that this competitive, corporate environment has challenges. Some expressed uncertainty about the motivations of pharmacy businesses (not individual pharmacists per se) in seeking expanded scope and associated compensation. Business models with outside shareholder commitments seemed especially concerning. Examples cited include pressures on pharmacists to meet

¹⁶ Primary health care “is linked to and often provides a referring or coordinating function for other specialized health care sectors as well as community services ... [it is] a service at the entry to the health care system.” Mable and Marriott, *Sharing the Learning*.

quotas and targets—an issue that became more controversial following a media exposé. Legislators are particularly sensitive to the issue of potential fee-for-service implications, which could generate ethical dilemmas and perverse incentives. For example, in the medical profession, fee for service often incentivizes volume of care. A remuneration model for pharmacists that emphasizes volume for a particular service without clear indication guidelines to ensure appropriateness of service may result in unnecessary care and costs. This issue is similar to the perceived conflict of interest in the situation where physicians who make available diagnostic X-ray services in their own private practice can also provide requisitions for X-rays, dentists who order tests or procedures can then provide the service, or surgeons who assess and prescribe procedures can then perform them for a fee. This type of conflict of interest may also be apparent if pharmacists can dispense medications on a fee-for-service basis while also being able to prescribe.

However, other interviewees suggested health professionals such as physicians and physiotherapists are similarly based on a for-profit business model and that duty to care, professionalism, and ethics overrule business interests among those groups, as in pharmacy, and that these potential conflicts of interest are not considered an issue in these cases. They also note that other health delivery organizations have targets, such as for joint replacement surgeries or wait times, all with the objective of improving health outcomes and improving efficiency.

Some felt that the business model of pharmacy, particularly with a chain model, helps facilitate broad uptake of expanded scope and services. When this service addresses public health concerns, such as vaccinations, the benefits are felt to be strong. However, others noted that smaller, independent pharmacies—a significant portion of pharmacies in some jurisdictions—can find keeping up with new services and the changing role of the pharmacist challenging. Developing programs, processes, and keeping up with the certification and training are additional challenges. If there is no compensation for the services then it is challenging for smaller pharmacies to commit time and resources that detract from their core business and bottom line.

A Systems Perspective

Whatever the model, many commented that a “systems” approach to the effective and sustainable deployment of health human resources is needed. There is strong interest in finding the best opportunities and model to leverage the unique contributions of pharmacists as part of the overall basket of services provided, and to ensure there is no duplication of services. The rapid growth in administration of flu vaccines in community pharmacy was cited by all as a success story, with some indicating that this growth was strong after public payer funding was introduced.

Many thought that the inclusion of pharmacists in current interprofessional team models was beneficial, but were less specific about how this could be operationalized in the context of the existing community pharmacy business model. Regions with an undersupply of pharmacists expressed the need to keep up with advancements in expanded scope of practice models in order to ensure they are able to recruit and retain new pharmacists. Inconsistency across pharmacies, in terms of the type of services offered, and the quality of services delivered was raised; however, others noted few complaints have been registered regarding professional practice and the associated expanded scope.

2. Evidence of Value and Impact

A Leap of Faith

According to our interviewees, programs that leverage the expanded scope of pharmacists are built on the premise of better utilization of the skills and expertise of pharmacists in community settings, with a “leap of faith” that the evidence will follow in terms of jurisdiction-specific health and economic impacts. Perhaps the strongest convergence of opinion among interviewees was around the shortfall of evidence of value and impact. All wanted it, and many were frustrated that they had seen few health or economic impacts—despite the abundance of high-quality research on specific conditions and examples of innovative individual pharmacist practice. For public payers in particular, an overriding interest was in understanding the impact and value gained from investments made to date. Value was expressed in terms of outcomes, patient experience, and system impacts.

As noted earlier, our research shows that the strongest impact has been around the introduction of injecting into scope and the associated publicly funded payment for flu vaccine delivery. Flu vaccine rates have risen dramatically in some jurisdictions as a consequence of this service being offered in community pharmacy. How this ties to associated health impacts, such as fewer incidents of flu in the population, reduced visits to emergency rooms, fewer cases of complications from the flu, or system-wide cost efficiencies of delivering vaccines through community pharmacy versus public health clinics or physician offices, remains largely unknown.

Other services that have seen an uptake in community pharmacies include medication reviews, assessments, and care plans (in Alberta). Many public payers indicated that they have invested significantly in this service. Each jurisdiction has its own criteria for eligibility and compensation but share a common intent to improve the medication management for individuals with complex health needs. The expectation is that better medication management would have the benefit of reducing adverse events, improving compliance, and ensuring appropriate use—and have associated benefits to reduce health system utilization and costs. For example, many public payers have expected to see better medication management and fewer adverse events in long-term care settings as a result of investments made in medication reviews. However, many expressed disappointment that these benefits have yet to be realized, while also acknowledging their shortfall in not establishing appropriate monitoring and evaluation of these programs.¹⁷ Some noted the need for better data collection systems and clearer definition of the information that should be collected.

The Evaluation Imperative

Most indicated that value-focused research is extremely difficult and costly to conduct. Canadian-based pharmaceutical research has been completed, and is in progress through programs such as the EPICORE Centre, UBC’s Pharmacists Clinic, Nova Scotia’s Minor Ailments Demonstration Project, Réseau STAT,¹⁸ and the Ontario Pharmacy Research Collaboration (OPEN), including projects focused on methodology design. In addition, pharmacy clinics are being introduced in some post-secondary institutions with both a service delivery and research mandate. Many hope the findings from these efforts will provide clearer insights into

¹⁷ These views align with recent research findings. See MacKeigan and others, *MM40 Implementation of Medication Management Services*.

¹⁸ Soutien Technologique pour l’Application et le Transfert des pratiques novatrices en pharmacie.

the specific opportunities to optimize the expanded scope of pharmacy practice in community settings.

Some interviewees pointed out that the call for providing evidence on outcomes and cost-effectiveness is not applied consistently across health professions, and suggested that this standard should be applied evenly to all services delivered and funded by public payers. Many noted that decisions are often based on factors other than evidence and research, including history, tradition, politics, power, and the fiscal environment.

3. The Pharmacy Profession

As previously noted, the role of pharmacists and community pharmacies in Canadian health care is evolving. Recent expanded scope of practice changes in many jurisdictions are moving pharmacy practice beyond the traditional medication dispensary model, into a new type of professional practice that includes consultative services and expanded health care delivery. Managing these culture changes requires both pharmacists and other health partners to re-evaluate the pharmacist's role as a health care provider.

A Learning Curve

The interviewed stakeholders noted that great opportunities exist to more fully optimize the skills and training of pharmacists, which can lead to improved health outcomes and good patient relationships, and produce greater job satisfaction. More pharmacists may also be attracted to jurisdictions where more advanced practice is allowed and funded. However, interviewees also mentioned several ways in which these changes represent a learning curve for pharmacists—especially those who have been practising for many years under a more traditional dispensary model. Learning how to effectively provide assessments and patient consultations, in addition to the practical skills, requires training and practice to build confidence. Some jurisdictions require specific certification and training courses for particular areas (e.g., injection training), some offer online modules (often with a fee for individual pharmacists), and others are still working through the standards of practice and implementation plans for expanded scope that has been legislated. There are also differences in the uptake of new training, processes, and education, as independent pharmacies may not have the same resources or standards as the larger retail chains. Many pharmacists have found the opportunity to observe colleagues who have already implemented specific services particularly helpful.

Interviewees pointed out that establishing good working relationships with other health care providers also takes time. The traditional pharmacy profession is highly technical, and its operating environment often differs substantially from those of other publicly funded health partners. Some pharmacists need to learn how to work effectively with health partners who may be initially resistant to expansions in pharmacy scope of practice. A culture change is therefore required from both pharmacists and other health partners, particularly when starting to work together as a team (e.g., to increase compliance and provide effective medication reviews). Stakeholders repeatedly emphasized that pharmacists are medication experts. They can add capacity and help educate other health care professionals on how to increase compliance and adherence, reduce potential drug interactions, and de-prescribe unnecessary medications. A key barrier they identified to this collaboration is the lack of shared electronic medical records (EMR) in some jurisdictions. Structured data collection, which is easy to access and share among pharmacists, doctors, and hospitals, is crucial for good clinical practice collaboration, and many jurisdictions are currently investing substantial resources in upgrading and implementing EMRs.

Stakeholders also noted that colleges of pharmacy play a crucial role in ensuring that the next generation of pharmacists receives the necessary skills and training to meet the growing demand for pharmacist-provided health services. In addition to educating both established and new pharmacists, jurisdictions must also ensure that internationally educated pharmacists (who make up a significant number of those practising in some provinces like Ontario) receive the necessary training and experience. Depending on where they received their training, they may also experience challenges in adjusting to expanded scope. The culture changes raised in the interviews—for pharmacy and related health care providers—take time to establish. Yet many interviewees also emphasized that this learning curve should not prevent decision-makers from exploring ways in which pharmacy can be better optimized to help achieve patient health outcomes and system sustainability goals.

Advanced Specialization

During our interviews there was some discussion around specialization and advanced practice. In some jurisdictions there are designations for those who attain higher levels of certification—such as advanced or extended practitioners. Some of the leading practices that were identified included pharmacists working in specialized areas that were disease specific (e.g., diabetes, cardiovascular, travel medicine, methadone, international normalized ratio management, and counselling, among others). Some noted that a viable business model often required a dispensing component along with a specialty focus.

An additional area mentioned was the rise of point of care testing available for individuals and the potential implications for pharmacist practice. Since these testing kits are sold in pharmacies, it was thought that pharmacists could have an increasing role in counselling individuals on results and any associated treatments.

4. Legislation and Regulation

As previously noted, expanded scope legislation varies considerably across different jurisdictions. Some provinces (e.g., Alberta, Saskatchewan, Manitoba, Nova Scotia, New Brunswick, Newfoundland, and Prince Edward Island) have already legislated a range of expanded scope services; whereas others (e.g., the territories) are still in the process of determining which new services to add.¹⁹ Several interviewees noted that the provinces are also at different stages of implementation and uptake for the services that are currently legislated—in some cases, standards of practice are still being developed and implementation has not yet caught up with legislation, so determining the full financial and health impacts of current expanded pharmacy services is difficult. Most jurisdictions have not yet established internal evaluation methods or devoted the necessary resources for these types of assessments, and the P/T government representatives interviewed want these data before investing additional public funding for these services.

Moving Forward

Further expansion plans also vary. Many jurisdictions are currently focusing on better managing the services they have already implemented (e.g., adjusting the guidelines around services like medication reviews to better target higher-risk, high-needs patients, or increasing the uptake of minor ailment assessments). Others will be re-negotiating pharmacy contracts over the coming

¹⁹ Canadian Pharmacists Association, *Pharmacists' Expanded Scope of Practice*.

year, or are in the process of updating additional pharmacy scope expansions.²⁰ Yukon, which does not currently allow any expanded scope services, has established an advisory committee to modernize the territory's pharmacy legislation and align with some of the services already offered in many of the provinces and has tabled Bill 88, the *Pharmacy and Drug Act*, as an initial step in this process.²¹

Jurisdictional Complexities

Although some interviewees expressed interest in eventually establishing a set of national definitions and standards governing specific pharmacy services, others noted that current expansion attempts must deal with existing political and jurisdictional realities. Definitions surrounding specific services (e.g., what is included in “minor ailment lists,” or what prescription adaptations pharmacists are allowed to make) vary. Differences also exist in the approach to minor ailments. For example, Alberta has taken a comprehensive approach that sees minor ailments prescribing included within additional prescribing authorization and addressed through medication management assessments or patient care plans, while other regions allow all licensed pharmacists to prescribe for discrete conditions that are included in a list. Some stakeholders feel that a broad range of public health vaccines, beyond just the flu vaccine, should be available in community pharmacies. Others suggest that attending to the needs of individuals with complex conditions does not rest solely with pharmacists, and could instead be approached through collaborative care, in which a pharmacist plays an integral role as part of a health care team.

In determining how expanded scope will be implemented, regulators must also mitigate potential ethical complications, such as avoiding conflicts of interest that may arise from allowing pharmacists to both prescribe and sell, and negotiating competing corporate and public health care provider interests. New pharmacy regulation should also ensure accountability, consistency, and quality. To achieve this goal, stakeholders in different jurisdictions stress the importance of establishing good working relationships between pharmacy, P/T governments, and key health care providers (e.g., physicians), as well as involving each of these groups in all stages of the process of expanding pharmacy service scope. Strong collaboration between these groups facilitates the process and avoids many of the tensions and complications other jurisdictions have experienced.

5. Reimbursement/Remuneration Models

Payment for pharmacy services—both expanded scope and core services—can happen through public payer compensation, insurer coverage, or out-of-pocket payment. There is significant variation across jurisdictions on public payer compensation—some pay for many services while others pay for none. See Table 1 for a snapshot of current public funding models for pharmacy services in Canada by province and the section on “Public Funding Variations.”

²⁰ For example, Saskatchewan's Bill 151 or Quebec's Bill 41.

²¹ Government of Yukon, *Yukon Government Tables New Pharmacy and Drug Act*.

Table 1. Publicly Funded Pharmacy Services by Province

	B.C.	Alta.	Sask.	Man.	Ont.	Que.	N.B.	N.S.	P.E.I.	N.L.
Medication review/assessment—basic/standard	✓	✓	✓		✓		✓	✓	✓	✓
Medication review/assessment—specific for diabetes		✓			✓				✓	✓
Medication review/assessment—advanced/comprehensive		✓			✓			✓		
Minor ailments assessment/prescribing		✓	✓			✓		✓		
Smoking cessation		✓	✓		✓	✓				
Immunization	✓	✓	✓	✓	✓		✓	✓	✓	✓
Prescription adaptations, renewals, trial prescriptions, refusal to fill prescriptions, pharmacist's opinion, etc.	✓	✓	✓		✓	✓		✓	✓	✓

Source: Canadian Pharmacists Association, *Publicly Funded Pharmacy Services by Province*.

Public Funding Variations

Provinces have taken a variety of approaches regarding public compensation for pharmacist services. A comprehensive fees and claims data chart for the public compensation offered for various services is available in a report by the Canadian Foundation for Pharmacy (CFP).²² Implementation and uptake of expanded scope depends in large part on appropriate funding models. For the areas of expanded scope addressed in Chapter 2, and according to the CFP report, the following variations in public remuneration exist:

Renew/Extend Prescriptions for Continuity of Care and Changes to

Dosage/Formulation: Public remuneration is highest in Alberta (\$20 per assessment for renewals, adaptations, and discontinuations) and lowest in Saskatchewan (\$6 to renew or alter dosage/missing information). British Columbia provides \$10, Quebec provides \$12.50, Nova Scotia provides \$14, Prince Edward Island provides \$14.83, and Newfoundland and Labrador provides \$11.96 to \$12—according to provincial restrictions and claim limits. Funding is not provided for these services in Manitoba or Ontario.

Make Therapeutic Substitutions: Public remuneration is highest in Alberta (\$20 per assessment) and lowest in Newfoundland and Labrador (\$11.96 to \$12 for provincial drug plan beneficiaries). Nova Scotia provides \$26.25, but only for proton pump inhibitors. British Columbia provides \$17.20 and Prince Edward Island provides \$14.83. Funding is not provided for these services in New Brunswick.

Initiate Prescription Drug Therapy: Alberta provides \$25 per assessment for initiating drug therapy. Ontario provides funding for Schedule I smoking cessation therapy (see below) and Quebec provides funding ranging from \$15.50 to \$16 to prescribe medication for which no diagnosis is required depending on specific therapeutic targets and restrictions. Manitoba, Saskatchewan, New Brunswick, and Nova Scotia pharmacists have the authority to initiate prescription drug therapy within a collaborative practice agreement/setting but the provinces provide no funding for this service.

Prescribe for Minor Ailments and Smoking Cessation: Saskatchewan provides \$18 and Quebec provides \$16 per minor ailment assessment. Minor ailments prescribing in Alberta is reimbursed through Comprehensive Annual Care Plans (CACPs), Standard Medication Management Assessments (SMMAs), or initial-access prescribing. Manitoba, New Brunswick, Prince Edward Island, and Newfoundland and Labrador do not provide funding for these services. For annual smoking cessation-related services, Saskatchewan provides up to \$300 annually and Ontario provides up to \$125. Alberta includes these services as part of SMMAs. Funding is not provided in Manitoba, Prince Edward Island, or Newfoundland and Labrador.

Administer a Drug or Vaccine by Injection: All provinces (except Quebec, where this service is not authorized except for demonstration purposes) provide public remuneration for flu vaccines. Alberta provides the highest public payment (\$20) and Manitoba provides the lowest (\$7). British Columbia provides \$10, Saskatchewan provides \$13, Ontario provides \$7.50, Nova Scotia provides \$12, New Brunswick provides \$12 (for seniors and high-risk groups), Prince Edward Island provides \$12.36 (for high-risk groups), and Newfoundland and Labrador provides \$13 (for provincial drug plan beneficiaries). Alberta, at \$20, is the only province to provide public remuneration

²² Canadian Foundation for Pharmacy, 2015 *Changing Face of Pharmacy*.

for the assessment and administration of other drugs by injection (excluding travel vaccines).

As these examples show, in some cases, significant variation exists in public funding models for pharmacist services. These remuneration variations affect uptake and effectiveness. The implications of these funding model variations will be discussed in greater detail below. (See “Three Jurisdictions—Three Approaches.”)

Future Funding

Overwhelmingly, public payers are interested in determining how to leverage their investment in pharmacy services for the highest-need, highest-cost patient populations in order to achieve real impacts on health and system sustainability. However, for many, existing criteria and payment frameworks for complex, high-needs patients are not delivering the results expected and there is interest in working with key stakeholders—including other professional groups—to build on the experience to date and explore how to better target this population. There seems to be little appetite in some jurisdictions for creating a new fee-for-service model for another professional group, and some question the sustainability of their current payments for pharmacy services. Some believe that, similar to other professions like physiotherapy, pharmacists and pharmacies should charge a fee for the valuable services they provide, and that there is untapped interest and willingness to pay among the public. Travel medicine clinics were cited as an example. However, others believe that the public seems to have little appetite for paying out-of-pocket for pharmacy services, suggesting that pharmacy care can often be misconstrued by the public as being covered by the health care system. In a competitive location, charging a fee for a pharmacy service could drive that individual to another pharmacy that doesn’t charge. This also creates a two-tiered system, where those that are able to pay out of pocket for access to health care receive timely service, while others must go to a doctor or emergency room where the service is paid for by the government. The same service, if a reimbursable benefit under the government reimbursement schedules, should be covered no matter which qualified health care provider is delivering the service.

In some jurisdictions where public payment for expanded services is limited, some expressed interest in targeting private payers, such as out-of-pocket, and private insurance. However, our interviews suggest that among insurers, there appears to be limited appetite for including pharmacy services in the basket of benefits that make up employer plans. From the insurer perspective, this is partly because many of the services are seen as being part of the public realm, and partly because the costs of coverage for things like specialty medicines are crowding out other potential items in benefits plans. A few exceptions were noted, including Green Shield Canada’s new “health coaching” service provided by pharmacists and offered to plan members who meet certain criteria.²³ Quebec’s new pharmacy legislation, Bill 41, requires insurers to pay for the same pharmacy services that the public payer compensates.

²³ Green Shield Canada, *GSC Update*.

6. Public Perceptions

In Canada, there is a large public appetite for health care services that are affordable and easily accessible. However, public awareness of expanded scope and willingness to pay for some of these services varies. Opinions differ regarding who is ultimately responsible for educating the public about expanded pharmacy services and different stakeholders (e.g., P/T governments and pharmacy associations through public service campaigns, or community pharmacies through local advertising) have taken the lead in promoting different services in different ways. When no one takes the lead in promoting new services, large proportions of the public are often not even aware that these services exist. Furthermore, due to the implementation limitations mentioned in the previous section, uptake of expanded services in different pharmacies is often inconsistent, so the public doesn't always know what to expect.

Health Service Entitlement

In many jurisdictions, there is also a strong sense of entitlement regarding health care services. Some public surveys indicate that many people would rather endure longer wait times than pay relatively low out-of-pocket fees for specific services. In jurisdictions where pharmacists are allowed to charge for specific services, many find asking for payment for certain services difficult, as the Canadian public is often not used to paying for services that they can access for “free” in other health care provider settings.

However, public willingness to pay may increase over time, as there is already an appetite for services that are not publicly funded. People are willing to pay for travel medicines and other non-publicly funded vaccines (e.g., the shingles vaccine) and some pharmacists have successfully managed to promote affordable services that save patients long wait times. Most jurisdictions have an abundance of community pharmacies that are open later than most doctors' offices or walk-in clinics. Community pharmacies are extremely accessible and pharmacists are already a key point of contact for many patients.

7. Pharmacy in Practice

Changing the nature of pharmacy practice to include new consultation and assessment services requires additional time and resources, and fundamentally changes the work environment within a community pharmacy setting. Many pharmacists fill hundreds of prescriptions per day and their current work load does not allow for the extra time required to do in-depth clinical follow-ups. A re-evaluation of workflow expectations is therefore required before expanded scope can be properly implemented. Simply adding expanded scope expectations onto current workflow models will not produce the results public health officials are looking for.

Workflow Adjustments

Both pharmacists and decision-makers need to understand what the new scope of practice entails, as well as what the pharmacist can reasonably be expected to do within the current pharmacy setting and its existing resources. Time allowances need to be made for specific expanded scope services, which often conflict with corporate objectives (e.g., quotas that support the profit drive of a competitive marketplace). Many jurisdictions are looking to pharmacy technicians to take over some of the traditional distribution and dispensary-related work, to allow pharmacists to focus more on providing patient care and clinical services. However, not all pharmacies are able to afford the extra staffing resources under current business models. It is also often harder for individual pharmacies to come up with the physical

space requirements (e.g., private consultation rooms) that expanded scope of service legislation requires.

These changes in practice affect the quality of care pharmacists are able to provide and impact their ability to meet specific assessment, medication management, and health service objectives. Some experts suggest an appointment-based system for specific services, but not all pharmacies have the capacity for this. To ensure that high-needs patients receive the necessary time and attention, others suggest a referral system, where patients with multiple medications receive a referral for a medication review when leaving a hospital. Community pharmacies across the country are looking for ways that workflow models can be adapted to better meet changing practice realities. (See “Three Jurisdictions—Three Approaches.”)

Three Jurisdictions—Three Approaches

Each province/territory has taken a different path to expanding the scope of pharmacist and pharmacy services. Each approach has strengths and weaknesses when considering how to optimize expanded scope for better health and better value. This is reflected in the varying perspectives shared during our stakeholder interviews.

The Alberta Approach: Comprehensive Scope and Payment

Compared with other jurisdictions in Canada, Alberta has adopted an approach that entails comprehensive scope and robust government funding for an array of pharmacist services. From prescribing and injection authority, to ordering and interpreting laboratory tests, the scope of pharmacist practice is broad enough to apply to pharmacists in general community practice (including assessment and management of minor ailments) as well as more intensive medication management from pharmacists with specialized training and authorization. This creates opportunities for pharmacists to have a more active role in management of chronic conditions.

The broad injection authority of pharmacists in Alberta has the potential to help improve public health goals of greater vaccination uptake, and pharmacists are now thought to provide the largest share of flu vaccines in the province. Pharmacist care plans have been designed to be complementary to physician care plans, to help facilitate collaborative care among providers. As self-management opportunities grow through point-of-care testing, the broad scope of pharmacists in the community may be leveraged even more for medication management.

Scaled compensation that provides higher reimbursement for pharmacists with additional authority acknowledges their capacity to provide an advanced level of care and potentially help foster improved health outcomes and health system performance. This may also provide an incentive for pharmacists to secure this authorization.

The scale of change has been significant and efforts are under way to develop a better understanding and management within the model. Interest is strong for ensuring the model achieves excellence in medication management for the high-needs population, and in turn enhanced health system efficiencies and value for the public payer. Despite the robust scope and compensation, there continue to be some challenges.

Communication between pharmacists and other health providers around care is still thought to be suboptimal, partly because of process (the lack of integrated patient records and privacy issues) and partly because of professional culture.

At the population and health system level, the health outcomes and system efficiencies afforded by the design and investment in the model are not always clear. Several reasons were suggested, including a lack of appropriate measures, evaluation, and research for understanding the impacts, and a service provision that appears to have focused on less complex clients and profession-specific issues.

Selective Scope and Payment: The Ontario Approach

Expansion of scope of practice in Ontario has been incremental and includes the authority to adapt or renew prescriptions, prescribe medications for smoking cessation, as well as the authority to inject (influenza vaccine only). Expanded services including MedsCheck²⁴ and Pharmaceutical Opinions programs²⁵ are touch points where pharmacists may leverage this scope to optimize drug therapy and improve health outcomes for the care recipient. MedsCheck programs for home care and long-term care recipients and patients with diabetes aim to further target at-risk populations that could benefit from these pharmacy services. Remuneration for services by the public payer have similarly been targeted, with a focus on individuals with chronic conditions and on multiple medications, with some restricted to Ontario Drug Program beneficiaries. Hands-on care, such as demonstrating the use of a lancet for blood glucose monitoring, as well as injection authority, are additional areas of expanded scope. The Universal Influenza Immunization Program (and associated remuneration for pharmacies) leverages this expanded injection authority to facilitate improved uptake of annual flu vaccine administration (age 5 and older) within a pharmacy setting.

For some, the incremental approach is seen as a strength for its potential to foster an interprofessional approach to health service delivery. It provides an opportunity for assessing and evaluating the impact of changes within the broader context of the health system and provides an opportunity for adoption to change in the pharmacy and associated health professional communities.

The pharmacist role in administering flu vaccine in Ontario was consistently noted to be a success, with indications that the public has grown very comfortable receiving this expanded scope of care through pharmacists and community pharmacy settings.

However, some believe the narrow scope (compared with other jurisdictions) limits the opportunity to leverage the full potential of pharmacists and community pharmacies, especially for addressing minor ailments. Some feel that Ontario is missing out on significant health system efficiencies associated with a minor ailments program. Restrictions on the type of vaccine that can be administered and where it can be administered were also suggested to be a lost opportunity for increasing uptake and realizing the associated public health impacts. Variations in uptake of the expanded scope have led to inconsistency in service experiences for the public. The lack of, or insufficiency of compensation for services in the expanded scope, were noted by some to be a barrier. The lack of scaled compensation based on complexity of cases was

²⁴ MedsCheck is a publicly covered, one-on-one 30-minute annual appointment with a pharmacist for patients taking a minimum of three medications for a chronic condition. At the MedsCheck, pharmacists review medications, help patients better understand their medication therapy, and ensure that the medications are being taken as prescribed. Ontario Ministry of Health and Long-Term Care, *MedsCheck*.

²⁵ When dispensing a prescription or conducting a MedsCheck review, pharmacists may provide a clinical intervention when they identify a potential concern that requires a follow-up consultation with the original prescriber. Ontario Ministry of Health and Long-Term Care, *MedsCheck*.

considered a weakness, as were uncertainties related to the cost-benefit and overall health system impact of the current expanded scope.

Comprehensive Scope and Limited/No Payment: The Manitoba Approach

Pharmacists in Manitoba have a broad scope of practice that provides many opportunities for them to have an active role in medication management and care in community settings. Pharmacists with the requisite training and authorization have an extended scope that enables them additional prescribing authority within a collaborative practice setting/agreement. Their ability to prescribe for medical devices was felt to be an additional benefit for individuals because of increased access. The broad injection authority creates opportunities to improve access and uptake of vaccines as well as education for individuals requiring injectables as part of their health care. Some feel that the slower pace of change in moving ahead with expanded scope in the province has created the opportunity for education and training and cultural change that is needed for pharmacists and community pharmacies to adopt the changes in practice.

While the scope of pharmacist practice is quite robust, there is limited remuneration from the public payer for the services. Some believe that this lack of compensation is an impediment to realizing the full potential of the expanded scope possible for pharmacists. However, as with the other jurisdictions, there is very limited evidence of cost-benefit for the overall health system.

Public Payer Priorities

Throughout the interview process, clear priorities emerged from the public payer perspective regarding optimizing the expanded scope of pharmacy practice. Top priorities include:

1. Achieving health system savings by reducing the costs associated with unnecessary doctor and emergency room visits. To achieve these savings, governments want to see clear value for the money spent on health care services (ensuring that no duplication of paid services occurs, leveraging the lowest-cost provider where scope overlaps—preferably with an alternative to the fee-for-service model, and seeing improved health outcomes for money spent). They want publicly funded programs and services to have a monitoring and evaluative component so they can measure progress and see the return on their investments. They were skeptical of how expanding pharmacists' services could truly reduce overall cost to P/T health care systems. The concern is that demand for care is so great and wait times so long, that even with changes to the supply of health care services (e.g., shifting care to less costly settings or health care providers) that may improve population health through greater or quicker access, these changes may not necessarily reduce overall costs. It is therefore important to consider the impact on the broader health care system in economic analyses of expanded pharmacy services or new models of care.

2. Leveraging the core skill set of pharmacists with a focus on safety, adherence, compliance, and appropriate use. Governments are most interested in leveraging pharmacists' medication-specific skills to improve health outcomes, reduce harmful drug interactions, and reduce the number of medications high-risk patients are taking. As the medication experts, they see pharmacists as uniquely suited to help achieve this goal.

3. Improving health outcomes. Governments would like to see pharmacists take a greater role in chronic disease management (e.g., for cardiovascular risk factors), health promotion (e.g. flu

vaccine uptake), and prevention (e.g., smoking cessation). Located in communities throughout Canada, the infrastructure is already in place for pharmacists to play a greater role in health management, screening, and education.

4. Serving the high-needs/high-cost population. Re-examining existing programs for services like medication reviews or care plans to ensure they are reaching the intended population (complex, high-needs, high-cost, vulnerable, at-risk patients). Many jurisdictions introduced compensation for programs such as medication management to specifically target this key demographic. Governments are interested in adjusting criteria to increase the uptake of medication reviews for the highest-need patients—to ensure the best medication management and health outcomes for this target group.

5. Exploring approaches to better leverage the skill set of pharmacists, and services of community pharmacies, in primary care. Government representatives expressed interest in seeing greater collaboration and strong working relationships with other health care providers. Many expressed interest in exploring models which better integrate pharmacists in interdisciplinary settings, primary care teams, and other collaborative practices—models in which pharmacists play a key role as part of an effective and cost-efficient health team. Integrated drug information systems, where patient information can easily (and securely) be shared, are an important aspect of health collaboration.

These priorities emphasize government interest in the triple aim of health care: achieving better health outcomes, improving the patient experience, and reducing per capita health care costs. Based on available evidence, P/T governments are expanding scope and implementing compensation for pharmacists in a variety of ways to meet these goals.

Chapter 4: Evidence of Pharmacy Services' Health and Economic Impact

Chapter Summary

- Analyzing the evidence on pharmacist and pharmacy services reveals which ones are most effective at both improving population health outcomes and productivity and reducing or maintaining health care costs.
 - Factors that complicate the ability of jurisdictions to both understand the value and scale up particular services include how combinations of services can be combined within one program, program duration and follow-up, outcomes of interest, target populations, delivery settings, and other enabling factors.
 - Based on the evidence, key services for which there is potential to scale up include smoking (tobacco) cessation, influenza vaccination, cardiovascular disease and related conditions, asthma and COPD (chronic obstructive pulmonary disease), neuropsychological (brain) health, medication review and management, and minor ailments assessment and prescribing.
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Over the past decade, we have seen an increase in the number of studies examining the role of expanded roles and services of pharmacists and pharmacies in health care systems alongside the legislative and regulatory changes across Canada. Although the amount and quality of evidence on the impact of pharmacists and pharmacy in health care has increased for certain services, the supportive literature is still quite variable and lacking overall. The value of reviewing the evidence on pharmacist and pharmacy services is to establish for which services the evidence supports their effectiveness for both improving population health outcomes and productivity, while reducing or maintaining health care costs from a health care system and societal perspective. We conducted a review of the more recent literature to examine the health and economic impact of pharmacist and pharmacy services in order to extract insights for Canada. (See “Literature Review and Information Synthesis Methodology” for a description of the general approach.”)

The main insights from the literature review were synthesized and summarized in a narrative format in this chapter and categorized by type of pharmacy or pharmacist service (therapeutic area). Additional insights were included to highlight challenges and opportunities with each service identified in the literature. Several services for which there is potential for scale-up will be selected for modelling based on the evidence of effectiveness as well as insights generated from interviews with key system stakeholders. (See “Summary of Stakeholder Priorities.”)

Literature Review and Information Synthesis Methodology

The evidence summary in this report employed a multi-pronged, iterative approach to identifying, extracting, and synthesizing best evidence on the effectiveness, and where available, the economic impacts of specific health care services (non-dispensing) delivered by pharmacists. As a starting point, the Conference Board developed a search strategy using a combination of key search terms and medical subject headings (MeSH) applied to two electronic health research databases – Medline and Embase. These two databases, combined, represent millions of records of empirical, peer-reviewed, research studies covering biomedicine, health, drugs, and pharmacology.

A total of 1,573 unique articles were identified applying the search term selection strategy in early November 2015, of which 428 articles were retained after a phase 1 review conducted by two research assistants. The research assistants screened-in articles based on scan of the article titles and abstracts and after applying broad inclusion criteria related to year of publication (from 2007 until November 2015), country of publication (Canada, U.S., Australia, or U.K.), language of publication (English or French), and after screening for articles specific to pharmacists' role (non-dispensing) in health care. Articles that were not experimental or quasi-experimental in design, such as conference abstracts, letters, editorials, or commentaries, and studies that did not specifically examine the pharmacists' role as the primary study intervention, were excluded. A total of 1,145 articles were excluded on this basis. Of the 428 studies, 50 were further retained by limiting the studies to review articles only. Several additional studies were considered in this analysis through a review of relevant bibliographies and a scan of grey literature such as white papers and research-in-progress.

In the phase 2 review, the researchers did full-text reviews of selected studies of any systematic reviews identified in phase 1 and selected key randomized controlled trials that focused on estimating the impact (health and/or economic) of community pharmacist interventions that could be scaled up in Canada. A total of 56 studies that included those identified in the literature search in Medline and Embase and through a screen of bibliographies had their full text reviewed and relevant information extracted and summarized by the research assistants. A summary of the best evidence from this review, categorized by therapeutic area, can be found in tables throughout this chapter. Other studies were referred throughout as part of the narrative review in this chapter.

Best evidence refers to quality of evidence in terms of study design and its ability to establish a relationship between an intervention (policy, program, treatment) and one or more outcomes of interest. The hierarchy of evidence usually follows the following, from strongest to weakest: meta-analyses or systematic reviews, randomized controlled trials, quasi-experimental studies such as cohort studies, case-control, and cross-sectional studies, correlation studies, qualitative studies, and then expert opinion. Best evidence in the context of this report also refers to research conducted more recently (e.g., in the past decade) and which has findings that can be generalizable to the Canadian context.

Smoking (Tobacco) Cessation

There was good evidence in this review for the use of community pharmacy for a cessation intervention for smoking and chewing tobacco. (See Table 2.) Of the studies reviewed, we identified several that established a significant likelihood of quitting before and after a pharmacist intervention. Very few studies, however, compared pharmacist intervention with a control intervention such as compared with a smoking cessation program in general medical practice (physician's office), public health, or patients trying to quit on their own. One study showed that pharmacist intervention that included a multi-visit counselling program grounded in behavioral psychology within which pharmacists are provided with adequate training, in addition to providing medication reviews and having prescribing authority, were more likely to be effective over the longer term with six months or more follow-up time.²⁶

The study that evaluated costs found that pharmacist intervention was generally found to be more cost-effective compared with tobacco cessation interventions in other settings, including general medical practice. Although drug costs seemed to increase with pharmacy intervention, pharmacist fees were generally lower.²⁷ It should also be noted that one of the studies we reviewed showed patients of lower socio-economic status (SES) were more likely to go to general medical practice for smoking cessation interventions than in pharmacy, which may explain better quit rates in pharmacy compared with general medical practice.²⁸ Research shows that patients with lower SES experience greater difficulty in quitting than their counterparts.²⁹ However, in one Canadian study, the quit rate with pharmacist intervention was considered to be good at 1.7 per cent in the low SES population at six months follow-up.³⁰

Many of the studies on tobacco cessation programs in community pharmacy identified financial incentives for pharmacists and patients. Most programs included remuneration of pharmacist time for counselling and some programs included financial incentives for patients such as coverage of medications.^{31,32,33} Virtually all studies identified the need for more research that includes appropriate controls and follow-up times to establish sustained quit rates. Future studies should also use biochemical verification of quitting as it is a more reliable and valid measure than self-reported abstinence.

As an area of priority more globally, the high economic costs of smoking among low SES populations has resulted in the World Health Organization's call for the development and implementation of tobacco cessation interventions to be a high economic and clinical priority.³⁴ Based on the research to date and the likelihood of more and better-quality evidence to come, tobacco cessation interventions in community pharmacy are considered to be a moderate quality and high availability of data therapeutic service area that could be a candidate for scale-up consideration and modelling.

²⁶ Khan and others, "Smoking Cessation and Its Predictors."

²⁷ Csikar and others, "The Cost-Effectiveness of Smoking Cessation Services."

²⁸ Ibid.

²⁹ Hiscock and others, "Socioeconomic Status and Smoking."

³⁰ Bugden and others, *Manitoba Pharmacist Initiated Smoking Cessation Pilot Project*.

³¹ Ibid.

³² Csikar and others, "The Cost-Effectiveness of Smoking Cessation Services."

³³ Khan and others, "Smoking Cessation and Its Predictors."

³⁴ World Health Organization, *WHO Framework Convention on Tobacco Control*.

Table 2. Tobacco Cessation: Selective Summary of the Literature on the Health and Economic Benefits of Pharmacist and Pharmacy Services

Therapeutic area	Study reference	Study design	Regions or countries	Pharmacist or pharmacy intervention	Health benefits	Economic benefits	Challenges and opportunities
Tobacco cessation	Bugden and others ³⁵	Before- and after-study (uncontrolled) with 7 visits or touch points: pre-visit, assessment, quit day, follow-ups at 1 week, 1 month, 3 months, and 6 months after quitting	Man., Canada	Participants received smoking cessation products and counselling for 3 months in a community pharmacy setting. Intervention program included medication management advice to help adapt the products to each participant's lifestyle and needs.	63 per cent reported a reduction in cough and phlegm 1.7 per cent quit smoking at 6 months 19 per cent quit smoking at 3 months 30 per cent quit smoking at 1 month 41 per cent reduced the number of cigarettes they smoked each day	\$286 per month saved for participants who reduced their consumption of cigarettes	Inferior study design does not allow for direct comparison of impact with usual care or other program (lacks appropriate control group). Costs related to over-the-counter and prescription products, as well as compensation for pharmacist's professional counselling services, were covered by the pilot project. Average cost per patient was \$470. All participants were on employment and income assistance, with an average of 26 years smoking history, representing the most resistant and hard-to-reach population for smoking cessation. A total of 119 patients were recruited for the study.
	Csikar and others ³⁶	Study compared quit rate (effectiveness) with the cost of smoking cessation services in pharmacy, dental, and general medical practice against usual care (National Health Service's Stop Smoking Services program) using incremental cost-effectiveness ratios. Analysis was from the government payer perspective (U.K. National Health Service).	Bradford, U.K.	The intervention consisted of individual behavioural counselling, typically supporting the client over a 12-week period (pre- and post-quit) together with the offer of pharmacotherapy. The intervention was delivered by a trained smoking cessation advisor (pharmacist or pharmacy advisors) within a pharmacy setting. Each service provider received smoking cessation training.	38 per cent quit rate in pharmacy after 12 weeks compared with 45 per cent quit rate in dental; 20 per cent quit rate in general medical practice; and 45 per cent quit rate in NHS's Stop Smoking Services program	100.21£ per patient in pharmacy compared with £169.54 per patient in dental; £124.11 per patient in general medical practice; £111.08 per patient in NHS Stop Smoking Services program; and £265.38 per quit in pharmacy	Service providers were remunerated for their work using a payment by results scheme or a block contract. The provider submitted all records relating to client contacts using monitoring forms that captured socio-demographic and treatment outcome information. More patients from the lowest socio-economic group ("most deprived") attended a general medicine practice compared to a pharmacy or dental setting, which may explain the higher quit rates in pharmacy. Average professional cost per client in general medicine practice, therefore, was higher vs. pharmacy (£64 vs. £27). Pharmacotherapy costs were higher in pharmacy vs. general medicine (£73 vs. £59).

³⁵ Bugden and others, *Manitoba Pharmacist Initiated Smoking Cessation Pilot Project*.

³⁶ Csikar and others, "The Cost-Effectiveness of Smoking Cessation Services."

	Dadirai and Chindove ³⁷	Systematic review (studies published until May 2012)	U.K., Japan, Canada, U.S., Australia, and Denmark	Intervention consisted of behavioural counselling or support, as well as nicotine replacement therapy (NRT)/pharmacological approaches delivered by pharmacy personnel. Follow-up times ranged from 4 weeks to 12 months. In one case, behavioural counselling included a computer program to facilitate the delivery of the pharmacy-based intervention.	Combined effectiveness measurement across studies could not be provided due to heterogeneity. Of the included studies, pharmacy-delivered non-pharmacological interventions were most effective after 6 months, with three studies showing no benefit at shorter follow-up periods and one study showing no benefits at 9 months. Benefits ranged from 50 per cent to a two-fold greater likelihood of quitting at 6 months. One study evaluating the effectiveness of non-pharmacological and a pharmacological component to intervention (medication appropriateness) showed that intervention was 3.3 times more likely to result in quitting at 6 months compared to the control group.	Not applicable	<p>Authors noted that too few studies (10) were included in the review to make any conclusive statements. Six studies evaluated non-pharmacological interventions. There is a need for more evidence, especially about the effectiveness of pharmacy personnel-delivered NRT interventions.</p> <p>In general, non-pharmacological interventions that include multiple sessions are more effective than interventions involving only one session.</p> <p>Challenges of implementation:</p> <ul style="list-style-type: none"> • need for continual engagement and adequate follow-up of patients; • lack of time for pharmacists/pharmacy personnel and patients; • inadequate reimbursement for services (one study reimbursed each enrolled smoker £15); • lack of financial support for patients to cover cost of nicotine replacement therapy; • lack of financial incentives for patients to go to a pharmacist (small co-payments or free). <p>Computer-facilitated intervention delivery approaches may be effective and help with time constraints.</p>
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³⁷ Dadirai and Chindove, "Effectiveness of Tobacco Use Cessation Interventions Delivered by Pharmacy Personnel: A Systematic Review."

	Dent, Harris, and Noonan ³⁸	Systematic review of studies published between 1980 and 2006	U.S., U.K., South Australia, Denmark, and Scotland	<p>Individual studies of pharmacist-delivered tobacco-cessation services examined a range of interventions:</p> <ul style="list-style-type: none"> • nicotine transdermal system (NTS) (e.g., patch) intervention vs. minimal contact behavioural intervention; • structured community pharmacy program vs. ad hoc advice from pharmacists; • intervention started in hospital using NTS with continual program in community pharmacy or hospital setting vs. minimal intervention group. 	A combined effectiveness measurement was done using a control group and a biochemically verified quit group. Of these studies, a statistically significant difference in quit rates was found in the pharmacy intervention group at 3, 6, and 12 months when using a continuous abstinence efficacy measurement. The odds of quitting in the intervention group were 5 times higher at 12 months and 2.5 times higher at 3 and 6 months compared to the control group.	Not assessed	Authors recommend more studies evaluating effectiveness with longer follow-ups, use of biochemical verification of outcomes, effectiveness analyses, and appropriate control groups.
	Kahn and others ³⁹	Before-and-after study with 1-, 3-, and 6-month follow-up from initial visit. Program conducted for two fiscal years.	New Mexico, U.S.	Pharmacists provided with training consisting of an 8-hour workshop on the epidemiology of tobacco use; formulations of tobacco; principles of addiction; pharmacology and therapeutics of cessation products; assisting patients to quit; patient interview demonstration; and pharmacist role-playing. Prescribing pharmacists led the smoking cessation program. Pharmacists were reimbursed (up to \$200) for providing	Quit rates were consistent at 1, 3, and 6 months at 25–26 per cent at each follow-up.		<p>Inferior study design. Does not allow for direct comparison of impact with usual care or other program (lacks appropriate control group).</p> <p>Issues with missing follow-up data.</p> <p>Most patients were well-educated and non-Hispanic white. Almost half of patients had some form of health insurance.</p> <p>Most common cessation aids were over-the-counter.</p> <p>Most commonly used products were the nicotine patch, recommended about 30 per cent of the time, followed by bupropion at 12 per cent and inhalers at 11 per cent.</p> <p>Authors identified pharmacists having prescribing authority as a success</p>

³⁸ Dent, Harris, and Noonan, "Tobacco Interventions Delivered by Pharmacists: A Summary and Systematic Review."

³⁹ Kahn and others, "Smoking Cessation and Its Predictors: Results From a Community-Based Pharmacy Tobacco Cessation Program in Mexico."

				tobacco cessation services for up to 200 patients per year. Total counselling time over intervention course was at least 90 minutes. Pharmacist could provide medications to patients up to a total of \$137.50. Visit rates: \$75 for initial visit, \$25 for 1-month follow-up, and \$50 for each 3-month and 6-month visit.			factor where patients could go directly to the pharmacist when they were ready to quit without having to wait for a medical appointment.
	Jackson, Gaspic-Piskovic, and Cimino ⁴⁰	Descriptive study using administrative prescription claims data over 6 months	Sask., Canada	Employer-sponsored smoking cessation program with Green Shield Canada consisting of a pharmacist providing assessments and behavioural support to patients who wanted to quit smoking. Pharmacies were reimbursed for assessment and follow-up time. Rates ranged from \$10 for 5-minute assessments to \$40 for 20- to 30-minute assessments. Intervention included an initial face-to-face assessment and 6 follow-up appointments (face-to-face or by telephone). Additional appointments were held at the beginning of therapy to address poor adherence in the early stages.	37.5 per cent self-reported quitting at 6 months. Quit rates higher among men, compared to women, and higher among employees, compared to spouses.	Not assessed	Authors identified the challenge of pharmacy non-compliance with intervention protocols, which can complicate or jeopardize the collection of outcomes data.

⁴⁰ Jackson, Gaspic-Piskovic, and Cimino, "Description of a Canadian Employer-Sponsored Smoking Cessation Program."

	Sinclair, Bond, and Stead ⁴¹	Systematic review of studies published until October 2007	U.K.	A training intervention, which included the Stages of Change Model for pharmacists, with a support program that involved counselling and record-keeping, compared with a control group that received the usual pharmacy support. Patients in both the intervention and control groups eventually used nicotine replacement therapy.	A combined effectiveness measurement was conducted for all studies: One study showed a statistically significant difference in smoking abstinence at 12 months compared to the control group (14.3 per cent vs. 2.7 per cent). One study showed a slightly significant difference in smoking abstinence at 9 months compared to the control group (12 per cent vs. 7.4 per cent).	Not assessed	<p>This review on its own does not provide enough evidence to support pharmacist counselling for smoking cessation due to the paucity of included studies.</p> <p>Only two randomized controlled trials were included in this review. Findings should be combined with the review by Dent, Harris, and Noonan.</p> <p>The issues regarding lack of good quality studies speak to the need for better control groups and longer follow-up times (e.g., at least 6 months).</p>
	Wong and others ⁴²	Descriptive analysis of administrative data of public drug plan beneficiaries	Ont., Canada	The Pharmacy Smoking Cessation Program gave pharmacists the authority to prescribe smoking cessation medications. The program remunerates community pharmacists for smoking cessation assessment and follow-up visits for public plan beneficiaries. Funding is provided for up to 8 points of contact over 1 year using a fee-for-service scheme. Fees include \$40 for program enrolment and includes readiness assessment and the first consultation, which can occur over 2 visits; \$10—15 per follow-up counselling session (up to 7 sessions). The initial visit takes place	29 per cent of patients with follow-up data had quit at 1 year	Not assessed	<p>Inferior study design, which does not allow for direct comparison of impact with usual care or other program (lacks appropriate control group).</p> <p>Patients were aged 65 years and older or on social assistance (public drug plan beneficiaries); therefore, results may not be comparable to the general population.</p> <p>Follow-up data at 1 year were only available for 12 per cent of the enrolled patients (N=7767).</p> <p>Seasonal and cyclical patterns emerged (e.g., during patient holidays in winter and summer, New Year's resolutions, and pharmacy workload).</p> <p>Authors note that conducting a MedsCheck (medication review) may be an opportunity to offer a readiness assessment to quit smoking.</p>

⁴¹ Sinclair, Bond, and Stead, "Community Pharmacy Personnel Interventions for Smoking Cessation (Review)."

⁴² Wong and others, "Initial Uptake of the Ontario Pharmacy Smoking Cessation Program."

				in the pharmacy while the follow-up visit can occur in the pharmacy or by e-mail, phone, or other means as agreed to by the patient.			
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Source: The Conference Board of Canada

Influenza Vaccination

Although influenza vaccinations by pharmacists in community pharmacy have increased dramatically in Canada in recent years, the research community is only starting to publish evaluation results. However, much of the evidence published to date has focused on evaluating pharmacists' and patient readiness and acceptance or employed secondary analysis of administrative data, which therefore limits the scope of impact assessment (process measurement and administration costs).^{43,44} No studies had reported direct or indirect health outcomes such as reduction of influenza cases or premature mortality, or economic benefits attributable to these health benefits or even in regards to administrative costs compared with a control intervention. (See Table 3 for a summary of selected key evidence.)

An Ontario study reported preliminary analyses of physician and pharmacy billing data, showing a net increase of almost 467,000 influenza vaccinations since community pharmacies could administer them in Ontario, between the years 2011–12 and 2013–14.⁴⁵ Based on this analysis, in addition to net new vaccinations at the population level, there was also a significant shift away from other service settings. Reasons for this shift can be partly explained by convenience, trust, and marketing.^{46,47} Specifically, it was reported that from 2011–12 to 2013–14 about 66,000 fewer vaccines were being conducted at a physician's office and about 156,000 fewer in public health. Similar to tobacco cessation interventions in pharmacy, patients in the Ontario study who went to community pharmacy for influenza vaccination tended to live in neighborhoods with higher incomes and tended to be "healthier" (were less likely to have a chronic disease) compared with patients going to the physician's office for care.

No studies assessed the cost impact of influenza vaccination in pharmacy compared with other settings. However, a recent report by the Ontario Auditor General reported some differences in professional fees across pharmacists, physicians, and in public health.⁴⁸ In the 2013–14 fiscal year, the Ministry of Health and Long-Term Care in Ontario paid \$25 million in total to various providers for administering the influenza vaccine. This includes \$18 million paid to physicians, \$6 million to pharmacies, and \$1 million to public health units. The health care provider reimbursement rates varied: \$5 per dose for public health unit, \$7.50 per dose for pharmacies, and \$9.60 per dose for physicians if the influenza vaccine is all the patient comes in for, and \$4.50 per dose to physicians if otherwise. The report does not differentiate the proportion of influenza vaccinations in physician offices, which were billed at the \$9.60 versus \$4.50 per dose fee.

Some of the emerging research in influenza vaccination in Canada was presented at the Canadian Pharmacists Conference in 2015. The research presented by Alsabbagh and others identified several facilitators and barriers experienced by pharmacists as providers of influenza vaccination based on a survey of pharmacists and pharmacy patrons. They found that for community pharmacists working in the Greater Toronto Area, the highest barriers to pharmacists as vaccinators were pharmacy workflow and staffing. The highest facilitators from the pharmacist perspective included interest in improving patients' health, ability to demonstrate the pharmacist's new role to the public, and the desire to increase patient flow to the pharmacy.

⁴³ Kwong and others, "Community Pharmacies."

⁴⁴ Thomas and Lorezetti, "Interventions to Increase Influenza Vaccination Rates."

⁴⁵ Kwong and others, "Community Pharmacies."

⁴⁶ Papastergiou and others, "Community Pharmacist-Administered Influenza Immunization."

⁴⁷ Alsabbagh and others, "Facilitators and Barriers of Ontario Pharmacists as Providers of Influenza Vaccination."

⁴⁸ Ontario Ministry of Health and Long-Term Care, *Immunization*.

According to pharmacy patrons, the main reason for not going to community pharmacy for influenza vaccination was disinterest in getting vaccinated in general regardless of provider. The facilitators of receiving vaccination from a pharmacist were flexible vaccination hours, short wait time, and the use of a private room to administer the vaccine.

Based on the insights by Alsabbagh and others, opportunities to increase uptake of influenza vaccination in community pharmacy could include logistical supports for pharmacists to address workflow and staffing issues resulting from the integration of new services in the community pharmacy setting. Another opportunity would be to increase awareness that pharmacists can administer influenza vaccination to pharmacy patrons.

Research presented at the conference by Fletcher and others identified characteristics of pharmacists and pharmacies that were associated with becoming certified to administer vaccines in British Columbia.⁴⁹ Since 2009, pharmacists in British Columbia could be certified in vaccine administration with large uptake in the early years of the new policy. The most commonly administered vaccine in the province's pharmacies is the influenza vaccine. The study showed that the most important factors associated with being certified included being a newer pharmacist (having been in practice for fewer years), being a manager or owner of the pharmacy, and working in a chain or food store pharmacy. Pharmacists who owned, managed, or worked in independent pharmacies were less likely to become certified to administer vaccinations in British Columbia.

The study by Houle and others provides an international review of publicly funded remuneration for pharmacist-administered injections.⁵⁰ The authors conducted a literature review and interviews with regulatory and advocacy organizations in four Canadian provinces (Alberta, British Columbia, Ontario, and New Brunswick), all U.S. states, and a number of other countries that have regulations allowing pharmacists to administer injections. Several key insights were demonstrated in this review. First, remuneration rates for vaccination across jurisdictions varied greatly within and across countries. Converted to 2013 Canadian dollars, remuneration averaged \$13.12 per injection with a range of \$4.14 to \$21.21 per injection. Of the Canadian provinces, remuneration for influenza vaccination administered by pharmacists was \$20, \$10, \$7.50, and \$12, in Alberta, British Columbia, Ontario, and New Brunswick, respectively. In this study the authors noted that all jurisdictions covered in the review allowed pharmacists to bill for influenza vaccination. Further patient eligibility in these Canadian provinces included restrictions according to age and/or disease risk. For example, British Columbia, with one of the more conservative vaccination fees for pharmacists, further limits influenza vaccination in pharmacy to the more vulnerable populations, including individuals with high risk of illness or complications, those who are capable of transmitting the disease to those of high risk, and those providing essential community services. Further, each jurisdiction defined different age eligibility for influenza vaccination in pharmacy. For example, any Alberta resident 9 years of age and older could be vaccinated. In contrast, resident-only children and youth (5 to 18 years), seniors (65 years and older) and the chronically ill (5 years and older) are eligible for pharmacist-administered influenza vaccination. The study also looked at other injectable products that could be administered by a pharmacist across jurisdictions. In Canada, Alberta is the only jurisdiction with few restrictions for pharmacists in administering other injectable products (with the exception of travel vaccines) with eligibility criteria including recipients being 5 years and older and pharmacists with a maximum of one fee claim per patient per day. British Columbia has allowed pharmacists to administer pneumococcal vaccine to residents 5 years and older, plus

⁴⁹ Fletcher and others, "Pharmacist and Pharmacy Characteristics."

⁵⁰ Houle and others, "Publicly Funded Remuneration."

anyone age 65 years and older, residents of extended or intermediate care facilities, and individuals who are immune-compromised. The authors recommended that jurisdictions that do not currently allow pharmacists to administer injections should consider adopting new legislated policies and establish remuneration options for pharmacists in order to enhance uptake.

Although the evidence for influenza vaccination in community pharmacy to date is not strong in terms of showing improvements in health outcomes and health system costs, there is a significant amount of data collection and research currently being conducted across Canada since the changes to pharmacy scope came into effect (e.g., two years ago in Ontario). Since influenza vaccinations in pharmacy are currently reimbursed across all Canadian jurisdictions, except for Quebec (see Table 1), and a reasonable expectation of increased uptake across jurisdictions given the trends experienced in Ontario, the scalability of influenza vaccination in community pharmacy can be considered already realized in Canada. However, the health and economic impact of this scale-up is still uncertain and further analysis is required to show the value of scale-up from the perspective of the P/T governments and to society. (See “Patient Experience With Influenza Vaccination.”)

Other Vaccinations

There is some research showing the effectiveness and feasibility of administering other vaccines with some low-quality evidence, such as pneumococcal (pneumonia) and herpes zoster (shingles) vaccinations. The study by Taitel and others aimed to assess whether state-authorized pharmacist immunization privileges in the U.S. would have an effect on pharmacist intervention effectiveness in delivering pneumococcal and herpes zoster vaccinations, compared with states that had restricted authorization or no authorization for pharmacists.⁵¹ The authors also observed whether these privileges would impact population vaccination rates. The results of the study showed that in those states with pharmacist immunization privileges, immunization rates were higher for pneumococcal vaccination and herpes zoster, compared with states that had restricted or no authorization (about 4 percentage points and 0.5 percentage points difference, respectively). Only the pneumococcal vaccination uptake difference was statistically significant. In terms of potential population uptake, the study estimated that there would be a 148 per cent increase in pneumococcal vaccination and 77 per cent increase in herpes zoster vaccination if all states in the U.S. granted pharmacist full immunization authority. This study framed the issue as the potential to improve public health targets in the U.S. through expanded scope of pharmacist practice for immunization privileges.

Although the availability of data is low (the study by Taitel and others), there is potential to model the future impact of expanding pharmacist privileges (in those provinces where this service is not currently authorized) and providing remuneration (to increase implementation and uptake) and/or increasing access in those provinces where the authority exists for pneumococcal or herpes zoster vaccination in Canada.

⁵¹ Taitel and others, “Improving Pneumococcal and Herpes Zoster Vaccination Uptake.”

Table 3. Influenza Vaccination: Selective Summary of the Literature on the Health and Economic Benefits of Pharmacist and Pharmacy Services

Therapeutic area	Study reference	Study design	Regions or countries	Pharmacist or pharmacy intervention	Health benefits	Economic benefits	Challenges and opportunities
Influenza vaccination	Kwong and others ¹	Descriptive analysis of administrative data (physician and pharmacy billing) ¹	Ont., Canada	Pharmacists trained to administer influenza vaccine to patients age 5 years and older in a community pharmacy setting	From 2011–12 to 2013–14, almost 765,000 Ontarians received a flu shot in a community pharmacy, while 66,000 fewer people went to a physician's office and 156,000 fewer people went to a public health unit for their flu shots. There was a net increase of almost 467,000 flu shots administered once community pharmacies were able to provide flu shots to Ontarians.	Not applicable	Patients going to a community pharmacy for the flu vaccine are younger compared to patients going to a physician's office (on average, 52 years vs. 61 years). Slightly more rural patients visit a community pharmacy compared to a physician's office for the flu vaccine (12 per cent vs. 10 per cent). Patients who go to a community pharmacy for the flu vaccine tended to live in neighbourhoods with higher incomes and tended to be "healthier" (i.e., were less likely to have a chronic disease) compared to patients going to a physician's office for the flu vaccine.
	Thomas and Lorenzetti ¹	Systematic review of published studies of randomized controlled trials until June 2014	Study pertaining to community pharmacy in Puerto Rico in 2006	Pharmacist providing education plus vaccination to patients age 60 years and older in a community pharmacy setting	Data analysis from two trials established a combined 3.3-fold increase in vaccination in the intervention group compared to the control group (no intervention)	Not applicable	Focus on seniors population age 60 years and older. Data from Puerto Rico may not be applicable to Canada.
Other vaccinations	Taitel and others ¹	Improving pneumococcal and herpes zoster vaccination uptake by expanding pharmacist privileges	U.S.	State-authorized pharmacist immunization privileges for pneumococcal and herpes zoster vaccination uptake	1-year immunization uptake rates (between August 1, 2011, and March 1, 2012) increased in states with authorized immunization by protocol or prescriptive authority for pharmacists: 148 per cent increase for pneumococcal vaccination and 77 per cent increase for herpes zoster. Total population uptake of pneumococcal vaccination after 1 year was 6.6 per cent in states with pharmacist immunization privileges and 2.5 per cent and 2.8 per cent for states with limited or no authorization (a significant statistical difference).	Not applicable	Key message from this study was that states in the U.S. that offer pharmacists full immunization privileges have higher vaccination uptake rates for pneumococcal and herpes zoster vaccination compared to states with restricted or no authorization. The authors noted that the U.S. public health goals of 2020 regarding pneumonia and shingles could be addressed by expanding pharmacist privileges for these vaccinations in states with limited or no immunization authorization for pharmacists. One of the challenges of this study is that the difference found for shingles vaccination was not significantly different. As well, due to the short

					Total population uptake of herpes zoster vaccination after 1 year was 3.3 per cent in states with immunization privileges and 2.8 per cent in states with no authorization (not a significant statistical difference).		observation time, there was a potential to under-report.
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Source: The Conference Board of Canada.

Patient Experience With Influenza Vaccination

As mentioned earlier, influenza vaccinations are being delivered in many pharmacies across Canada and, as a result, we expect to see more research documenting patient experience as well as uptake in the population. A recent Canadian study by Cheung and others evaluated acceptance of and satisfaction with receiving influenza vaccinations from student pharmacists among 1,555 staff and students at the University of Alberta.⁵² They found that 99 per cent of surveyed participants were satisfied or very satisfied with the service provided and 92 per cent agreed or strongly agreed that based on their experience at the flu clinic, they would be willing to receive vaccinations from a pharmacist in community pharmacy.

Another more recent study by Papastergiou and others⁵³ conducted a survey of clients who received influenza vaccination at four community pharmacies throughout Toronto, Ontario, between October and November 2013. A total of 1,502 surveys were completed among 2,498 patients receiving vaccination during this time period. Based on the survey data, the researchers found that 92 per cent of patients indicated that they were very satisfied with the services they received and with the pharmacists' injection technique. The proportion of patients who reported that they were very comfortable with being vaccinated by a pharmacist was 86 per cent, while 99 per cent reported they would recommend friends and family to be vaccinated by a pharmacist. The main factor contributing to patients' satisfaction was convenience and acceptability, with 46 per cent of participants specifically identifying these factors in their written comments. Among total patients and patients identified as being at high risk for influenza complications, 28 and 21 per cent, respectively, reported that they would have not been immunized this year if pharmacy-based vaccination was not made available.

Cardiovascular Disease and Related Conditions

Pharmacists have been shown to provide valuable care in the prevention and management of cardiovascular diseases and related conditions.⁵⁴ This section reviews the evidence of pharmacist services in the management of select cardiovascular conditions and pre-conditions, including hypertension (high blood pressure), dyslipidemia (high cholesterol), anticoagulation (stroke prevention), and heart failure and diabetes management. Diabetes was included in this therapeutic service category because the appropriate management of diabetes prevents major complications associated with cardiovascular and cerebrovascular events including heart attack and stroke. (See Table 4 for a summary of selected key evidence.)

Hypertension

High blood pressure is one of the most important risk factors for cardiovascular disease, cardiac events, and premature mortality.⁵⁵ The therapeutic area for community pharmacist intervention is for the management of hypertension. This review identified several studies reporting the significant improvement in blood pressure control in patients managed by a pharmacist in a

⁵² Cheung, Cheung, and Banh, *Satisfaction With Student Pharmacists*.

⁵³ Papastergiou and others, "Community Pharmacist-Administered Influenza Immunization Vaccination."

⁵⁴ Santschi and others, "Impact of Pharmacist Care."

⁵⁵ Franklin and Wong, "Hypertension and Cardiovascular Disease."

community setting compared with usual care.^{56,57,58,59,60} Some elements of community pharmacist interventions that appeared to be more effective than usual care include the pharmacist reviewing laboratory results, the pharmacist making medication adjustments, the pharmacist ordering follow-up laboratory tests, and the pharmacist mailing laboratory reminders to patients.

There is also some evidence of the cost-effectiveness of pharmacist intervention for blood pressure control. A study by Houle and others showed community pharmacist interventions managing hypertension could reduce systolic blood pressure by 5.6 mm Hg within six months and associated health system costs could be realized.⁶¹ Costs based on potential avoided cardiovascular events were compared with the costs of the pharmacist-managed intervention, with annual net total cost savings per patient estimated at \$131 for a six-month program or \$115 for a one-year program. This study provides Canadian-specific health and economic information, taking a Ministry of Health (public payer) perspective. The study concludes that community pharmacist collaborative intervention (pharmacist-nurse team) is effective and cost-effective. The study does not, however, include indirect costs (productivity) or outpatient drug costs.

Given the strength of the evidence for health benefits, and some evidence of lower costs for community pharmacist intervention for the management of hypertension, it would be feasible and justifiable to model the scale-up of this therapeutic service.

Dyslipidemia

High blood cholesterol, including low-density lipoprotein (LDL) cholesterol, is also an important risk factor for cardiovascular disease and stroke risk and premature mortality.⁶² Several studies have been published to explore the impact of community pharmacist intervention for the control of dyslipidemia with variable but mostly positive results.^{63,64,65} (See “Team-Based Care and Services Integration.”)

⁵⁶ Cai and others, “Pharmacist Care and the Management of Coronary Heart Disease.”

⁵⁷ Houle and others, “Effect of a Pharmacist-Managed Hypertension Program.”

⁵⁸ Santschi and others, “Improving Blood Pressure Control.”

⁵⁹ Santschi and others, “Evidence for Pharmacist Care.”

⁶⁰ Tsuyuki and others, “Randomized Trial.”

⁶¹ Houle and others, “Effect of a Pharmacist-Managed Hypertension Program.”

⁶² Howard and others, “LDL Cholesterol.”

⁶³ Cai and others, “Pharmacist Care and the Management of Coronary Heart Disease.”

⁶⁴ Charrois, Zolezzi, and Koshman, “A Systematic Review.”

⁶⁵ Santschi and others, “Evidence for Pharmacist Care.”

Team-Based Care and Services Integration

Improvements in health outcomes have been realized in models where pharmacists collaborate with other health professionals to co-manage care of individuals with certain conditions. For example, the co-management by a physician and pharmacist has shown improvements in hypertension control;^{66,67} the addition of pharmacists to primary care teams in Canadian settings has led to better control of blood pressure in patients with type 2 diabetes;⁶⁸ and co-location of pharmacists in general practices has shown improvements in HbA1c, cholesterol, and Framingham risk score.⁶⁹

Community pharmacists have an important role in primary care, and there are many examples where they have forged effective and workable partnerships with other primary care providers. Canadian pharmacists have evidence-based guidelines on how to successfully integrate into primary care teams.

Internationally, stakeholders are examining sustainable avenues to support this type of integration. For example, a large pilot in England launched in the summer of 2015 seeks to encourage new ways of engaging pharmacists in general practices. This initiative will involve 250 clinical pharmacists and is supported by a staged financial arrangement with the public payer. It includes a full evaluation with a knowledge transfer plan to share the lessons learned.

Coronary Heart Disease and Heart Failure

Coronary heart disease (CHD) is characterized as “a disease in which a waxy substance called plaque builds up inside the coronary arteries.”⁷⁰ The condition, over time, can result in cases of angina or heart attack, and possibly death. There is evidence to show the benefits of pharmacist intervention in the community to prevent heart failure through the management of coronary heart disease.⁷¹ In this review we identified two studies that examined the impact of community pharmacist intervention in the management of CHD and heart failure. One of the studies was a review within which only one study was identified to have examined pharmacist intervention for CHD. This one study did not report a link between the intervention and health outcomes specific to reduction in cardiac events or mortality.⁷² However, the other study in our review that examined the impact of pharmacist intervention in heart failure reported that pharmacist care was associated with significant reductions in the rate of all-cause hospitalizations (29 per cent reduction compared with usual care) and a reduction in heart failure hospitalizations (31 per cent reduction compared with usual care). The same study reported that pharmacist collaborative care was associated with 58 per cent reduction in heart failure hospitalization compared with usual care, while pharmacist-directed care was associated with 11 per cent reduction in heart failure hospitalization compared with usual care.⁷³

⁶⁶ Borenstein and others, “Physician-Pharmacist.”

⁶⁷ Tan and others, “Pharmacist Services.”

⁶⁸ Simpson and others, “Effect of Adding Pharmacists.”

⁶⁹ Tan and others, “Pharmacist Services.”

⁷⁰ The National Heart, Lung, and Blood Institute, *What Is Coronary Heart Disease?*

⁷¹ Cai and others, “Pharmacist Care and the Management of Coronary Heart Disease.”

⁷² Ibid.

⁷³ Koshman and others, “Pharmacist Care.”

Although there is some evidence of pharmacist impact on heart failure in terms of reducing health system utilization, there is not enough evidence of scale-up interventions for the purpose of reducing cases of CHD or heart failure at this time. As previously discussed, much of the evidence on community pharmacists in cardiovascular care is strongest for managing cardiovascular risk factors—specifically in managing hypertension and cholesterol. Since hypertension and cholesterol have been directly linked to cardiovascular disease and events, a modelling study could be conducted by the Conference Board using the evidence on pharmacist intervention and hypertension and dyslipidemia to predict the impact on more downstream health events that usually require longer follow-up times or observation.

Diabetes

Unlike a point-in-time blood glucose measure, the HbA1c provides an estimate of glycemic control in patients with diabetes over a three-month period. It allows health care providers to monitor patients intermittently and estimate how well their disease is being managed and whether they require additional interventions to reach or maintain target levels.⁷⁴ Very few studies were identified in our review that examined the impact of pharmacist intervention on blood glucose or hemoglobin A1c (HbA1c). One of the studies in the review by Blalock and others did find a difference between the intervention and control⁷⁵ while the other found an improvement before and after the intervention (20 per cent absolute increase in the number of diabetic patients with controlled HbA1c).

In a more recent study from Alberta, results from the before-and-after design found that a community pharmacist intervention that included pharmacist prescribing showed that more than 50 per cent of patients had their HbA1c controlled (≤ 7 per cent).⁷⁶ The intervention in this study involved community pharmacists systematically identifying potential candidates with type 2 diabetes to test their HbA1c using validated point-of-care technology. A protocol of 10 units of insulin glargine at bedtime, adjusted by increments of 1 unit daily, prescribed by the pharmacists, was used to achieve a morning fasting glucose of ≤ 5.5 mmol/L. The patients were then followed up with at 2, 4, 8, 14, 20, and 26 weeks. The challenge with this evidence is that it does not include an appropriate control such as usual care. Understanding the comparative value of the intervention compared with usual care will allow for the measurement of incremental health and economic benefits of scaling up such an intervention.

One study published in Canada examined the feasibility of doing HbA1c testing in a community pharmacist setting, while discussing the experience with providing clinics in community pharmacies in three locations (Shoppers Drug Marts) in Toronto.⁷⁷ Although this study does not provide evidence for effectiveness, it does describe a program currently being implemented in a Canadian community pharmacy setting, and identifies the barriers and facilitators to achieving desired outcomes. The study describes a pharmacy team that implemented the Bayer A1C Now meter, which can be used by patients in their community pharmacy without a laboratory requisition. HbA1c results can be obtained within five minutes with 99 per cent accuracy.⁷⁸

More evidence is required to show the benefits and costs of HbA1c testing in community pharmacy and the impacts of any other diabetes-related intervention by community pharmacists to control HbA1c. At this time, due to paucity of appropriate evidence (randomized controlled

⁷⁴ Papastergiou and others, "HbA1c Testing in the Community Pharmacy."

⁷⁵ Doucette and others, "Community Pharmacist-Provided Extended Diabetes Care."

⁷⁶ Al Hamarneh and others, "Pharmacist Intervention."

⁷⁷ Papastergiou and others, "HbA1c Testing in the Community Pharmacy."

⁷⁸ Holmes and others, "Analytic Bias Among Certified Methods for the Measurement of Hemoglobin A1c."

trials) of effectiveness and costs, modelingmodelling the scale-up of pharmacist intervention for the control of HbA1c in diabetics may not be substantiated. However, as noted earlier, many of the interventions found to be effective in controlling blood pressure and cholesterol were administered to diabetic patient populations. Therefore, hypertension and dyslipidemia interventions in community pharmacy can be considered priority service areas for high-risk populations, including patients with type 2 diabetes.

Table 4. Cardiovascular Disease and Related Conditions: Selective Summary of the Literature on the Health and Economic Benefits of Pharmacist and Pharmacy Services

Therapeutic area	Study reference	Study design	Regions or countries	Pharmacist or pharmacy intervention	Health benefits	Economic benefits	Challenges and opportunities
Hypertension	Cai and others ⁷⁹	Systematic review of studies published until July 2012, with follow-up in 12 months and 2 years	U.S. and England (included studies on hypertension)	<p>In each included study:</p> <ul style="list-style-type: none"> • review of laboratory results, blood pressure, medications and adherence, counselling on diet and exercise regimens, adjusting medications, ordering follow-up laboratory tests, and mailing laboratory reminder letters for patients; • consultation of therapy, medication compliance, lifestyle and social support provided by the community pharmacist, with recommendations then recorded and sent to the general practitioner, who returned annotated copies to the pharmacist 	<p>Blood pressure control (<140 mmHg) in one study with pharmacist intervention compared to usual care (plus laboratory reminder letters) after 2 years</p> <p>No significant improvement in intervention group compared to the control group in one study after 12 months</p>	Not applicable	<p>Patients had coronary heart disease (previous myocardial infarction, angina, or coronary artery bypass graft or coronary artery disease), as well as uncontrolled blood pressure levels. Only two studies examined pharmacist impact on blood pressure control, with one study finding a significant difference in more patients with controlled blood pressure in the intervention group. Differences in interventions between study finding effectiveness vs. study finding no effectiveness include:</p> <ul style="list-style-type: none"> • follow-up time (2 years vs. 12 months) • pharmacist review of laboratory results • pharmacist makes medication adjustments • pharmacist orders follow-up laboratory tests • pharmacist mailed laboratory reminders to patients <p>Study finding effectiveness of pharmacist intervention had a relatively small sample size compared with study finding no significant results. Review authors conclude more studies are needed to confirm the effectiveness of community pharmacy in the control of blood pressure.</p>
	Houle and others ⁸⁰	Economic modelling study	Canada	<p>In pharmacist management hypertension program, two programs were evaluated:</p> <ul style="list-style-type: none"> • monthly follow-up for 1 year with sustained blood pressure reduction; 	The SCRIP-HTN study found that patients with diabetes mellitus and hypertension who were benefiting from	Annual estimated cost savings (in 2011 Canadian dollars) from avoided	Study provides Canadian-specific health and economic information, taking a Ministry of Health (public payer) perspective. Study concludes that community pharmacist collaborative intervention

⁷⁹ Cai and others, "Pharmacist Care and the Management of Coronary Heart Disease."

⁸⁰ Houle and others, "Effect of a Pharmacist-Managed Hypertension Program on Health System Costs."

				<ul style="list-style-type: none"> care by pharmacist ended after the 6-month program but the effects on systolic blood pressure diminished over time. In the SCRIP-HTN study, the intervention group received cardiovascular risk reduction counselling by a pharmacist–nurse team along with a hypertension education brochure. Patients were provided a wallet card documenting their blood pressures and were encouraged to visit their primary care physician for cardiovascular risk assessment. Patients followed up every 6 weeks, with the assessment results sent to each patient's primary care physician. <p>Control group: blood pressure wallet card, pamphlet on diabetes, and general diabetes counselling</p>	pharmacist intervention had a greater mean reduction in systolic blood pressure of 5.56 mmHg than patients receiving usual care.	cardiovascular events were \$265/patient if the program lasted 1 year or \$221/patient if pharmacist care ended after 6 months with an assumed loss in the effect. Estimated pharmacist costs were \$90/patient for 6 months or \$150/patient for 1 year, suggesting that pharmacist-managed programs do save costs, with the annual net total cost savings per patient estimated to be \$131 for a program lasting 6 months or \$115 for a program lasting 1 year.	(pharmacist–nurse team) was beneficial and cost-effective. The study does not, however, include indirect costs (productivity) or outpatient drug costs. Opportunities include using a similar modelling approach but including productivity costs using effectiveness data for other pharmacy service models.
	Santschi and others ⁸¹	Systematic review of studies published until November 2010. Two studies focused on community pharmacy intervention to control hypertension, with follow-	Portugal and U.S. (included studies on hypertension and in community pharmacy)	<p>In each study :</p> <ul style="list-style-type: none"> Pharmaceutical care program included monthly measurement of blood pressure; hypertension and lifestyle habits education and counselling; identification of drug-related problems; laboratory tests if necessary (compared to usual pharmacy services such as dispensing, brief counselling, medication 	One study found a significant difference in systolic and diastolic blood pressure levels in pharmacist intervention group compared to the control group. One study found no significant difference between the intervention and control groups for systolic blood		Two studies examined the impact of pharmacist-directed care in a community pharmacy to manage patients' hypertension. Both studies had relatively small sample sizes. The study that did not find a significant difference between the intervention and control groups had a sample size of 125; the study with significant findings had a sample size of 82. This study focuses on mean differences in blood pressure between the intervention and control groups as opposed to establishing

⁸¹ Santschi and others, "Impact of Pharmacist Care in the Management of Cardiovascular Disease Risk Factors."

		up times ranging from 3 to 6 months.		<p>review, and monitoring for adverse drug reactions.</p> <ul style="list-style-type: none"> Education of hypertension medication, disease, home blood pressure technique; distribution of home blood pressure device; suggestion of drug adherence aids if necessary; written treatment recommendations to physician regarding intensification of medication regimen; contact with physician to develop treatment plan; patient education related to treatment plan (compared to usual care services such as meeting with pharmacist, blood pressure measurement, no education; no home blood pressure monitors; no written recommendations; no contact with physician. 	<p>pressure but did find a significant difference in diastolic blood pressure levels. Pooled results for all pharmacist studies for hypertension (systolic blood pressure control) showed a significant difference between the intervention group and the control group (mean difference of 8.05 mm Hg).</p>		<p>rates of blood pressure control, which in some cases may be a better predictor of cardiovascular risk.</p>
	Santschi and others ⁸²	Systematic review and meta-analysis of studies published until September 2013. Follow-up included studies in community pharmacy and ranged from 5 to 13 months.	U.S. and Canada (included studies in community pharmacy that were updates to the 2011 review by the same authors)	<p>Community pharmacy interventions in four additional studies to the review by Santschi and others are described below.</p> <p><u>Pharmacist-directed interventions:</u></p> <ul style="list-style-type: none"> Pharmacotherapy follow-up program included patient interviews regarding medications, health issues, and lifestyle; patient education regarding diabetes, lifestyle (physical activity, healthy 	<p>Two studies (pharmacist-led) showed significant improvements in blood pressure levels, with a mean reduction difference of 15.0 mmHg and 20.1 mmHg in the pharmacist-led intervention group compared to the control group. Pharmacist-led study showed no significant improvement in the intervention group</p>	Not applicable	<p>Total of six studies examined the impact of community pharmacy on blood pressure in hypertensive patients, of which four studies were additional to the previous review conducted by Santschi and others. All four studies looked at diabetic patients with uncontrolled blood pressure as the intervention population. Three of four studies examined a pharmacist-directed intervention in community pharmacy. One study examined pharmacist collaboration with a nurse in a community pharmacy setting. In most interventions, pharmacists' ability to review and modify or</p>

⁸² Santschi and others, "Evidence for Pharmacist Care in the Management of Hypertension."

				<p>diet, smoking cessation) and medication; distribution of verbal and written information about the correct use of medication; and detection and resolution of drug-related problems.</p> <ul style="list-style-type: none"> • Multiple scheduled educational appointments included patient education and empowerment; and a progress note to patient's physician by fax, e-mail, or mail after each visit • A community-based medication therapy management (MTM) program included medication review related to current prescribed and non-prescribed medication to identify drug-related problems; the identification of drug-related problems; if found, , recommendations to physicians regarding adjustment to the medication dose and additional medication were faxed or phoned in; patient education regarding medication, lifestyle, and diet; and a copy of the visit note was sent to the physician. <p><u>Pharmacist collaborative care:</u></p> <ul style="list-style-type: none"> • Pharmacist-nurse team included patient education and counselling about cardiovascular risk reduction; distribution of hypertension education pamphlet and wallet card documenting recorded 	<p>compared to the control group. Pharmacist-collaborative care study showed significant improvement in blood pressure levels, with a mean reduction difference of 5.5 mmHg in the intervention group compared to the control group. Overall review estimates with pharmacist-directed interventions (all settings) showed significant improvement in blood pressure in the intervention group, with a pooled weighted mean reduction difference of 8.5 mmHg. Overall review estimates with pharmacist collaborative care interventions (all settings) showed significant improvement in blood pressure in the intervention group, with a pooled weighted mean reduction difference of 6.3 mmHg. All pharmacist interventions (directed and collaborative) in all settings showed a mean reduction difference of 7.6 mmHg between the intervention and control groups.</p>	<p>consult with physician to modify medications was common in design. Counselling/education on disease, medications, and lifestyle were also common across many interventions. Pharmacist-led interventions (in all settings) were slightly more effective in controlling blood pressure than pharmacist collaborative care in this review. Opportunities include more research that examines the benefits of pharmacist collaborative care in community pharmacy.</p>
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				<p>patient blood pressure measures faxed to physicians; patient's risk factors, current medications and blood pressure measures with any suggestions for further management based on guidelines faxed to physicians. Team members: nurse.</p>			
	<p>Tsuyuki and others⁸³</p>	<p>Randomized controlled trial with follow-up in 6 months</p>	<p>Alta., Canada</p>	<p>Pharmacist intervention in community pharmacy included an assessment of blood pressure and cardiovascular risk; education on hypertension; prescribing of anti-hypertensive medications; laboratory monitoring; and monthly follow-up visits for 6 months (compared to the control group of patients receiving wallet card for blood pressure recording, written hypertension information, and usual care from their pharmacist and physician).</p>	<p>A significant mean reduction difference in systolic blood pressure at 6 months, of 6.6 mmHg in the intervention group compared to the control group. Intervention patients were more than twice as likely to achieve blood pressure targets (odds ratio = 2.32).</p>	<p>Not applicable</p>	<p>Study subjects all had above-target blood pressure levels according to Canadian guidelines. Strong study results in a short follow-up period of just 6 months. Study setting provides strong contextual support for scaling up. There were challenges and opportunities in identifying the key enablers or facilitators for implementing this intervention more broadly and whether success outcomes can be achieved outside a randomized controlled trial environment. The study authors noted that the study subjects were self-selected and therefore were more motivated and more likely to respond well to the intervention than the general population. Enabling factors identified in the study include: pharmacists' prescribing authority (anti-hypertensive drugs); having a separate room to conduct measurements; and funding support/financial incentives (study had pharmacist payment in the form of fee for service or pay for performance). Opportunities include further evaluation of these types of models in Canada and the use of pending results from the sub-study on remuneration models. The authors conclude that medication management with prescribing authority for pharmacists</p>

⁸³ Tsuyuki and others, "Randomized Trial of the Effect of Pharmacist Prescribing."

							is effective in addressing clinical inertia in hypertension management.
Dyslipidemia	Cai and others ⁸⁴	Systematic review of studies published until July 2012, with follow-up at 2 years, 42 months	U.S. (included studies on dyslipidemia)	<p>In each study:</p> <ul style="list-style-type: none"> Pharmacist telephoned patients to emphasize the importance of therapy; asked patients about when and where prescriptions were filled, how they paid for their prescriptions, potential side effects, overall well-being, and specific reasons for non-compliance when applicable. Pharmacist managed lipid-lowering drug therapy; educated patients on cardiovascular risk reduction; and communicated the medication regimen to the responsible physician. Pharmacist reviewed laboratory results, blood pressure, medications, and adherence; counselled on diet and exercise regimens; adjusted medications; ordered follow-up laboratory tests; and mailed laboratory reminder letters for patients. 	Two studies found a significant difference in patients with LDL cholesterol controlled at target levels (≤ 100 mg/DL) with pharmacist intervention compared to the control group (counselling of appropriate use of drugs, dietary instruction, usual care).	Not applicable	<p>Patients had coronary heart disease (previous myocardial infarction, angina, coronary artery bypass graft, or coronary artery disease), as well as uncontrolled cholesterol levels. Only three studies examining pharmacist impact on LDL cholesterol control. Two studies found a significant difference, with more patients with controlled LDL cholesterol in the intervention group. Differences in interventions between studies finding effectiveness vs. study finding no effectiveness are not clear. The results are mixed and it is difficult to determine which specific aspects of each intervention had an impact on lowering LDL cholesterol in patients. Review authors concluded that more studies are needed to confirm the effectiveness of community pharmacy in the control of LDL cholesterol.</p>
	Charrois, Zolezzi, and Koshman ⁸⁵	Systematic review of studies published until February 2010, where six studies	U.S., Canada, Chile, Spain, Netherlands (included studies focusing on community pharmacy)	<p>Community pharmacy interventions included:</p> <ul style="list-style-type: none"> education, drug therapy recommendations, drug changes by protocol, adherence assessment, and collaborative approach to care (one 	Patients in pharmacist intervention groups (all settings) were 2.5 times more likely to achieve target lipid levels compared to patients receiving standard care.	Not applicable	<p>All study patients had dyslipidemia. One study had patients with diabetes. There were greater benefits in LDL level reduction with interventions involving collaborative care (pharmacists working in teams or collaboratively with other health care providers). This finding is</p>

⁸⁴ Cai and others, "Pharmacist Care and the Management of Coronary Heart Disease."

⁸⁵ Charrois, Zolezzi, and Koshman, "A Systematic Review of the Evidence for Pharmacist Care of Patients With Dyslipidemia."

		focusing on community pharmacy had follow-up ranging from 6 to 13 months.		<p>study);</p> <ul style="list-style-type: none"> • education, laboratory tests ordered, drug therapy recommendations, and independent pharmacist intervention (one study); • education, laboratory tests ordered, and independent pharmacist intervention (one study); • education, drug therapy recommendations, adherence assessment, and independent pharmacist intervention (two studies); • education, laboratory tests ordered, adherence assessment, and independent pharmacist intervention (one study). 			consistent with other studies that have found pharmacists to be more effective in teams than when they work independently. Only 1 of 6 community pharmacist interventions included in the review involved a collaborative care approach. More studies looking at how best practices for optimizing collaborative care in a community pharmacy practice are required. The study using a collaborative care model in a community pharmacy setting where the pharmacist led the intervention involved collaboration with patients' physicians. Details on the collaborative component to care were not included.
	Santschi and others ⁸⁶	Systematic review of studies published until November 2010, where two studies focused on community pharmacy intervention to control LDL cholesterol or total cholesterol, with follow-up times ranging from 6 weeks to 6 months.	U.S. and Chile (included studies focused on community pharmacy for the control of LDL cholesterol)	<p>In each study:</p> <ul style="list-style-type: none"> • Pharmacist-directed lipid management program included education (potential adverse effects and goals of medication therapy) and counselling of medication and lifestyle; assessment of cholesterol levels; assessment of medication compliance (refill history and patient's discussion); and communication with physician for drug-related problems via fax, letters, and phone calls, compared to usual care involving just counselling. • Pharmacist-directed pharmaceutical care program included medication counselling 	One study found significant improvement in total cholesterol in the intervention group compared to the control group (25.7 mg/dL mean difference in total cholesterol reduction). One study found no benefit in lower LDL or total cholesterol in the intervention group compared to the control group. In fact, the results in this study favoured the control group. Review results for all studies (pharmacy intervention in all settings) showed significant	Not applicable	Two studies examined the impact of pharmacist-directed care in a community pharmacy setting to manage patients' dyslipidemia. Both studies had a very small sample size, with about 50 patients in each trial. Each study is relatively old (published in 2000 and 2005). Review authors concluded that pharmacist-led interventions for dyslipidemia in outpatient settings are the most effective for lowering total cholesterol and LDL cholesterol compared with the control group receiving usual care. Future research on the community pharmacy setting should include longer follow-up times and larger sample sizes in order to achieve more confident results. Opportunities for the development of effective interventions in a community pharmacy setting should address barriers and facilitators in community pharmacy vs. outpatient

⁸⁶ Santschi and others, "Impact of Pharmacist Care in the Management of Cardiovascular Disease Risk Factors."

				and education (brochures about disease and lifestyle); identification and resolution of drug-related problems; and referral to physician, compared to usual care involving just counselling by a pharmacist.	improvement in total cholesterol and LDL cholesterol (17.4 mg/DL and 13.4 mean reduction, respectively) compared to the control group.		settings.
Coronary heart disease and heart failure	Cai and others ⁸⁷	Systematic review of studies published until July 2012, with follow-up times ranging from 6 months to 2 years.	U.S., U.K.	Included patient education, medication management, feedback to health care professionals, and disease management.	Could not link interventions to cardiac events or mortality.	Not applicable	Issues with establishing the contribution of pharmacists toward reducing coronary heart disease. More research is required to establish longer-term outcomes of sustained interventions.
	Koshman and others ⁸⁸	Systematic review of studies published until August 2007	Canada, Northern Ireland, Spain, U.K., United Arab Emirates, U.S., Australia	Pharmacist-directed care (seven studies) with responsibility over medication and heart failure education, self-monitoring, recommendations to physicians, and adherence aids. Pharmacist as a member of a multidisciplinary team (five studies). Variety of pharmacist interventions across studies, including: <ul style="list-style-type: none"> • medication education; • medication adherence assessment; • self-monitoring; • collaboration/liaison with family physician, nurse, educator, nutritionist, and physical therapist; • dietary counselling. 	Pharmacist care associated with significant reductions in rate of all-cause hospitalizations (29 per cent reduction). Pharmacist care associated with reduction in heart failure hospitalizations (31 per cent reduction). Pharmacist collaborative care associated with 58 per cent reduction in heart failure hospitalization. Pharmacist-directed care associated with 11 per cent reduction in heart failure hospitalization.	Not applicable	Pharmacist collaborative care is more effective than pharmacist-led care, although both types of care were effective in reducing heart failure hospitalizations. All programs involve pharmacists in medication education and adherence. No significant impact on mortality (although there is a trend towards significance). Study authors felt evidence was strong enough to recommend that pharmacists should work in health care teams for the management of heart failure.
Diabetes	Al Hamarneh and others ⁸⁹	Before-and-after study	Alta., Canada	Pharmacists systematically identified potential	51 per cent of the patients achieved the	Not applicable	This is the first completed study of independent prescribing by

⁸⁷ Cai and others, "Pharmacist Care and the Management of Coronary Heart Disease."

⁸⁸ Koshman and others, "Pharmacist Care of Patients With Heart Failure."

				candidates by inviting patients with type 2 diabetes to test their HbA1c using validated point-of-care technology. Pharmacists prescribed 10 units of insulin glargine at bedtime, adjusted by increments of 1 unit daily to achieve a morning fasting glucose of ≤ 5.5 mmol/L. The patients were followed up at 2, 4, 8, 14, 20, and 26 weeks.	target HbA1c of $\leq 7\%$ at the end of the study.		pharmacists in Canada that looks at HbA1c in the diabetic (type II) population with uncontrolled HbA1c. The impact of the intervention was explained by the prescribing authority (insulin) of the pharmacist and improved adherence to the treatment regimen. Although results are promising, the lack of appropriate comparators makes it difficult to discern the comparative value of this intervention. Future research should incorporate an appropriate control group.
	Blalock and others ⁹⁰	Systematic review of studies published until December 31, 2011		Most of the interventions involved disease or medication management and refill reminders.	In before-and-after design studies or the non-randomized comparison group, the following results were evident: There was an average 1 per cent decline in HbbA1c over time. In one study, the percentage of patients with optimal HbA1c improved from less than 40 per cent at baseline to more than 60 per cent at follow-up. One randomized controlled trial did not find a significant difference in HbA1c improvement between the intervention and control groups.	Not applicable	

Source: The Conference Board of Canada.

⁸⁹ Al Hamarneh and others, "Pharmacist Intervention for Glycaemic Control in the Community."

⁹⁰ Blalock and others, "The Effect of Community Pharmacy-Based Interventions on Patient Health Outcomes: A Systematic Review."

Asthma and COPD

Although several studies have reviewed the impact of community pharmacist intervention on asthma and/or COPD, few have employed a research design that examines the intervention's impact on health outcomes or costs. Table 5 provides a summary of selected evidence on respiratory conditions, specifically asthma and COPD.

The few studies looking at community pharmacist intervention, specifically their role in providing patients with education materials and resources, counselling patients on inhalation technique, and overseeing medication adherence, found benefits of community pharmacist intervention on health system utilization outcomes as well as health outcomes in terms of respiratory peak flow rates and inhalation score.^{91,92}

One recent study from Quebec evaluated the impact of pharmacist intervention on recommendations made to the patient, satisfaction, and barriers and facilitators to implementing the program.⁹³ The pharmacists in this pilot study worked a minimum of 20 hours per week at the pharmacy and received \$50 for each subject recruited. Prior to the program, participating pharmacists had to complete a short continuing education lesson on the management of asthma and COPD. Pharmacists used a standardized approach to assess patients, during which they reviewed the role of respiratory medication, checked inhalation techniques, assessed disease control/severity, identified potential drug-related problems, evaluated medication adherence, and completed referrals to an asthma or COPD educator. The pharmacist would then provide a summary to each patient's physician, with recommendations where appropriate. Although health outcomes data were not collected and reported in this study, some of the study insights in relation to the feasibility and potential uptake of the program on a larger scale are informative. Specifically, the study reported lack of time to be a barrier to interventions in asthma by pharmacists and in order to overcome this barrier, pharmacists might delegate some tasks to pharmacy interns, pharmacy technicians, or nurses employed at the pharmacy.

Further research on the role and impact of community pharmacists and pharmacy on asthma and COPD management is required to make any conclusions on intervention effectiveness or cost-effectiveness. The evidence of effectiveness to date is not strong enough to warrant evaluation of potential scale-up at this time. However, there is high potential for population impact given recent estimates of high hospital readmission rates for COPD in Canada. According to a report by the Canadian Institute for Health Information (CIHI) in 2012, patients were most likely to be readmitted for COPD and heart failure, with more than two in five of these patients returning to hospital for the same condition.⁹⁴ The report also found that the highest volume of readmission among pediatric patients was for respiratory infection and pneumonia.

⁹¹ Blalock and others, "The Effect of Community Pharmacy-Based Interventions on Patient Health Outcomes."

⁹² Tommelein and others, "Effectiveness of Pharmaceutical Care."

⁹³ Beauchesne and others, "Community Pharmacy-Based Medication Assessment Program."

⁹⁴ Canadian Institute for Health Information, *All-Cause Readmission to Acute Care*.

Table 5. Respiratory Conditions: Selective Summary of the Literature on the Health and Economic Benefits of Pharmacist and Pharmacy Services

Therapeutic area	Study reference	Study design	Regions or countries	Pharmacist or pharmacy intervention	Health benefits	Economic benefits	Challenges and opportunities
Asthma and COPD	Blalock and others ⁹⁵	Systematic review of studies published until December 31, 2011	U.S. (one study)	The pharmaceutical care program provided pharmacists with recent patient-specific clinical data including peak expiratory flow rates (PEFRs), emergency department visits, hospitalizations, and medication compliance), training, customized patient educational materials, and resources to facilitate program implementation. The PEFR monitoring control group received a peak flow meter, instructions about its use, and monthly calls to elicit PEFRs. PEFR data were not provided to the pharmacist. Patients in the control group received neither peak flow meters nor instructions on their use; during monthly telephone interviews, PEFR rates were not elicited. Pharmacists in both control groups had a training session but received no components of the pharmaceutical care intervention.	One randomized controlled trial found a significant improvement in peak flow rate among patients in the intervention group compared with the control group (mean = 63.7% vs. 61.8%). However, peak flow rate did not differ between patients in the intervention group and patients in a second control group that received basic instruction concerning peak flow monitoring.	Not applicable	Individual study evaluated the effect of disease management on peak flow rate in patients with asthma and chronic obstructive pulmonary disease. Intervention appeared to be complicated with a requirement to provide a lot of support for pharmacists. Whether this feasible to scale-up is difficult to determine. Pharmacists were paid \$50 per month for high rates of compliance with the pharmaceutical care protocol (viewing data on the study computer for ≥90% of patients and documenting actions for ≥75% of patients). Reduction in hospital visits and hospitalizations show potential for system cost savings attributable to better care outcomes but costs savings in terms of administration not evaluated.
COPD	Tommelein and others ⁹⁶	Randomized controlled trial	Belgium	Protocol-defined pharmacist care involving interventions focusing on inhalation technique and adherence to maintenance therapy.	At the end of the trial, the inhalation score (mean difference of 13.5 per cent) was significantly higher in the intervention group compared to the control group. Significantly lower hospitalization rate was observed (9 vs. 35—a 72 per cent rate reduction) in the intervention compared to the control group.	Not applicable	Study subjects were prescribed daily COPD medication, aged ≥ 50 years, and had smoking history ≥ 50 years. There were challenges as a result of generalizing to the Canadian context. Further research on community pharmacist COPD intervention needed as well as assessment of the implications on health care costs and productivity.

Source: The Conference Board of Canada

⁹⁵ Blalock and others, “The Effect of Community Pharmacy–Based Interventions on Patient Health Outcomes: A Systematic Review.”

⁹⁶ Tommelein and others, “Effectiveness of Pharmaceutical Care for Patients With Chronic Obstructive Pulmonary Disease.”

Neuropsychological (Brain) Health

Although evidence to date is sparse, some studies have shown a beneficial role for community pharmacists in the management of mental health and neurological conditions (specifically Parkinson's disease). This section briefly touches upon some of the evidence published to date. With increasing prevalence of mental health conditions including depression and rise in degenerative, neurological disorders with an aging population, pharmacists may play a larger role in meeting the evolving health care demands associated with these changing demographics. (See "Pharmacist and Pharmacy Specialization.")

Mental Health

Of note is the lack of evidence for pharmacist intervention for the management of mental illness in the community setting. One systematic review identified in the literature search focused on mental health intervention provided by a clinical pharmacist in an inpatient, hospital setting only.⁹⁷ The review found some evidence supporting the effectiveness and economic benefits of pharmacy services inpatient mental health; however, due to the paucity of evidence, no firm conclusions can be made nor any extrapolation could be made to a pharmacist intervention in other community settings.

A narrative review by Rubio-Valera and others published in 2014 identified the opportunities for community pharmacy in delivering mental health services, including the community pharmacist's role in multidisciplinary teams and in supporting early detection of mental illness, as well as their role in medication review, and in improving medication adherence and antipsychotic polypharmacy—the simultaneous use of multiple drugs by an individual for one or more health conditions.⁹⁸ The review mentions several studies that have shown positive effects of the integration of pharmacists into multidisciplinary teams to care for individuals living with mental illness but also cites the need for more evidence in this area. They also discuss the benefits of community pharmacy's high accessibility, providing consumers with the opportunity to seek medical advice without needing an appointment or having to experience long wait times. The review also discusses the Collaborative Drug Therapy Management (CDTM) model of collaborative care, which is an agreement between the pharmacists and the physicians allowing pharmacists to conduct patient assessments, select and adjust drug regimens, as well as monitor and track patients' pharmacotherapy results. There has been evidence to show that CDTM is effective in identifying and addressing medication-related problems in mental health settings.⁹⁹ In the context of helping individuals with mental health issues, pharmacists' involvement in patient education, changes of dosage and restart, and change or addition of drugs, demonstrate an area of potential for pharmacy services scope, but requires further research.

The review by Rubio-Valera and others also identified several challenges for pharmacists' role in mental health. For example, although pharmacists could potentially provide depression screening services in the community, stigma (self and from health professionals) can be a barrier to effective implementation. Other barriers include lack of pharmacist personnel time to conduct the screenings, concerns regarding lack of privacy, and inadequate remuneration or reimbursement for pharmacist services.

⁹⁷ Richardson, O'Reilly, and Chen, "A Comprehensive Review."

⁹⁸ Rubio-Valera, Chen, and O'Reilly, "New Roles for Pharmacists."

⁹⁹ Moczygemba and others, "Integration of Collaborative Medication Therapy Management."

The amount of evidence for mental health as a therapeutic service area in community pharmacy is currently too low, with an apparent slow trend toward more research in the near term. Mental health services in community pharmacy, although a potentially emerging area, may not be considered a good candidate for scale-up at this time.

Parkinson's Disease

Although very few studies have been published on the role of pharmacists in the management of Parkinson's disease, there is some good evidence to support pharmacist services in the community, specifically in detecting and reducing problems associated with drug treatment.^{100,101,102} Virtually all studies examining this therapeutic area are from Europe, specifically Germany and Switzerland. These studies showed the effectiveness of pharmacists in identifying drug-related problems, providing patient treatment advice, and making adjustments to drug regimens. The opportunities identified in the management of drug-related problems in Parkinson's disease may be within the context of medication review and management for the older adult population. Services provided within the community may extend beyond the community pharmacy, including in-home care and long-term care homes, an emerging area for pharmacist services for the aging population.

Due to the paucity of evidence and the slow increase in the number of new studies over the past several years, community pharmacist services to address drug-related problems in Parkinson's disease may not be considered a good candidate for scale-up at this time. It would be worth tracking over time the number of new studies on this therapeutic area internationally and domestically. With the aging population, the risk of age-related disease, including Parkinson's, is likely to increase.

Pharmacist and Pharmacy Specialization

Significant condition-specific opportunities to leverage the skills, expertise, and expanded scope of pharmacists in community settings also exist. The prevention and management of cardiovascular disease and associated risk factors, including hypertension, appear to be a promising area. For example, research by Houle and others on the use of blood pressure kiosks in community pharmacies suggest how pharmacists can be engaged in screening and management of hypertension. (See previous section on hypertension.) Referral systems to specialist pharmacies and pharmacists could be established.

Medication Review and Management

Generally, a medication review is a patient-care service provided by a health care provider, such as a pharmacist, to optimize patient understanding of their medication regimen and to improve their health outcomes as a result. Medication management, on the other hand, involves the active involvement of the pharmacist to provide patient-centred care to optimize safe, effective, and appropriate drug therapy, including review of potential adverse drug reactions.¹⁰³ Therapeutic programs such as these are much more complex than traditional pharmacy

¹⁰⁰ Schröder and others, "Drug-Related Problems in Parkinson's Disease."

¹⁰¹ Schröder and others, "Impact of Community Pharmaceutical Care."

¹⁰² Krähenbühl and others, "Practical Evaluation of the Drug-Related Problem Management Process."

¹⁰³ Canadian Pharmacists Association, *Blueprint for Pharmacy*.

services, as they require an assessment of the patient's medications and health conditions, the identification of drug therapy problems, the development of a care plan, and the necessary follow-up.¹⁰⁴ Medication management by a pharmacist should not be done in isolation but as part of an active care, medication review process in collaboration with patients and their other health care providers or health care team.

For many of the therapeutic service areas discussed previously, medication review and management can play an important role in the optimization of the use of drugs, the maintenance and improvement of health outcomes in patients, and health care system costs. The evidence of the impact of medication review and management is numerous; however, studies published are varied in terms of patient populations/inclusion criteria, the design of the intervention, and the health and economic outcomes.

As pharmacists undertake expanded roles and provide services beyond dispensing, evidence is emerging on the effectiveness of some activities.¹⁰⁵ Medication adherence is complex and tied to many factors beyond pharmaceutical care. There is some evidence that medication reviews can improve medication adherence and outcomes.¹⁰⁶ A recent review of systematic reviews suggests promise in medication management interventions by pharmacists including medication reviews, and care services including care plan development and follow-up.¹⁰⁷ Furthermore, there is evidence finding technology-assisted pharmacist interventions effective in reducing medication errors.¹⁰⁸ See Table 6 for a summary of key evidence on medication reviews and medication management.

¹⁰⁴ Canadian Pharmacists Association, *Medication Review Services Prospectus*.

¹⁰⁵ Nkansah and others, "Effect of Outpatient Pharmacists' Non-Dispensing."

¹⁰⁶ Hatah and others, "A Systematic Review."

¹⁰⁷ Ryan and others, "Interventions to Improve Safe and Effective Medicines Use."

¹⁰⁸ Avery and others, "A Pharmacist-Led Information Technology Intervention."

Table 6. Medication Review and Management: Selective Summary of the Literature on the Health and Economic Benefits of Pharmacist and Pharmacy Services

Study reference	Study design	Regions or countries	Pharmacist or pharmacy intervention	Health benefits	Economic benefits	Challenges and opportunities
Avery and others ¹⁰⁹	Randomized controlled trial with 6 months follow-up.	U.K.	A pharmacist-led information technology intervention (PINCER) versus computer-generated simple feedback for at-risk patients in general medical practice or primary care (control group)	<p>Patients in intervention group were 42 per cent likely to have been inappropriately prescribed a non-selective NSAID (had a history of peptic ulcer without gastro-protection) compared to the control group.</p> <p>Patients in intervention group were 27 per cent less likely to be prescribed a β blocker if they had asthma.</p> <p>Patients were 49 per cent less likely to be prescribed an ACE inhibitor or loop diuretic without appropriate monitoring</p>	The intervention has a 95 per cent probability of being cost-effective if the decision-maker's (payer's) ceiling willingness to pay reaches \$155 CAD per error avoided at 6 months.	<p>This intervention, which is heavily dependent on technology, would only work in the context of patients having electronic medical records between general practice and pharmacy. The intervention itself was applied at the general practice as opposed to community pharmacy, although this intervention could be applied to the community pharmacy but only with the use of an electronic medical record, which is not prevalent in pharmacies across Canada. This will limit being able to generalize to the Canadian context.</p> <p>The simple feedback used as a control in this study is superior to routine models of care used in the U.K. Therefore, the true effect size of the intervention in comparison to standard care might have been underestimated.</p> <p>The outcome of interest in this study was avoidance of medical errors as opposed to adverse events. Therefore, the authors cannot be certain whether the pharmacist-led intervention would reduce harm to patients.</p>
Gnjidic and others ¹¹⁰	Review	Various	<p>Interventions to reduce polypharmacy; prescribing/ deprescribing</p> <p>Specific interventions in pharmacist-based interventions include:</p> <ul style="list-style-type: none"> clinical pharmacist medication review combined with physician and patient education; clinical pharmacist consultation and 	<p>One of four studies found an impact on outcomes, with the medication review performed by pharmacist and reviewed by the primary care provider resulting in a neutral or positive in 99.5 per cent of cases.</p> <p>Prescribing impact of pharmacist-based interventions include significant reduction in the number of prescriptions, and number and costs of</p>	Not applicable	Evidence of clinical effectiveness and sustainability of reducing medication exposure is conflicting and lacking. Larger randomized controlled trials are required to evaluate interventions on clinical outcomes of changes in medicine regimens used in different settings.

¹⁰⁹ Avery and others, "A Pharmacist-Led Information Technology Intervention."

¹¹⁰ Gnjidic and others, "Deprescribing Trials: Methods to Reduce Polypharmacy."

			<p>computer-based medication profiles provided to physician;</p> <ul style="list-style-type: none"> • clinical pharmacist patient-tailored medication review provided to physician; • medication review performed by pharmacist and reviewed by primary care provider. 	medications.		
Hatah and others ¹¹¹	Systematic review and meta-analysis of studies published until February 2011	Various	Fee-for-service medication review by pharmacists including adherence review, clinical medication review, clinical medication review and prescribing	<p>Blood pressure control—3.5 times more likely to attain target levels compared to the control group.</p> <p>LDL cholesterol—2.3 times more likely to attain target levels compared to the control group.</p> <p>Hospitalization—no significant difference between the intervention and control groups.</p> <p>Mortality—no significant difference between the intervention and control groups.</p>	Not applicable	In subgroup analysis, the meta-analysis showed that the clinical medication review had positive results for all outcomes and is favoured over other adherence reviews, which showed no significant effect on hospitalizations or mortality. Evidence may show that advanced clinical medication reviews for hypertension and dyslipidemia are most effective in improving health outcomes. More research would be required to assess value for other conditions as well as the economic impacts.
Nieuwlaet and others ¹¹²	Systematic review of published literature until January 11, 2013	Various	Interventions were generally complex with several different ways to improve medicine adherence, including enhanced support from family, peers, or allied health professionals, such as pharmacists, who often delivered education, counselling, or daily treatment support.	Studies heterogeneous—could not combine results in a statistical analysis in order to reach general conclusions.	Not applicable	Uncertain how medicine adherence can consistently be improved. There is a need for more advanced research methods that look at how to improve medical adherence, including better interventions, and better methods for measuring adherence and sufficient number of patients.

Source: The Conference Board of Canada

¹¹¹ Hatah and others, “A Systematic Review and Meta-Analysis of Pharmacist-Led Fee-for-Services Medication Review.”

¹¹² Nieuwlaet and others, “Interventions for Enhancing Medication Adherence.”

Minor Ailments Assessment and Prescribing

See Table 7 for a summary of key evidence for other non-dispensing pharmacist services including minor ailments and prescribing. Minor ailments assessment and prescribing authority were categorized together as they are often done together. Like medication review and management, minor ailments assessment and prescribing are considered more complex than traditional pharmacy services because of the health assessment component.

Pharmacist prescribing authority type (independent/dependent), year of initiation, scope of practice, and the level of government-sponsored services in Canada varies significantly by jurisdiction. Gauvin, Lavis, and McCarthy, in their evidence brief, provide a useful comparison of pharmacist-prescribing models in select jurisdictions in Canada and abroad.¹¹³ Alberta has allowed prescribing authority, with government reimbursement, the longest (since 2007). The most recent addition to the list of provinces with prescribing authority for pharmacists is Manitoba, which has allowed prescribing authority since 2014, but provides no government reimbursement for the service.

Our evidence review shows few results for pharmacy-based minor ailment interventions. One review study by Paudyal and others reported some positive results for pharmacy-based minor ailment schemes, specifically a high proportion of patients reporting complete resolution of symptoms after an index pharmacy-based minor ailment schemes consultation, ranging from 68 to 94 per cent.¹¹⁴

Pharmacist prescribing has been well documented in the pharmacy literature and has been found to be effective, particularly in the management of hypertension, dyslipidemia, and diabetes.

There is some research on antibiotic treatment of urinary tract infection (UTI) by community pharmacists out of the United Kingdom. The study by Booth and others compared the care pathway of patients with UTI symptoms attending general practitioner services with those patients managed by a pharmacist in community pharmacy in order to better understand characteristics of presenting patients and level of accessibility and appropriateness of care within these two settings, and to understand patient preferences and attitudes regarding UTI care in these settings.¹¹⁵ Some of the notable findings in this study included the majority of patients presenting in pharmacy (one-third) on weekends and times when general practice (primary care) settings were closed, patients seeking care in pharmacy presented earlier (accessed care) earlier than those presenting in general practice, and that more than half of patients indicated they would be less likely to consult their physician if antibiotics became available from community pharmacies, irrespective of whether they received a prescription from their physician or were managed in pharmacy. (See “Patient Experience With Medication Review and Assessing Minor Ailments.”)

Future research, however, requires the examination of cost implications and other contextual barriers and facilitators to scale up. In the context of managing and prevention of diseases and risks, prescribing authority would be an important component of a community-pharmacist intervention for scale-up for any one or more ailments or conditions for which there is supportive evidence. (See “On the Horizon: Developments in Pharmacy Research in Canada.”)

¹¹³ Gauvin, Lavis, and McCarthy, *Evidence Brief*.

¹¹⁴ Paudyal and others, “Are Pharmacy-Based Minor Ailment Schemes?”

¹¹⁵ Booth and others, “Antibiotic Treatment of Urinary Tract Infection.”

Table 7. Assessing Minor Ailments and Prescribing: Selective Summary of the Literature on the Health and Economic Benefits of Pharmacist and Pharmacy Services

Study reference	Study design	Regions or countries	Pharmacist or pharmacy intervention	Health benefits	Economic benefits	Challenges and opportunities
Booth and others ¹¹⁶	Antibiotic treatment of urinary tract infection by community pharmacists: a cross-sectional study.	U.K.	Urinary tract infection management, including trimethoprim under patient group direction (prescription guidelines based on specific patient criteria) via community pharmacy	<ul style="list-style-type: none"> • Not applicable 	Not applicable	This study did not assess the impact on health or economic outcomes, but rather the characteristics of patients presenting in pharmacy compared to general practice for a urinary tract infection (UTI). The important findings, however, were in relation to interest among pharmacists and patients to provide and receive care, including antibiotic prescribing and counselling. Also notable is that the majority of patients who went to the pharmacy for a UTI did so on weekends and when general practice clinics were not open, which supports the theory that UTI management in pharmacy is perceived as more convenient and can potentially reduce wait times for care. One of the challenges that was observed in both general practice and in the pharmacy setting was appropriateness of prescribing for a UTI, as a proportion of patients receiving antibiotics were unnecessarily treated with an antibiotic (i.e., UTI cases that were uncomplicated and self-limiting). Of the 41 patients who presented to the pharmacy for a UTI, 31 (76 per cent) met the prescribing guidelines for an antibiotic. Of patients presenting to a general physician, 56 per cent were in line with the National Health Service guidelines for prescribing.
Faruquee and Guirguis ¹¹⁷	Scoping review of published studies	Canada (Sask., Alta., B.C., pharmacists from N.S.), Scotland	Pharmacist prescribing	<p>As reported in several studies that evaluated the outcome or impact of a pharmacist prescribing:</p> <ul style="list-style-type: none"> • minor ailments—improvement in symptoms in 81 per cent of participants; • reduction in HBA1c—51 per cent of patients achieved target; • blood pressure— 	Incremental cost savings	<p>Qualitative studies reported some interesting results, including the following:</p> <ul style="list-style-type: none"> • Most surveyed rural pharmacists in B.C. showed interest in prescribing hormonal contraceptives (85 per cent). • The reasons for pharmacists to apply for prescribing authority include perceived relevancy and value, and increased efficiency. • Barriers to applying for prescribing authority include lengthy application process, increased liability risk, challenges with patient

¹¹⁶ Booth, J. and others, "Antibiotic treatment of urinary tract infection by community pharmacist

¹¹⁷ Faruquee and Guirguis. "A scoping review of research on the prescribing practice of Canadian pharmacists." (Faruquee 2015)

				<p>significant reduction in systolic blood pressure (mean difference of 7 mmHg) compared with the control group.</p> <ul style="list-style-type: none"> cholesterol—more than a two-fold reduction in LDL cholesterol; quality of life and survival with diabetes—improved with pharmacist initiation of insulin sooner in uncontrolled T2 diabetes; increase in emergency contraceptive use. 		<p>follow-up, and documentation.</p> <ul style="list-style-type: none"> There seems to be a collaboration challenge between pharmacists and physicians, which differs by setting (general practice vs. community pharmacy), with tension between independent and collaborative prescribing being described. There is an opportunity to explore pharmacist prescribing in the context of an interprofessional health care system. There is an opportunity to identify strategies to improve the collaborative relationship between pharmacists and physicians and other health care professionals.
Gauvin and others ¹¹⁸	Evidence brief (literature review and consultation)	Ont., Canada	Pharmacist prescribing	<p>Not assessed specifically, although some individual studies are referenced in the document.</p> <p>Some general observations offered to support recommendations/options presented in the report include:</p> <ul style="list-style-type: none"> minor ailments—high symptom-resolution rates, low re-consultation rates, decline in the total number of consultations, and prescribing for minor ailments; improved hypertension management with statistically significant reduction in blood pressure; improved blood pressure and lipid level control in patients who suffered a minor stroke; 	Not applicable	<p>This review provides detailed policy and contextual recommendations to enhance the appropriateness and ability for pharmacists to prescribe. The key recommendations or options presented in this report include the following:</p> <ul style="list-style-type: none"> facilitate the system-wide adoption of collaborative prescribing agreements in primary and community care settings; establish a pharmacist-prescribing program for minor ailments; establish an advanced practice pharmacist model. <p>Barriers included:</p> <ul style="list-style-type: none"> There is a lack of public awareness of pharmacists' roles beyond dispensing drugs, potential confusion about what is/isn't a minor ailment, or what an advanced practitioner can/can't do. Health care professionals may be reluctant to engage in a new model of care without tangible incentives. Organizations may be concerned that such reforms could erode the role of some professional groups. There are concerns from employers offering supplemental drug coverage about the impact of such reforms on drug costs. Health system challenges include leaders who might be reluctant to reconfigure scopes of practice since this is a very politically

¹¹⁸ Gauvin, Lavis, and McCarthy, *Evidence Brief: Exploring Models for Pharmacist Prescribing*. (Gauvin June 16 2015)

				<ul style="list-style-type: none"> • improved dyslipidemia control; • improved glycemic control for diabetes patients. 		<p>sensitive issue.</p> <p>Opportunities included:</p> <ul style="list-style-type: none"> • Recent entry-to-practice pharmacy degree programs in Ontario may prepare pharmacists to take on expanded scope of practice. • Some governments are committed to transforming the delivery of local health care and to encouraging collaboration among health care professionals. • There are opportunities to learn from pharmacist-prescribing models that already exist in Canada and abroad.
Mansell and others ¹¹⁹	Survey	Sask., Canada	Survey of pharmacy patrons who were prescribed a medication for a minor ailment by a pharmacist over a period of 1 year.	<p>Cold sores were the most common minor ailment (34.4 per cent), followed by insect bites (20 per cent) and seasonal allergies (19.2 per cent). Trust in pharmacists and convenience were the most common reasons for choosing a pharmacist over a physician, and 27.2 per cent would have chosen a physician or emergency department if the minor ailment service were not available. The condition significantly or completely improved in 80.8 per cent of patients, while 4 per cent experienced negative side effects. There was a high satisfaction with the pharmacist service, with only 5.6 per cent feeling a physician would have been more thorough.</p>	Not applicable	Prescribing for minor ailments was the focus of this study, but evidence mostly supports patient and pharmacist acceptance as opposed to clinical effectiveness. Cost was not assessed.
Paudyal and others ¹²⁰	Systematic review of published studies between 2001 and 2011	Various	Community pharmacy-based minor ailment schemes	Re-consultation rates in general practice, following an index consultation with a pharmacy-based minor ailment schemes, ranged	Mean cost per pharmacy-based minor ailment schemes consultation ranged	Extent to which pharmacy-based minor ailment schemes shift demand for care from high-cost settings has not been fully determined. This evidence suggests that pharmacy-based minor ailment schemes provide a suitable alternative

¹¹⁹ Mansell and others, "Evaluating pharmacist prescribing for minor ailments." (Mansell 2015)

¹²⁰ Paudyal and others, "Are pharmacy-based minor ailment schemes a substitute for other service providers?" (Paudyal 2013)

				from 2.4 to 23.4 per cent. The proportion of patients reporting complete resolution of symptoms after an index pharmacy-based minor ailment schemes consultation ranged from 68 to 94 per cent.	from £1.44 to £15.90. Total number of consultations and prescribing for minor ailments at general medical practices often declined following the introduction of pharmacy-based minor ailment schemes.	to general medical practice consultations. There is a need for full economic evaluation to inform scale-up/future delivery.
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Source: The Conference Board of Canada

Patient Experience With Medication Review and Assessing Minor Ailments

Recent analysis of a survey of 2,416 Canadian Association of Retired Persons (CARP) members¹²¹ on medication reviews showed the following observations:

- 47 per cent said medication reviews make them more comfortable with their medications.
- 39 per cent said medication reviews give them peace of mind regarding their medications.
- 22 per cent said medication reviews make it easier for them to take their medication as recommended.
- 40 per cent think pharmacists rather than doctors are the best source of information on drug interactions.
- 68 per cent said they find their pharmacist's advice on any interactions more useful than their doctor's.

A pilot study on the provision of minor ailments services in the pharmacy setting in Nova Scotia¹²² found the following results of a survey of 587 patients:

- 99 per cent of respondents said they would use the pharmacist-led minor ailments assessment and prescribing service again.
- 96 per cent of respondents said these services were beneficial or very beneficial.
- 30 per cent of respondents said they would not pay for these services if they were not (financially) covered by the government or third-party insurance.
- 70 per cent of respondents said that they would be willing to pay (out of pocket) for these services—the average willingness to pay was \$18.95 (\$3 to \$120).
- 96 per cent of respondents said these services allowed them to gain access to health care sooner.
- 57 per cent of respondents said that they would have either seen their family physician, 20 per cent would have gone to a walk-in clinic, and 9 per cent would have gone to the hospital emergency department, for these services as an alternative to pharmacy—10 per cent of respondents would have sought no help.

¹²¹ Shoppers Drug Mart and CARP, *Sustainable Solutions Report*.

¹²² Pharmacy Association of Nova Scotia, "Evaluation of the Provision of Minor Ailment Services."

On the Horizon: Developments in Pharmacy Research in Canada

As the scope of practice for pharmacists has advanced in recent years, academic and research communities across Canada are increasingly focused on understanding the implications and opportunities in community settings.

For example, the Ontario Pharmacy Research Collaboration (OPEN) is a program of research funded by the Ontario government, with support from the University of Waterloo and McMaster. Through this initiative, researchers from various settings are collaborating to provide the quality, outcomes, and value evidence on medication management services provided by Ontario pharmacists. At the January 2016 OPEN Summit, researchers presented findings or work-in-progress related to topics such as the development of an evaluation framework for pharmacy services, determining stakeholder priorities for economic analyses of billable pharmacy services, and the return-on-investment of pharmacist-administered flu vaccines.¹²³ In Alberta, through the EPICORE Centre (Epidemiology Coordinating Research Centre), a number of research projects on community pharmacists have been undertaken. For example, the Rx EACH (Alberta Vascular Risk Reduction Community Pharmacy Project) builds on the Alberta model of scope and remuneration of pharmacists to consider their impact on cardiovascular disease and risk factors.¹²⁴ In Quebec, Réseau STAT is a network of researchers focused on community pharmacy.

Meanwhile, pharmacy schools in Canadian universities are moving ahead with innovative models to leverage the changing scope of pharmacists. At the Leslie Dan Faculty of Pharmacy, University of Toronto, the new Centre for Practice Excellence will help provide community pharmacists with evidence-based management and practice tools and training as they adapt to their changing roles and opportunities. And the Medications Therapy Clinic at Memorial University provides clinical opportunities for pharmacy students and practising pharmacists, and has a research component to help assess the impact and value of the expanded scope of pharmacy practice.¹²⁵

Projects and initiatives such as these, among others, will provide help provide some of the answers that governments and the pharmacy community need for clinical practice, and to make evidence-based policies, decisions, and investments.

¹²³ Ontario Pharmacy Research Collaboration, *2016 OPEN Summit*.

¹²⁴ Epidemiology Coordination and Research Centre, *EPICORE Projects*.

¹²⁵ Memorial University, School of Pharmacy, *Medication Therapy Services Clinic*.

Key Challenges and Opportunities

Based on our literature review, the opportunities for being able to identify solutions for optimizing the expanded scope of practice of pharmacists is focused primarily on enhancing the evidence of the effectiveness of pharmacist services on health outcomes for the recipient, as well as evidence on the economic impact, including costs of investment and return on investment from the perspective of the third-party payer and society, where this information was available.

One of the main challenges with synthesizing the literature for this review was being able to effectively compare and contrast interventions across a broad spectrum of therapeutic service areas. Similar to other reviews, we found it difficult to group services by disease focus and/or by service category as the interventions in many of the reviewed studies would overlap. As an example, the study by Tsuyuki and others focused on community pharmacist intervention in the management of hypertension in patients with uncontrolled blood pressure; however, the intervention itself involved the pharmacist prescribing antihypertensive medications.¹²⁶ In this example, we included this study as evidence to support community pharmacy providing cardiovascular disease-related service. Similar examples can also be found in other studies pertaining to medication review and management, minor ailments, and prescribing by a pharmacist in the context of other therapeutic areas, such as smoking cessation, cardiovascular disease-related services, neuropsychological health, respiratory conditions, antibiotic prescribing for UTI, etc.

Understanding the value of these services or programs (multiple service offerings) and evaluating their potential for scale-up is further complicated by different types and combinations of services offered within one program (e.g., education/counselling, medication management, laboratory test orders, medication prescribing, feedback to physician, patient reminders); the duration of programs and follow-up (e.g., 6 months, 12 months, 18 months, 2 years); the outcomes of interest (e.g. reaching health status targets, medication adherence, economic impact); the target population (diabetic, hypertensive, dyslipdemic, low income, seniors, the settings (community pharmacy, outpatient pharmacy, general medical practice); and other important contextual, enabling factors (e.g., remuneration schemes for pharmacists, prescribing authority, injecting authority, logistical constraints in a community pharmacy, an independent versus collaborative care model, patient values). Nevertheless, it is important to appreciate all of these issues when making decisions regarding the design, implementation, and evaluation of a model of pharmacy practice. Having done this evidence synthesis and combining this knowledge with insights from key pharmacy practice stakeholders provides us with the opportunity to prioritize services for the economic modelling phase of the Conference Board's larger program of research, and has helped us identify important information that will help in the development of the models.

Systematic reviews, meta-analysis, and high-quality study designs, including randomized-controlled trials where there is an adequate comparator or control group, are considered to be the foundation of good evidence. Results from Canadian-based trials or evaluations in practice settings are particularly valuable. Due to the paucity of evidence in this review it was a challenge to identify pharmacy services that had strong evidence for scale-up. In some cases, services have already been scaled up despite lack of strong and conclusive evidence, such as with influenza vaccination.

The evidence reviewed in this study was of low, moderate, or high quality, with much of the body of literature considered low quality in terms of the number of studies that were able to

¹²⁶ Tsuyuki and others, "Randomized Trial."

associate or at least suggest an association between specific pharmacist interventions and direct health and economic outcomes. Based on the literature review, we believe the best evidence to support community pharmacist intervention was for smoking cessation, and the management of hypertension and dyslipidemia for the prevention of cardiovascular-related conditions and events. Further, there was good evidence to support a more collaborative care model for pharmacy practice, although more evidence is required to determine how this type of model can best be delivered in the community.

In terms of intervention components, there was strong evidence to support pharmacists' prescribing authority for specific conditions. Prescribing authority of community pharmacists could be considered the most important in terms of health and economic outcomes within the expanded scope of community pharmacists. Other reviews published more recently have looked specifically at the evidence for pharmacist prescribing.^{127, 128, 129} The evidence to date has been mixed, mostly due to great heterogeneity across studies; however, for many of the therapeutic services examined in this study, prescribing authority was identified as a critical component in the success of the interventions.

Although the evidence (health and economic) for influenza vaccination in community pharmacy is sparse, we also believe that with its current wide-scale application across most provinces in Canada today and the impressive trends in uptake in certain provinces already observed, there is an opportunity to evaluate the health and economic impact from a Canadian and societal perspective. The opportunity with influenza vaccination is in leveraging the currently collected data on administration, uptake, costs, and health outcomes at the population level to determine its health and economic impact from a macroeconomic perspective. To date, only one Canadian modelling study for influenza vaccination in community pharmacy has been conducted; however, this study focuses only on Ontario and does not include indirect costs such as labour force productivity.

With this being said, pharmacy services and programs that have available low- to moderate-quality evidence still have the potential to be modeled so long as enough data is available to establish, with some degree of certainty, the impact of scaling-up from the payer perspective in terms of reaching public health mandates (e.g. vaccinations), improving population health outcomes (e.g. cardiovascular health), and reducing costs by shifting care from more expensive settings to pharmacy (e.g. antibiotic prescribing and counseling for UTI). The options for modeling will be further discussed in the subsequent chapter of this report.

Although the focus of this review was to evaluate the published literature on the health and economic benefits of expanded pharmacy practice, it should be noted that any unintended consequences or harms are also important considerations. Future work in modelling the health and economic impacts of expanding or scaling up pharmacy services or programs, must also consider the trade-off between the potential positive and negative consequences. (See "Anticipating the Road Blocks: Other Health Care Providers and Public Payers.")

¹²⁷ Gauvin, Lavis, and McCarthy, *Evidence Brief*.

¹²⁸ Nkansah and others, "Effect of Outpatient Pharmacists' Non-Dispensing Roles."

¹²⁹ Faruquee and Guirguis, "A Scoping Review of Research."

Anticipating the Road Blocks: Other Health Care Providers and Public Payers

In addition to the challenges related to lack of data and evidence on effectiveness and cost-effectiveness, there are some other critical barriers to expanded pharmacy practice. Two large issues that have come out of both the interviews and the literature include other health care providers' perception and concerns regarding pharmacists' expanded scope, and public payers' (government) concerns regarding costs and system efficiency. Moving forward, these challenges would need to be addressed to ensure that effectiveness, uptake, and efficiency are optimized from the point of view of the whole health and health care system.

Although other health care professionals may feel hesitation or concern with expanded pharmacists' scope in the context of their own practice and the potential scope overlap, research to date has been scarce regarding their perceptions of enhanced services delivered in Canadian community pharmacy. One Canadian study compared other health care providers' satisfaction with restructured pharmacy services in primary care, whereby the pharmacist's clinical role was more proactive and less reactive.¹³⁰ Although this study was conducted in a primary care team setting, there may be insights that can be leveraged for community pharmacy. In the study, proactive clinical pharmacy services included, but were not exclusive to, performing admission histories, individualized medication therapy, identifying and resolving all drug-related problems, providing drug-related monitoring and follow-up, and counselling patients. Reacting (usual care) clinical pharmacy services included resolving drug-related problems identified by staff in the dispensary, providing therapeutic drug monitoring for selected medications, adjusting doses for selected patients with renal dysfunction, and answering drug information questions and counselling patients upon request. The results showed that nurses and physicians from units where a pharmacist had been assigned to provide proactive services perceived pharmacist services more favourably than those from units where pharmacist services were reactive. Pharmacists also either agreed or strongly agreed that the restructuring improved job satisfaction as well as patient safety.

A review study by Tannenbaum and Tsuyuki discussed several ethical, legal, and professional issues pertaining to expanded pharmacy scope of practice.¹³¹ They note that overlapping scopes of practice with pharmacists may either reduce or increase the potential for patient harm due to prescribing changes or miscommunication regarding medication-monitoring and management. Further, like the medical profession, pharmacists must practise under a framework developed by their regulatory bodies in each province and territory and must hold liability insurance. In terms of financial issues, as mentioned earlier, payment models or schemes directly affect utilization, effectiveness, as well as overall costs. When it comes to collaborative care models, financial incentives that support collaboration and communication between physicians and pharmacists would mitigate the risks of harm. The study's authors note that physician fee schedules for participation in telephone consultations initiated by pharmacists for advice about patient care or for medication supervision and renewals are already in effect in many provinces and territories.

¹³⁰ Mysak, Rodrigue, and Xu, "Care Providers' Satisfaction With Restructured Clinical Pharmacy Services."

¹³¹ Tannenbaum and Tsuyuki, "The Expanding Scope of Pharmacists' Practice."

Chapter 5: Identifying Priorities for Measuring Economic Impact

Chapter Summary

- The convergence of high-interest or priority areas identified by government stakeholders and the health and economic evidence highlights areas of greatest potential for pharmacy practice model scale-up.
 - Return on investment is influenced by a variety of factors, including administration costs, related economic spin-offs, and downstream economic benefits related to improved population health and health care system savings— all of which decision-makers must consider when allocating health care funding.
 - Any service selected for modelling must demonstrate its scalability and cost-effectiveness by successfully meeting the criteria of effectiveness, cost, and acceptance.
 - Stakeholder priorities and evidence matrices help inform the most appropriate services to model.
-

Convergence of Evidence and Stakeholder Priorities for Measuring Economic Impact

Bringing together the priority areas identified by the pharmacy practice stakeholders with the health and economic evidence on community pharmacy practice provides us with the confidence in identifying practice models and approaches that could be scaled up across the country.

Since priorities across stakeholder groups often varied and sometimes contradicted each other, we decided to find convergence in the priorities or areas of high interest identified by the drug plan managers (government) with the evidence, as we felt this stakeholder group would be the greatest barrier/facilitator to scaling up any particular practice model from a funding challenge perspective. We tried to identify areas of overlap in stakeholder interest and evidence of effectiveness and cost-effectiveness. In general, very little evidence was available on the cost-effectiveness of community pharmacy or pharmacy in general. However, it is reasonable to associate better health outcomes with health care system savings and economic gains via improved productivity. (See “Summary of Stakeholder Priorities.”)

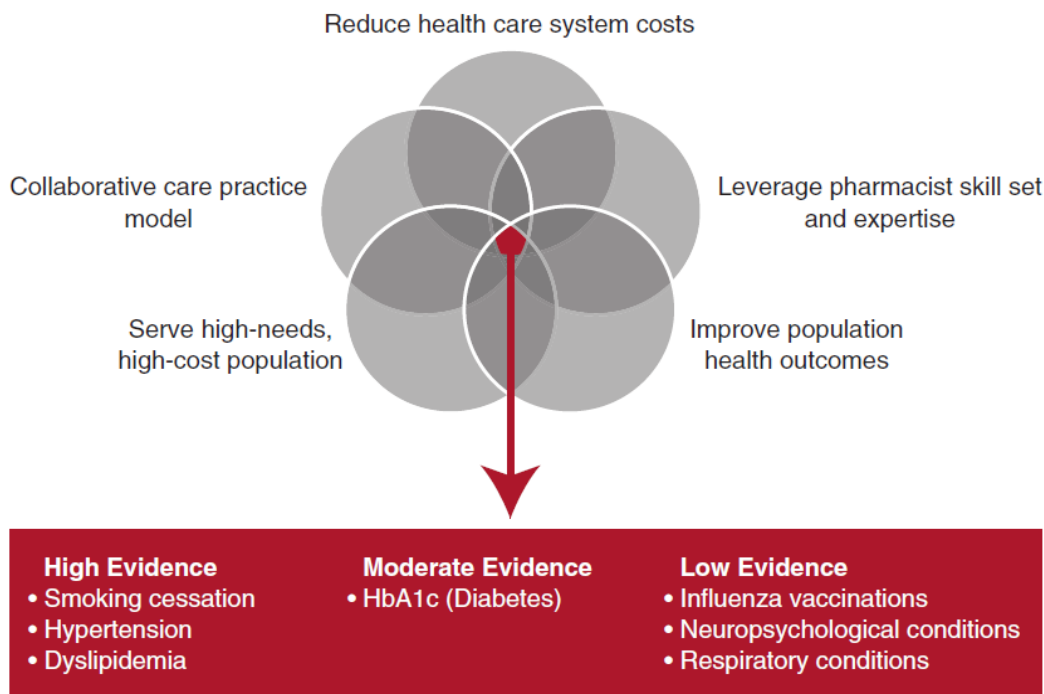
Summary of Stakeholder Priorities

- Reduce health care system costs.
- Leverage pharmacists' skill set and expertise.
- Improve population health outcomes.
- Serve the high-needs/high-cost population.
- Provide a collaborative care model of practice.

Numerous opportunities exist to garner the benefits possible from optimizing the scope of practice of pharmacists and the role of community pharmacies. The challenge is to translate the opportunities suggested by the research into practices and programs that deliver results in real-world settings. This dilemma is clear when contrasting the research base supporting the value of medication reviews against the perspectives we heard that medication reviews in various jurisdictions have not delivered the desired results. Part of this may be program design (not reaching the right population), and part quality issues (service inconsistencies). As a way to better identify services that would most likely meet these criteria, the stakeholder priorities and evidence matrices may be considered a guide for selecting the most appropriate services for modelling. (See exhibits 1 and 2.)

Exhibit 1

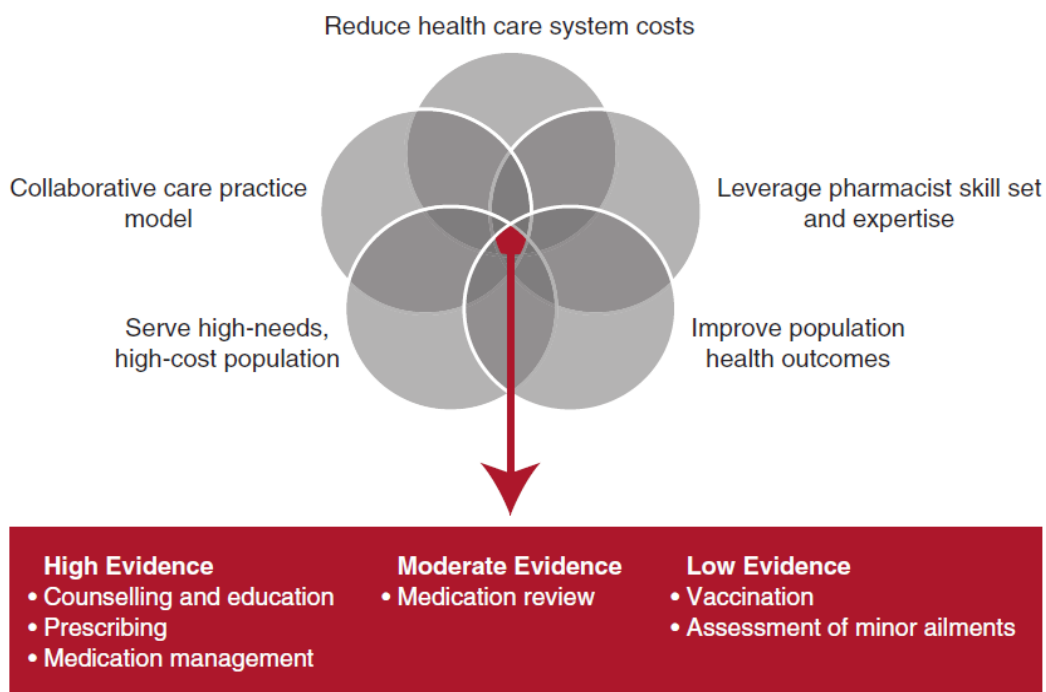
Stakeholder Interest and Evidence Matrix for Therapeutic Programs



Source: The Conference Board of Canada.

Exhibit 2

Stakeholder Interest and Evidence Matrix for Services



Source: The Conference Board of Canada.

Criteria for Measuring Economic Impact of Pharmacy Services

Based on both the evidence of effectiveness and potential or real-cost impact, along with insights we gleaned around sustainability, there are several options to explore as part of the economic modelling in this research series. Any option chosen for modelling must meet certain criteria to ensure its viability as a scalable and cost-effective intervention.

It is important to note that any modelling exercise on the hypothetical scenario, in this case the predicted health and economic impact over time of scaling up services, requires setting certain modelling and contextual assumptions. Modelling assumptions relate to the relationships between inputs (independent variables or factors) and outputs (dependent variables or outcomes).

Based on the stakeholder priorities and the evidence, as well as an understanding of the current landscape of pharmacy services in Canada to date, there are several options that could be modelled in the subsequent phase of this research. Exhibits 1 and 2 provided an overview of pharmacy services and programs that were identified as being potentially of high stakeholder interest while discerning which services and programs have low, moderate, and high evidence of effectiveness. Although a service or program with high evidence would be relatively easier to model (more reliable data available), there may be less opportunity or appetite to model them

from the stakeholder perspective. On the other hand, there may be services and programs for which evidence of effectiveness and cost-effectiveness is low to moderate, but there is strong appetite to model their potential health and economic impact of scale and spread. Although low-to-moderate evidence can be used in modelling, more assumptions and uncertainty may apply to the results of the analysis.

As discussed in the previous chapter, although services/programs for which the highest evidence is available is less challenging to apply to economic modelling, they might not necessarily be the areas in which there is greatest opportunity for population health impact, health system efficiency, patient preference and experience, and policy change. On the other hand, although it may be more difficult to model a service/program for which low-to-moderate evidence is available on health impact, these may be areas for greater or greatest opportunity.

In addition to the criteria for pharmacy services modelling established in this report, other important considerations should be taken into account when identifying candidates for economic modelling which relate to the following questions:

- Are there pharmacy services and programs that are not uniformly applied in all jurisdictions that have the greatest potential to make an incremental population health impact while alleviating the economic burden of administration on a per capita basis?
- Are there pharmacy services and programs for which there is greatest potential for success in expanding scope of practice and achieving widespread implementation, as measured by high/increased pharmacy and population uptake and government support?
- Are there pharmacy services and programs that are not currently implemented but which have the strong potential to be offered based on feasibility and stakeholder desirability?
- Can low-to-moderate level of evidence be leveraged to provide new knowledge regarding the scale-up of innovative pharmacy models through an economic modelling exercise?

These questions relate to several selection criteria that could inform the choice of pharmacy services and programs for economic modelling in the subsequent report of this research series, among several options for which there are varying levels of existing evidence of health and economic impact, as described in exhibits 1 and 2.

The criteria described below were selected as they were perceived by the researchers and the advisory committee as being high-priority factors that would contribute to the likelihood for a policy change.

Availability and Strength of Evidence

Under these selection criteria, a service or program would be predicted to have good economic modelling potential if there is at least some data that would show one or both of two things: 1) the improvement of population health outcomes in the existence of the service or program in pharmacy compared with if these services were not available in pharmacy; and/or 2) increased population utilization/uptake of a service or program for which there is a public health target or government mandate to increase population participation.

For example, nationally and across provinces and territories, there is a public health target for influenza vaccinations. We now have data over several years that show trends in influenza vaccination over time since jurisdictions allowed pharmacists to deliver these vaccinations in the community. Modelling the impact of influenza vaccination in pharmacy therefore can be achieved by estimating the economic impact of increased influenza

immunity in the population (reduced cases resulting in less health system use due to the disease) as well as lower costs of administration compared with primary care. Although the pneumococcal or herpes zoster vaccination are not consistently within the scope of pharmacists across Canada, the same modelling approach could be applied for Canada using data that exist in the U.S. in changes in vaccination rates in the U.S. with expanded pharmacist scope of practice.

Incremental Population Health Impact

Economic modelling can be conducted only for a service shown to be more than or as effective as the status quo or alternative provider/service model. Specifically, evidence showing service by a pharmacist is more effective, such as in improving health outcomes, quality of care, and reducing health care system utilization compared with other service providers.

Under the selection criteria of incremental population impact, a service or program would be predicted to have a high population health impact if its scale-up could result in large improvements in health at the population level (a significant proportion of the population), can increase timely access to treatment that would result in improved health outcomes at the population level, and/or would result in improvements in health for a high-needs population (a smaller proportion of the population but which are at higher risk for serious health problems, premature death, or are considered high-cost patients or high users of the health care system).

For example, there is high evidence to show the population health impact of reducing and managing hypertension in the population via avoidance of cardiovascular complications including heart attack and stroke. There is also high evidence to show the effectiveness in pharmacist intervention through the management and prescribing authority to address hypertension compared with usual care. Given the population health risk of hypertension and cardiovascular disease in the Canadian population, this program of services in pharmacy has the high potential for population health impact and, as a result, would also have an important impact on system efficiency via the avoidance of complications due to unmanaged hypertension. Influenza vaccination, on the other hand, may not demonstrate a high incremental population health impact as this service is already being provided in the vast majority of provinces and territories, therefore limiting the population impact with further expansion over time.

System Efficiency

Ideally, a service would be modelled when it has been determined that it is more effective than the status quo or alternative intervention (e.g., pharmacist services vs. physician services vs. public health). In the case where the service is shown to be as effective as or less effective than the status quo or alternative provider/service model, the services provided by a pharmacist or in a community pharmacy setting are, at the least, as expensive (same cost) or at best less expensive (less cost).

Under this selection criteria, a service or program would be predicted to have a high impact on health system efficiency if it can result in reduced costs to the health care system, such as through the avoidance of unnecessary and costly health care (e.g., emergency room visits, hospitalizations, primary care visits, and medications to deal with adverse events and complications). These cost savings or efficiencies can either be gained indirectly through

improved population health and timely access to appropriate and necessary care resulting in "keeping people out of the health care system for longer," as well as directly through less costly administration of already delivered health care services.

For example, the assessment of minor ailments such as urinary tract infections and the ability to prescribe antibiotics for this condition when indicated is currently within the scope of pharmacists' practice in New Brunswick. The efficiency gains attributable to shifting patient visits from primary care, walk-in clinics, and emergency departments to community pharmacy would be directly related to lower costs of administration where most provinces pay pharmacists a much lower fee to assess minor ailments than physicians.

Feasibility and Acceptance

Under this selection criteria, a service or program would be predicted to have limited challenges to implementation in terms of the availability of existing infrastructure, pharmacists' existing knowledge and skills, time and effort required to acquire new knowledge or skills, and financial incentives. The ability to roll out or scale up a new or existing program can be done more quickly, efficiently, and effectively when the barriers to implementation and uptake are limited.

Feasibility is also directly related to whether the service is accepted by key stakeholders (pharmacists, P/T governments, private insurers, other health care providers, and patients) to be performed by pharmacists in community settings on a wider scale. There is a perceived value of expanding or scaling up this service. There is readiness (i.e., a positive environment for the scale-up of this service because of confidence in its potential and real effectiveness, cost-savings or cost-neutrality, and other important factors including stakeholder priorities and political will).

For example, pharmacists in all Canadian provinces and territories (except Quebec) can administer vaccinations for influenza. There is therefore existing infrastructure as well as knowledge and skill to administer other injectables, such as other vaccinations including for the prevention of pneumonia and shingles in the older adult population. Further, the increase in uptake of annual influenza vaccination in pharmacies and at the population level across provinces and territories over a relatively short time period demonstrates high acceptance by pharmacists, patients, and governments to deliver influenza vaccinations, and potentially other types of vaccinations, in community pharmacy.

Patient Experience

Under this selection criteria, modelling priority should be given to pharmacy services and programs for which there is evidence of high satisfaction among the patient population. Much of this evidence will come from surveys that have already been collected and are in the progress of being collected in Canada. Other data may come from other countries that have experienced expanded pharmacy practice for longer_or which have generated more research findings that could be applied to the Canadian context. Further, pharmacists and pharmacist associations may be able to provide expert opinion on what their clients want based on qualitative or anecdotal information. As demonstrated earlier in this report, there have been reported high satisfaction with influenza vaccination, medication review, and assessment of minor ailments in Canadian pharmacies. (See Chapter 4.)

Selecting Services for Economic Modelling

As part of the work for the subsequent report in this research series, three economic models assessing the health and economic impact of expanded practice and/or scale-up of existing services will be developed. To identify the services or programs for modelling, we propose the following approach that integrates evidence with stakeholder opinions and preferences:

1. Establish options (pharmacy services/programs) for economic modelling.
2. Weight each selection criteria according importance in decision-making (stakeholder perspective).
3. Rate each option according to each selection criteria.
4. Determine the total weighted rating for each option for modelling.
5. Identify the top three options for modelling based on the rank-ordered total weighted rating.
6. Validate the selected options for modelling with advisory committee and stakeholders.

Table 8 provides a template for implementing the steps outlined above. The Conference Board researchers will establish the ratings on evidence, incremental population health impact, and system efficiency. Stakeholders will be engaged to establish the weighting for each of the selection criteria and to provide ratings for each option for modelling for the feasibility/acceptance and patient experience.

Table 8. Prioritization of Pharmacy Services for Modelling Template

Service or program	Selection criteria Rating scale: 1 = lowest; 10 = highest					Final score
	Evidence	Incremental impact on population health	System efficiency	Feasibility/ acceptance	Patient experience/ preferences	
	Weight =a	Weight =b	Weight =c	Weight =d	Weight =e	
Influenza vaccination	v	w	x	y	z	$= (a*v)+(b*w) + (c*x)+(d*y) + (e*z)$
Pneumococcal vaccination						
Shingles vaccination						
Neuropsychological conditions						
Respiratory conditions						
Minor ailments—assessment and prescribing (e.g., urinary tract infection)						
Diabetes management						
Medication management						
Smoking cessation						
Hypertension management						
Dyslipidemia management						
Counselling and education						

Chapter 6: Final Thoughts

Chapter Summary

- This report provides an overview of pharmacy practice in Canada, available evidence on the impact of various pharmacy services, and the key challenges and opportunities to further expanding scope.
 - Appropriate reimbursement and payment mechanism models are a key driver of change.
 - The convergence of government priorities and evidence highlights a number of economic modelling opportunities for the next report in this research series.
-

Summary of Findings

In this report, we described how community pharmacy has changed over time in Canada. Through pharmacy practice stakeholder interviews and a review of the evidence, we described the differences in pharmacy practice models in Canada and how they relate to the policies that govern pharmacists' practice authority, roles, and remuneration. Further, we identified key challenges and opportunities as they pertain to research, practice, and policy, as well as priority areas for modelling to demonstrate the potential value, from a health and economic perspective, of scaling up community pharmacy services.

Based on interviews with pharmacy practice stakeholders, including P/T governments, pharmacist professional associations, regulatory colleges, the private insurance industry, and academia, we identified several key challenges and opportunities that were common between the stakeholder insights and the evidence. We summarize some of the main challenges, which are also opportunities, here.

In terms of the operating environment (where pharmacists practise in the community), the pharmacist who practises in rural and remote areas and in smaller independent stores may face different challenges than their counterparts who practise in chain stores where there is often greater support and capacity for pharmacists to practise to expanded scope. Further, the for-profit pressures in a pharmacy corporate environment were identified as a concern, where volume and meeting quotas may pose a challenge for pharmacists to deliver high-quality care and practise to full expanded scope. Another challenge included the need for better integration and collaboration across the health care system, which is not a unique issue with pharmacy, but which will require solutions to facilitate more effective collaboration between community pharmacists and other health care providers, and vice versa.

Availability of good-quality evidence on the effectiveness and cost-effectiveness of community pharmacy interventions and programs remains a continual challenge. Although more data have emerged over the past couple of years, issues still remain with some of the research (e.g., the employment of before-and-after study designs as opposed to randomized controlled trials). Further, the need to connect interventions to health outcomes and for additional information on costs in Canada remains a large concern. Finally, one of the most important challenges from both the perspective of the community pharmacist and governments is appropriate reimbursement models. Compensation for health services rendered in community pharmacy is a key driver in practice, and like any sector, compensation models can incentivize different behaviours (we will expand on this more in the final report of the series). Although payers may be willing to pay for a service in community pharmacy (public pay, private pay), appropriate

payment mechanisms and amount need to be evaluated, with consideration of how other providers may be paid for providing the same service. The process by which payment schemes, if any, are decided can be considered a black box.

Whether there would be a return on investment with the wide-scale implementation of any one or more community pharmacy practice model is still unclear without more data. Return on investment is dependent upon the cost of administration and any related economic spin-off (e.g., perverse financial incentives, double-billing in the system, increases in out-of-pocket costs, increases in insurance costs) as well as the downstream economic benefits related to improved population health and related health care system savings and productivity gains in the economy. It is much easier to discern the “return” side of the equation, which is how stakeholder high interest (system cost-savings) is converged with the evidence. Decision-makers must consider the “investment” side of the equation and its impact on governments’ desire for balanced budgets.

Finally, the impact of expanded scope is likely to be realized over the longer term when new professional roles have become a consistent part of the skill mix and are fully operational. Changes to models of practice can take several years to gain solid footing as time is required for providers to attain confidence and competence in their new or changing role, and to gain acceptance by patients.

Next Steps

The subsequent report in this series will focus on modelling the health and economic impact of scaling up or expanding several pharmacy services/programs for which there is greatest potential for impact from a health, economic, and uptake perspective. In addition to leveraging the stakeholder priorities and evidence described in this report, we aim to identify services based on the selection criteria and process identified in Chapter 5 of this report for the subsequent modelling study.

The third and final report in this series will explore policy options and recommendations for action in regards to optimizing scope of pharmacy practice within the context of the broader Canadian health care system.

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Appendix A: Interview Guide and Questions

The Conference Board of Canada is Canada's leading independent, not-for-profit applied research institute. The Conference Board provides governments, business, and other organizations with highly relevant, balanced, and independent analyses of key emerging policy and management issues and opportunities to network and dialogue with each other. The Conference Board researches innovative practices, designs new strategies, and provides leaders with the most up-to-date information, analysis, and expertise to help them excel in Canada and around the world.

About This Research Project

The Canadian Pharmacists Association (CPhA) has asked The Conference Board of Canada to assess the value of existing expanded scope of practice pharmacist services and the health and economic impact of scaling-up those services. This research will focus on selected pharmacist and pharmacy-provided services (including the assessment of minor ailments, administration of vaccines, management of chronic conditions, medication management) and will provide recommendations for action for multiple stakeholders, including pharmacists and pharmacy owners, pharmacist associations, regulators, colleges of pharmacy, and government.

About the Interview

This interview will help inform the first report in the research series about the current status of pharmacy services in Canada and the identification of best practices in pharmacy. The briefing will:

- describe the evolution of pharmacy and pharmacy services
- summarize consultations with pharmacy stakeholders, including provincial and national pharmacy associations (PPAs), provincial/territorial (P/T) regulators, provincial program directors and governments, P/T colleges of pharmacists, and schools of pharmacy
- review current evidence on the health and economic impact of expanded health care and wellness services within a community pharmacy setting
- compare different P/T scope of practice models in terms of regulatory and funding frameworks to determine the barriers and facilitators to optimizing full scope of pharmacy practice and effectiveness
- identify good practice models and discuss how they could be scaled up to other provinces and territories

This interview is made up of eight questions and will take up to 1 to 1.5 hours to complete. It will contain opinion questions and questions concerning specific information we will ask you to provide. Interviewees are free to choose the perspective from which they address the questions (e.g., from a personal, institutional, partner, corporate, or other stakeholder perspective). Before beginning, the interviewer will explain the purpose of the research and any relevant concepts.

Confidentiality is important to the Conference Board; only aggregate results will be included in the final report. If any quotes are used, they will be done so only with the interviewee's permission. This interview will be recorded with the interviewee's permission. Finally, we request your permission to list your name and organization in an appendix of the final report, along with the other interviewees.

Interview Questions

The interviewer will provide a brief description regarding what the Conference Board understands about the typical community pharmacy model/services in your jurisdiction.

1. Is there anything further you would like to add to this description?
2. How have recent scope-of-practice changes impacted the community pharmacy model in your jurisdiction?
 - Please describe the challenges and opportunities arising from these changes.
 - Are there any insights you could share with other jurisdictions from your experience?
 - In retrospect, is there anything you would have done differently with the programs your jurisdiction has implemented to date?
3. What are the strengths and weaknesses in terms of accessibility to pharmacists in the communities they serve?
4. Do you have any research or evaluation evidence (now, under way, or planned) on the health and/or economic impact of your community pharmacy services that would add value to this project?
5. What type of information would be of most value to decision-makers within your jurisdiction regarding research or evaluation evidence on the health and economic impact of expanded health services within a community pharmacy?
6. What are the implementation priorities for pharmacist scope of practice and community pharmacies in your jurisdiction? Responses can be very broad and could include conditions (e.g., chronic disease management/screening), practices (medication management, adherence/prevention of re-hospitalization, minor ailments, immunizations, wellness programs), training and tools (to improve delivery), patient segments (e.g., seniors).
7. In your jurisdiction, where could you see pharmacists having the biggest impact on improving health outcomes and system sustainability (e.g., efficiencies in health care delivery/care, health promotion/prevention, health care/drug plan cost efficiencies)?
8. Are there any community pharmacy models in your province or Canada that you consider innovative or particularly effective at providing value? How could this model be scaled up in your jurisdiction?

Appendix B: Pharmacists' Expanded Scope of Practice

Pharmacists' Scope of Practice in Canada

Scope of Practice ¹		Province/Territory													
		BC	AB	SK	MB	ON	QC	NB	NS	PEI	NL	NWT	YT	NU	
Prescriptive Authority (Schedule 1 Drugs) ¹	Independently, for any Schedule 1 drug	X	✓ ⁵	X	X	X	X	X	X	X	X	X	X	X	
	In a collaborative practice setting/agreement	X	✓ ⁵	✓ ⁵	✓ ⁵	X	X	✓	✓	X	X	X	X	X	
	Initiate ²	For minor ailments/conditions	X	✓	✓	✓ ⁵	X	✓	✓	✓	✓ ⁵	✓	X	X	X
		For smoking/tobacco cessation	X	✓	P	✓ ⁵	✓	✓	✓	✓	✓ ⁵	✓	X	X	X
	In an emergency	X	✓	✓	✓	X	X	✓	✓	✓	✓	X	X	X	X
Adapt ³ / Manage	Independently, for any Schedule 1 drug ⁴	X	✓ ⁵	X	X	X	X	X	X	X	X	X	X	X	
	Independently, in a collaborative practice ⁴	X	✓ ⁵	✓ ⁵	✓ ⁵	X	X	✓	✓	X	X	X	X	X	
	Make therapeutic substitution	✓	✓	✓	X	X	X	✓	✓	✓	✓	X	X	X	
	Change drug dosage, formulation, regimen, etc.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	
	Renew/extend prescription for continuity of care	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	
Injection Authority (SC or IM) ^{1,5}	Any drug or vaccine	X	✓	✓	✓	X ⁷	X ⁷	✓	X	✓	✓	X	X	X	
	Vaccines ⁶	✓	✓	✓	✓	X	X	✓	✓	✓	✓	X	X	X	
	Travel vaccines ⁶	✓	✓	✓	✓	P	X	✓	✓	✓	✓	X	X	X	
	Influenza vaccine	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	X	X	X	
Labs	Order and interpret lab tests	X	✓	P ⁸	✓ ⁹	X	✓	P	✓	P	X	X	X	X	
Techs	Regulated pharmacy technicians	✓	✓	✓	✓ ¹⁰	✓	X	✓	✓	✓	✓	X	X	X	

1. Scope of activities, regulations, training requirements and/or limitations differ between jurisdictions. Please refer to the pharmacy regulatory authorities for details.

2. Initiate new prescription drug therapy, not including drugs covered under the *Controlled Drugs and Substances Act*.

3. Alter another prescriber's original/existing/current prescription for drug therapy.

4. Pharmacists independently manage Schedule 1 drug therapy under their own authority, unrestricted by existing/initial prescription(s), drug type, condition, etc.

5. Applies only to pharmacists with additional training, certification and/or authorisation through their regulatory authority.

6. Authority to inject may not be inclusive of all vaccines in this category. Please refer to the jurisdictional regulations.

7. For education/demonstration purposes only.

8. Ordering by community pharmacists pending health system regulations for pharmacist requisitions to labs.

9. Authority is limited to ordering lab tests.

10. Pharmacy technician registration available through the regulatory authority (no official licensing).

✓	Implemented in jurisdiction
P	Pending legislation, regulation or policy for implementation
X	Not implemented

Source: Canadian Pharmacists Association.

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