

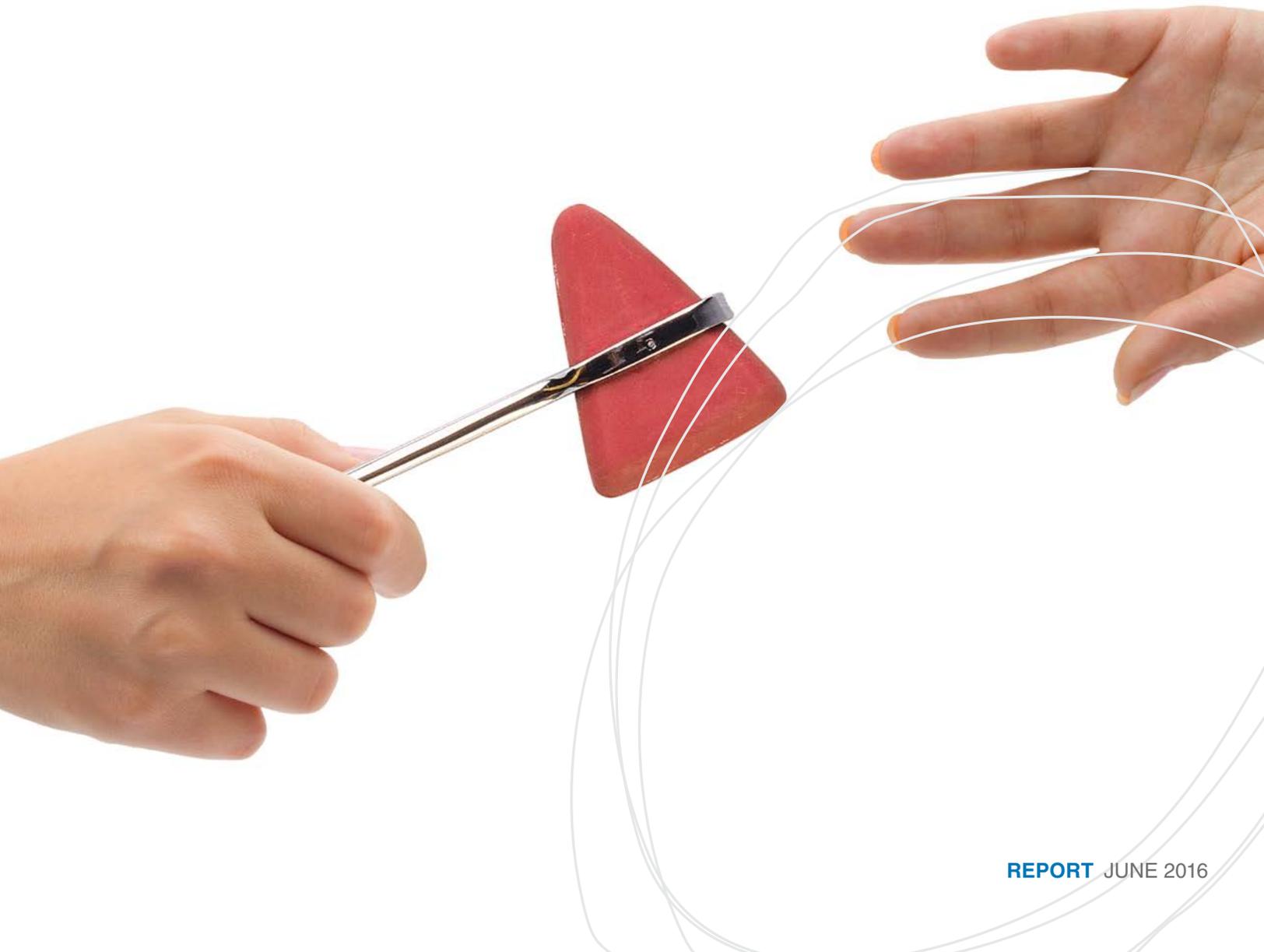


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Value of Physician Assistants.

Understanding the Role of Physician Assistants Within Health Systems



Value of Physician Assistants: Understanding the Role of Physician Assistants Within Health Systems

Kelly Grimes and Gabriela Prada

Preface

Delivering high-quality, effective, and sustainable services is both a top priority and one of the most pressing challenges facing governments and businesses as they look to balance health care service demands and costs in the context of an aging population. Physician assistants (PAs) are academically prepared and highly skilled health care professionals who provide a broad range of medical services in different clinical settings. Under the supervision of a physician, PAs complement existing health care services and aid in improving patient access to health care. The PA professional is perceived as a relatively new occupation in Canada. One of the current challenges of the profession in Canada is the lack of data on the impact of PAs from a productivity and cost-effectiveness perspective.

The first in a series, this report aims to set the stage and act as a backgrounder to better understand the role of PAs within health systems. It comprises a literature review and brief Canadian-based case studies of PA models of care. It was made possible through the generous contribution of the Canadian Association of Physician Assistants, the Royal College of Physicians and Surgeons of Canada, the College of Family Physicians of Canada, and Alberta Health Services. The intention is to provide a better understanding of the role and impact that PAs have had in various health care settings across Canada.

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EXECUTIVE SUMMARY

Value of Physician Assistants: Understanding the Role of Physician Assistants Within Health Systems

At a Glance

- Physician assistants (PAs) are a relatively new type of health care provider in Canada, although they have a long history in the military. With the exception of Manitoba and New Brunswick, PAs are unregulated across the country.
- PAs are employed across a wide variety of settings but predominately in primary health care and emergency medicine. They act as physician extenders whose scope of practice is highly dependent on the individual PA-to-physician relationship.
- Much of the impact evidence from a cost-effectiveness/efficiency perspective exists outside of Canada and comes mainly from the United States, where PAs are more prevalent. In the Canadian context, primary care, emergency care services, and surgical care services are the most promising areas for further economic modelling.

Increased demand for health services, combined with a downturn in the economy, is challenging governments to be more innovative in their approach to delivering health care. A 2013 Conference Board report showed that interprofessional health care teams can be more effective than solo providers in the management of various conditions, including diabetes and mental health. In fact, these teams can provide savings to the system and improve gross domestic product because of better population health outcomes linked to reduced health care system usage and greater worker productivity.¹

The objective of this project on the value of physician assistants (PAs) is to better understand their role and impact in various health care settings across Canada, as well as to review funding and payment models that have enabled the successful and sustainable integration of PAs into health systems. The intention is to estimate the value of physician assistants as a function of physician-time saved for selected health conditions or specialties and the cost savings attributable to the health care system.

This report aims to set the stage and act as a backgrounder to better understand the role of physician assistants within health systems. The first in a series, this report comprises a literature review and brief Canadian-based case studies of physician assistant models of care. It presents impact evidence to better understand the integration of PAs across the continuum of care in various health systems, including international data over the last 10 years from the United States, the United Kingdom, and the Netherlands.

1 Dinh and Bounajm, *Improving Primary Health Care Through Collaboration: Briefing 3*.

The individual relationship between the PA and the supervising physician becomes the essential determinant of each PA's clinical role.

Physician assistants are a relatively new health provider group in Canada despite their long history with the Canadian military. PAs are largely unregulated in Canada, with the exception of Manitoba and New Brunswick; in other provinces, PAs practise under the supervision of a physician. The Canadian Association of Physician Assistants' (CAPA) 2015 scope of practice and competency statements act as a resource for PAs in their role as physician extender. The work of a PA can include conducting patient interviews, histories, and physical examinations; performing selected diagnostic and therapeutic interventions; providing medical orders and prescriptions; and counselling on preventive health care. The individual relationship between the PA and the supervising physician becomes the essential determinant of each PA's clinical role (along with experience and education). Medical directives clarify the clinical tasks that different providers, including PAs, may undertake on behalf of a physician for specific patient populations in each practice and setting.

In 2013, the Canadian Institute for Health Information (CIHI) reported that there were 306 PAs in Canada employed across the provinces, with the majority in Ontario and Manitoba, where university PA education programs are located. However, CAPA reports higher numbers through its member survey. Civilian PAs in Canada work in a wide range of settings but predominately in community hospital and medical specialties, particularly family medicine and emergency care. Non-military remuneration ranges from \$75,000 to \$130,000, reflecting an individual PA's education, experience, scope of practice, and hours worked.

In addition to the Canadian Armed Forces Medical School, there are three other PA education programs in Canada: University of Manitoba (established in 2008); McMaster University (2008); and the Consortium of PA Education (University of Toronto, Northern Ontario School of Medicine, and The Michener Institute of Education at UHN [2008]). Together, these schools produce an average of 160 students annually.

The integration of PAs into models of care varies considerably across the country.

Programs operate in the medical model, are typically two years in length, and combine course and clinical work. All offer a bachelor's degree with the exception of Manitoba, where a master's is conferred.

Funding for PA positions comes from a number of sources: provincial governments, often initialized through demonstration projects; block funding such as academic specialty groups; and direct funding from physicians. While physicians are supportive of PAs, remuneration mechanisms—especially fee-for-service models—can be a barrier to introducing PAs. Physicians employed in capitation/blended-capitation models have more flexibility to be interprofessional and collaborative.

The integration of PAs into models of care varies considerably across the country. In 2007, PAs were introduced in Ontario as a joint initiative of the Ministry of Health and Long-Term Care and the Ontario Medical Association. Through a series of demonstration projects, the PA role was implemented in a variety of clinical settings, including emergency departments, hospitals, primary care settings, and long-term care. As part of the primary care demonstration project, PAs joined community health centres (CHCs), physician practices, and family health teams (FHTs). Conference Board evaluation data show that FHTs have improved same-day access, increased patient enrolment, and enhanced quality of care, particularly around prevention. Manitoba has the longest history of PAs and funds them to work within the regional health authorities for specialty programs or emergency departments. Two years ago, Manitoba also began piloting PAs in family medicine practice models, with salaries still paid by the regional health authority. Manitoba's evaluation data show similar results to Ontario FHT data, and both offer insight into this project (although both are mostly qualitative from interviews and surveys). Alberta Health Services just completed a demonstration project; however, its evaluation data are currently being reviewed by Alberta Health and were unavailable at the time of writing. New Brunswick uses PAs in emergency departments, while the remaining parts of the country have been more sporadic in their use of PAs.

In Canada, there is a dearth of data on the impact of PAs, especially around cost. Major reviews (many systematic) of the literature demonstrate limitations due to a lack of comparator groups; poor study setting descriptions; a lack of randomized controlled trials; and the fact that the evidence is mainly from the U.S., where context is different. In determining the value of PAs in Canada, the following five Canadian studies are most relevant to inform modelling of demand:

1. Dies and others, 2016 prospective study of surgical care—PAs reduce resident workload and improve discharge rates.
2. Decloe and others, 2015 four-year retrospective study of an infectious disease consult service—PAs decrease both length of stay and time to consultation (although no specific cost data resulted).
3. Bohm and others, 2010 surgical services study—A PA saved a supervising physician an average of 204 hours per year.
4. Ducharme and others, 2009 review of six Ontario emergency departments—PAs reduced wait times by 1.9 times and “left without being seen rates” by 50 per cent.
5. Sigurdson, 2006 surgical services—PAs increased surgical productivity by 36.7 per cent by allowing two operating rooms to run simultaneously.

The value of PAs must be determined through a multi-dimensional lens of cost, outputs, and outcomes. Five themes arise from our review:

1. *Existing evidence:* Few studies touch demand for physician and physician assistant hours by type of specialty; in fact, impact studies tend to be more around access, waiting times, quality of care, and length of stay.
2. *Areas with modelling potential:* Primary care, emergency care services, and surgical care services are the most promising areas for further economic modelling.
3. *Further research:* More research studies are required to measure the quantitative impact of physician assistants on the Canadian health system.
4. *Knowledge mobilization:* Short, concise briefs on demonstration/pilot successes should be shared with stakeholders across the country.

5. *Ongoing evaluation*: If PA impact is shown in a more quantitative manner, ongoing evaluation and integration into broader workforce planning initiatives (especially around interprofessional collaboration) are required to ensure that supply and demand are balanced and outcomes are monitored over time.

To improve innovation and performance in the Canadian health system, new models of delivery are needed that are both interprofessional and collaborative. PAs have demonstrated that they can deliver similar, or even better, outputs or outcomes for designated competencies. If PAs can also show reductions in future costs, their integration and use can become an important tool to combat the growing demand for service, thus reducing the overall burden on Canada's lagging economy.

“ Life can only be understood backwards; but it must be lived forwards.”

Søren Kierkegaard

CHAPTER 1

Introduction and Background

Chapter Summary

- Physician assistants (PAs) are a relatively new type of health care provider in Canada, although they have a long history in the military.
- A literature review and two case studies were conducted to review evidence of physician assistant integration across the continuum of care.
- In addition to Canada, the report looks at impact evidence from the United States, the United Kingdom, and the Netherlands.

This project aims to better understand the role and impact that physician assistants (PAs) have in various health care settings across Canada as well as to review funding models that have enabled the successful and sustainable integration of PAs into various health systems. Its purpose is to estimate the value of physician assistants as a function of physician-time saved for selected health conditions or specialties and the attributable cost savings to the health care system.

Five objectives frame the deliverables for this endeavour:

1. Through a scoping literature review, yield a better understanding of the role and impact of physician assistants in health care in terms of the effectiveness and efficiency of health care service delivery and access to care in different health care settings across Canada.
2. Identify and describe PA models of care, applied in Canadian and international contexts; describe their integration in various health systems in terms of ease and sustainability; and review their health and economic impacts.
3. Estimate the impact of PAs on current and future demand for physician services and the efficiency contributions of PAs in terms of the potential direct health care cost savings attributable to physician-time saved for selected health conditions or specialties in Canada.
4. Describe several funding models for PAs based on a literature review and key informant interviews.
5. Identify next steps and discuss any recommendations arising from the research.

This report provides background and themes to better understand the role of physician assistants within health systems. It is the first report in this series and comprises a literature review and case studies of physician assistant models of care. It introduces other reports by

Information gathered from physicians and physician assistants informed the discussion on the successes/challenges of the integration of PAs.

presenting evidence to understand the integration of PAs across the continuum of care in various health systems, including Canada, the United States, the United Kingdom, and the Netherlands.

The report introduces PAs; discusses their role within primary care, long-term care, and acute care settings; and synthesizes relevant information about the effectiveness and efficiency of PAs in Canada and elsewhere. It presents a discussion of the history of this profession, the regulation of these professionals in various jurisdictions, and the main roles these professionals have adopted in various health systems as well as a summary of the evidence regarding their impact.

Methodology

The literature review is empirical (experimental and quasi-experimental studies) and includes systematic reviews/meta-analyses published in the past 10 years. Peer-reviewed literature used the Medical Subject health term “physician assistants” in combination with other key words: mid-level/midlevel, non-physician, physician associate, advanced care provider, impact, utilization, team, multidisciplinary, interprofessional, and scope of practice. We also accessed grey literature and included websites of the Canadian Association of Physician Assistants, the American Academy of Physician Assistants, provincial/territorial governments, and universities.

The report presents three cases where PAs have been successfully integrated into health care teams. Selection criteria for the case studies comprised the care continuum, including the deployment of PAs in emergency rooms, orthopaedic teams, mental health teams, and primary care teams. Only Ontario sites responded to the initial survey; this result may be due to the fact that Alberta and Manitoba were conducting pilot projects.

Using a standardized interview guide, information gathered from physicians and physician assistants informed the discussion on the successes/challenges of the integration of PAs and their impact in improving the quality of health care services and patient outcomes.

For the case studies, we relied on a review of available evidence (e.g., program documentation, formal evaluations) as well as key informant interviews conducted by telephone and e-mail. Only short vignettes are provided, as more detail of care models is the purview of a subsequent report in this series.

CHAPTER 2

Overview of the Physician Assistant Profession

Chapter Summary

- PAs are employed across a wide variety of settings, from primary care to acute care academic centres, but predominately in primary health care and emergency medicine.
- PAs are physician extenders whose scope of practice is highly dependent on the relationship between the individual PA and the supervising physician.
- With the exception of Manitoba and New Brunswick, PAs are unregulated across the country.
- Four PA education programs (in Ontario and Manitoba) train students in the medical model, typically over two years.

This chapter provides a brief glimpse into the physician assistant profession in Canada, with some international comparisons. It begins with the history and regulation of the profession over the last 50 years and provides demographic data along with an overview of employment figures and education programs available. Lastly, it touches upon liability and the roles of physician assistants as physician-extenders.

History and Regulation

In the mid-1960s, the PA profession began mostly with military medics in their role as medical assistants. Over 20 years later (1984), the first class of physician assistants graduated from the Canadian Armed Forces Medical Services School. Military PAs continue to bridge the gap between physicians and medical technicians in various austere, semi-isolated, and isolated locations, due primarily to a lack of military physicians. In 2001, the Canadian Association of Physician Assistants (CAPA) developed the first competency profile for civilian PAs. In 2009, this profile was accepted as the CAPA Scope of Practice and National Competency Profile for use in accrediting physician assistants' education programs by CMA Conjoint Accreditation Services. In 2015, this first profile evolved to CanMEDS-PA through the involvement of the Royal College of Physicians and Surgeons of Canada and the College of Family Physicians of Canada.¹ The Physician Assistant Certification Council of Canada (part of CAPA) maintains the PA certification process (and exam) based on CanMEDS-PA.²

1 See Canadian Association of Physician Assistants (CAPA) at <https://capa-acam.ca/> (accessed February 10, 2016).

2 CAPA, *CanMEDS-PA*.

The United States has gone the furthest in integrating PAs in the country's health care system.

PAs are largely unregulated across the country, with the exception of Manitoba (where PAs were regulated as clinical assistants from 1999–2009 and since 2009 as PAs) and New Brunswick, where PAs have been regulated by the provincial college of physicians and surgeons under provincial medical acts. Neither Alberta nor Ontario currently regulates PAs; rather, PAs practise under the supervision of a physician in those two provinces by delegation under the respective provincial medical act. Alberta hopes to regulate PAs in 2016. In 2007, in response to the shortage of physicians in the province, the Ontario government (in collaboration with the Ontario Medical Association) initiated a demonstration project on the impact of PAs on its health system. In 2012, the Minister of Health and Long-Term Care accepted the Health Professions Regulatory Advisory Council (HPRAC) recommendation against regulation of the profession based on its conclusion that the model of physician delegation under which PAs practice, coupled with the size of the profession, significantly mitigates any risk of harm to patients.³ However, in accepting this recommendation, the ministry committed to further explore HPRAC's recommendation to establish a registry for PAs. This decision is seen as a major barrier to wider acceptance.⁴

In 2010, Alberta's College of Physicians and Surgeons passed a bylaw allowing PAs to operate under a regulated member. It now has a voluntary and non-regulated membership category for PAs. Alberta also has a list of restricted activities in its *Government Organization Act* (schedule 7.1) and has indicated its intention to regulate PAs in the province. In 2009, Doctors of B.C. indicated support for PAs through a policy statement, and the College of Physicians and Surgeons of British Columbia has expressed its willingness to regulate PAs, but little further action has occurred. In Nova Scotia, clinical assistants can be licensed through the College of Physicians and Surgeons of Nova Scotia to ensure minimum competency levels.

3 Health Professions Regulatory Advisory Council (HPRAC), *Welcome to the HPRAC Website*.

4 Burrows, Vanstone, and Jones, *Physician Assistants in Canada*.

As in the Netherlands, PAs are new to the United Kingdom.

Internationally, the United States has gone the furthest in integrating PAs in the country's health care system. PAs have been in place since the mid-1960s. Each state regulates the practice of PAs, who are licensed to practise under a physician. Regulation can differ widely; however, the Accreditation Review Commission on Education for the Physician Assistant establishes the standards for the United States. The American Academy of Physician Assistants also stipulates that PA practice laws include licensure as the regulatory term; full prescriptive authority; scope of practice determined at the practice level; adaptable collaboration requirements; chart co-signature requirements determined at the practice level; and number of PAs a physician may supervise determined at the practice level.⁵ In the U.S., there are 199 accredited PA education programs, which by 2020 must all offer a graduate degree or risk losing accreditation.⁶ Most programs are three years in length and require 2,000 hours of clinical rotations. Once they have graduated, PAs write the National Commission on Certification of Physician Assistants' exam.

In 2001, four PAs began practising in the Netherlands. PA education programs, which are two and a half years in length, result in a master's degree. A work/education model is applied where PAs are employed two days per week under the supervision of a mentor physician (thus assuring a job upon graduation). Admission requirements for the program are twofold: a health care-related bachelor's degree and at least two years of clinical work experience. All registered Dutch PAs are licensed to practise.⁷

As in the Netherlands, PAs (often called physician associates) are new to the United Kingdom (U.K.). By the end of 2016, there are expected to be 12 programs for physician associates, all requiring a previous degree in health or life sciences. Depending on the university, either a

5 American Academy of Physician Assistants, *State Law Issues*.

6 Accreditation Review Commission on Education for the Physician Assistant, Inc., *Welcome*.

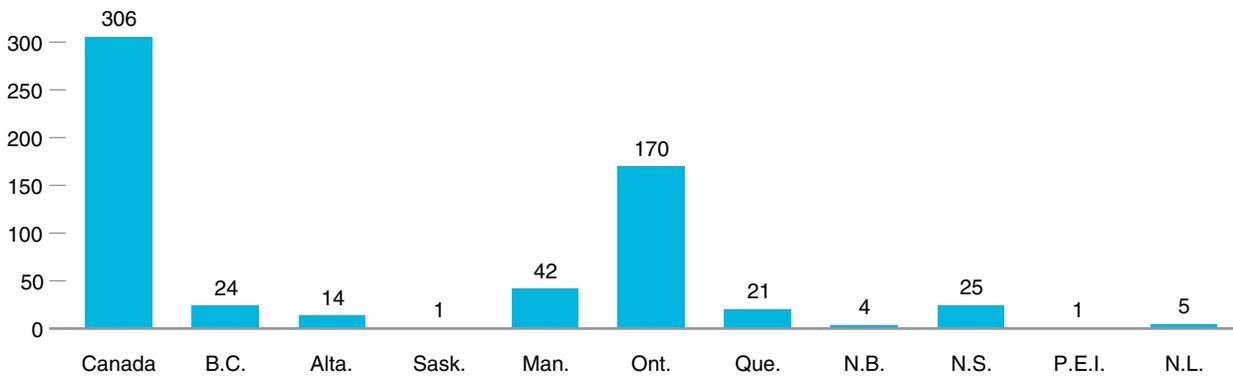
7 van den Driesschen and de Roo, "Physician Assistants in the Netherlands."

post-graduate diploma or master’s degree results, and there is a single national certification examination. PAs can practise in either general medicine or specialty areas.⁸

Employment

Detailed demographic data for Canada are lacking, given that many provinces don’t regulate physician assistants. However, the 2013 Canadian Institute for Health Information (CIHI) data show 306 PAs across Canada, mainly in the provinces of Ontario and Manitoba (where PA university programs are housed). (See Chart 1.) CIHI notes that since provincial registration is not a condition of practice in all provinces, the number of PAs may be higher.⁹ For example, in the same year CAPA data reported 308 regular members and 149 student members, with

Chart 1
Distribution of Physician Assistants Across Canada, 2013
 (number)



Source: Canadian Institute for Health Information.

8 Parle and Ennis, “Physician Associates.”

9 CIHI’s next aggregate data release is spring 2016 for 2014 data.

256 certified.¹⁰ Many provinces have funded demonstration projects to better understand the potential role of PAs and the effect on output and outcome of employing them. We discuss these later.

Non-military salaries for PAs typically range from \$75,000 to \$110,000, depending on the individual PA's education, experience, scope of practice, and hours worked.¹¹ Manitoba reports an initial PA salary scale of \$75,000 to \$110,000 per year,¹² whereas in Ontario salaries begin at \$75,000. Median salary in the U.S. is US\$95,000. Over a 13-year period (2000 to 2013), PA wages in the U.S. increased by 40 per cent compared with the cumulative inflation rate of 35.3 per cent.¹³

Today, PAs are employed across a wide variety of settings, from primary care to acute care academic centres. In 2012, Jones reported that almost half of PAs in Canada were employed in the military (46 per cent) followed by community hospitals (35 per cent). (See Chart 2.) One-quarter were female.¹⁴

CAPA found that most PAs are in the 45-to-54 age range (see Chart 3), although this demographic will change with the expansion of university spots.

PAs also work in a vast array of medical specialties across the country, with family medicine and emergency medicine the top two for both civilian and Canadian Armed Forces PAs. General internal medicine was the next most often indicated specialty focus for civilian PAs. There are also PAs who deliver medical support to business ventures such as mining and oil patch operations.

10 Jones and St-Pierre, "Physician Assistants in Canada."

11 Burrows, Vanstone, and Jones, *Physician Assistants in Canada*.

12 Physician and Clinical Assistants of Manitoba, *Physicians and Clinical Assistant Collective Agreement*.

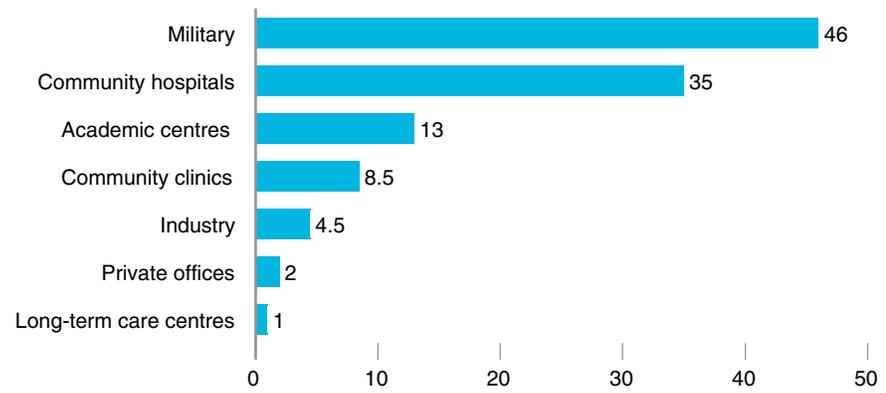
13 Quella, Brock, and Hooker, "Physician Assistant Wages and Employment, 2000–2025."

14 Jones, "Where the Canadian Physician Assistants Are in 2012."

Chart 2

Physician Assistant Practice by Setting, Canada, 2012

(per cent)

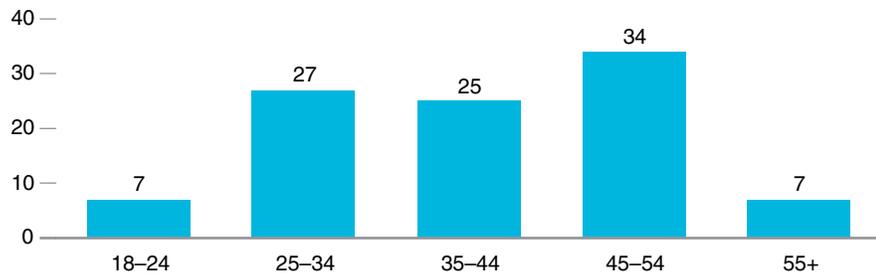


Source: CAPA National Survey, 2014.

Chart 3

Age of Physician Assistants, Canada, 2014

(per cent; n = 187)

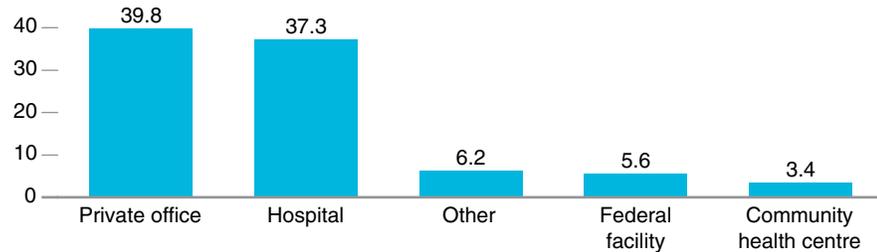


Source: CAPA National Survey, 2014.

PAs have a longer history in the U.S., with over 100,000 PAs practising in all medical specialties. They are most often seen in primary and ambulatory care settings. This observation is supported by the 2015 annual report of the National Commission on Certification of Physician Assistants, which shows the majority of PA employment in private

Chart 4
**Physician Assistant Distribution by Practice Setting,
United States, 2015**

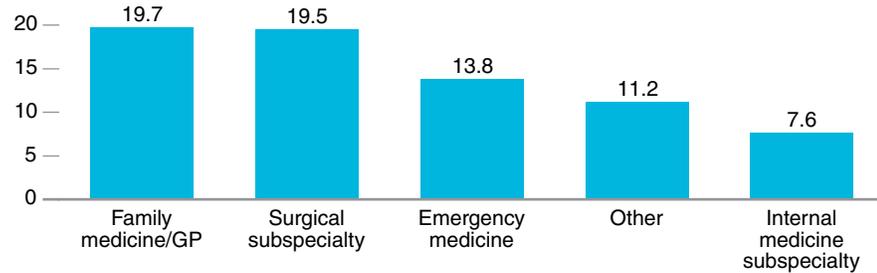
(per cent)



Source: National Commission on Certification of Physician Assistants, Inc.

Chart 5
**Physician Assistant Distribution by Practice Area,
United States, 2015**

(per cent)



Source: National Commission on Certification of Physician Assistants, Inc.

offices (39.8 per cent), with hospitals (37.3 per cent) a close second. (See Chart 4.)¹⁵ Most PAs work 40-hour weeks and will change specialties over their career.

In terms of distribution by practice areas, the top three in the U.S. are family medicine/general practice (19.7 per cent), surgical subspecialties (19.5 per cent), and emergency medicine (13.8 per cent). (See Chart 5.)

15 National Commission on Certification of Physician Assistants, Inc., *2015 State Report of Certified Physician Assistants*.

The clinical assistant (CA) role also exists in the provinces of Manitoba and Alberta, and Nova Scotia.

PAs were first introduced in the Netherlands in 2001, and by 2014 they numbered over 1,000.¹⁶ In the U.K., PAs are called physician associates and are new to the National Health Service (NHS). They number 250 and work mainly in secondary care. Within hospitals, most are in general adult medicine, with 20 per cent in surgical specialties (mainly trauma and orthopaedics). Twenty-five per cent work in general practice with tasks such as face-to-face urgent and non-urgent consultations, review of test results, and chronic disease management.¹⁷ By 2018, the NHS is expecting 400 to 450 PAs in its system.

Education

In addition to the Canadian Forces Medical School, three other education programs exist in Canada: University of Manitoba (established 2008), McMaster University (2008), and the PA Consortium (University of Toronto, Northern Ontario School of Medicine, and The Michener Institute of Education at UHN [2008]). Combined, these programs produce about 160 students annually. They operate in the medical model and are typically two years in length. (See Table 1.) Both Ontario schools' bachelor's degree programs require a minimum of 10 full courses or 20 half courses from a recognized university as a prerequisite for entrance. Manitoba offers a master's program, with admission requirements including a four-year bachelor's degree. The focus of education is "pathophysiology of disease, determining a differential diagnosis and implementing a treatment plan."¹⁸ Clinical rotations are an integral piece of the programs. If demand for PAs increases, capacity may become an issue for these schools. U.S.-trained PAs can help meet demand, as these professionals can practise in Canada.

The clinical assistant (CA) role also exists in the provinces of Manitoba, Alberta, and Nova Scotia; CAs are typically international medical graduates (IMGs) operating in a physician extender role. In 2014,

16 Timmermans and others, "Physician Assistants in Medical Ward Care."

17 Parle and Ennis, "Physician Associates."

18 University of Manitoba, *Master of Physician Assistant Studies*.

Table 1
Canadian Physician Assistant Schools

School	Admission requirements	Degree and length
Canadian Armed Forces Health Services Training Centre Program	Canadian Armed Forces member with 12 to 15 years of service, often as a medical assistant Qualification Level 6 Medical Technician; rank of sergeant; and junior leadership course or professional level	Bachelor of Science, Physician Assistant (degree conferred by University of Nebraska's School of Allied Health Professions PA Program)—two years of study
University of Manitoba (2008)	Four-year bachelor's degree, preferably in health science Minimum GPA of 3.0 in the last two full years of study Accepts 12 students per year	Master of Physician Assistant Studies—two years of study
McMaster University (2008)	Minimum GPA of 3.0 in two full years of study (or equivalent) Accepts 21 to 25 students per year	Bachelor of Health Sciences, Physician Assistant—two years full-time: first year is courses, second year is clinical training with year one of courses and second year of clinical training
University of Toronto/Northern Ontario School of Medicine/The Michener Institute of Education at UHN Consortium (2008)	Minimum GPA of 2.7 in two full years of study (or equivalent) Minimum of 910 hours of health care experience Accepts 17 students per year (2012) targeted for family medicine and rural communities	Bachelor of Science Physician Assistant Degree—two years full-time: first year is mostly delivered online, second year is clinical education

Source: The Conference Board of Canada.

Manitoba PAs and clinical assistants organized into one collective bargaining unit.¹⁹ Alberta offers a clinical and surgical assistant program for IMGs that involves a six-month assessment and evaluation.

The Canadian Medical Association (CMA) accredits PA education programs through its Conjoint Accreditation services. All existing programs have been accredited. In January 2016, the CMA announced it will divest itself of “responsibility for assessing and accrediting Canadian

19 Physician and Clinical Assistants of Manitoba, Physicians and Clinical Assistant Collective Agreement.

Canadian-trained
PAs cannot
practise in the
United States.

health education programs in designated health science professions within the next 24 months.”²⁰ Internationally trained physicians must complete an accredited PA program in order to be eligible to write the PACCC PA certification exam. Canadian-trained PAs cannot practise in the United States.

Liability

PAs are typically covered under their employer’s comprehensive general liability insurance; in Ontario hospitals, for example, this is Healthcare Insurance Reciprocal of Canada (HIROC). The Canadian Medical Protective Association (CMPA) will assist physicians who supervise PAs if a medico-liability issue arises from a delegated medical act. PAs are not eligible for liability insurance through CMPA, but liability insurance is available if the professional is a member of CAPA. Physicians are responsible to ensure that the PAs they work with have liability protection that is proportionate to the degree of risk of their delegated tasks; otherwise, negligence by the PA may expose the supervising physician to the risk of liability. Canadian-certified PAs have the option of accessing professional liability coverage from the insurer coordinated by CAPA.

Roles

The 2015 competency statements act as a resource for a PA’s role as a physician extender. Through delegated acts, activities can include conducting patient interviews, histories, and physical examinations; performing selected diagnostic and therapeutic interventions; providing medical orders and prescriptions; and counselling on preventive health care. The individual relationship between the PA and the supervising physician becomes the essential determinant of each PA’s individual

20 Canadian Medical Association (CMA), *Conjoint Accreditation Services*.

clinical role, within the context of the PA's competencies and the PA scope of practice.²¹ However, experience, education, clinical setting, and competencies are also important determining factors.²²

A formalized agreement between the physician and the PA that complies with provincial regulatory frameworks outlines the relationship. PAs can also be involved in administration, research, and patient education. Each organization has medical directives that detail the procedures and treatments that a PA can perform for a defined patient population under a supervising physician. The literature shows that there is still a need for better communication on the role and scope of practice of PAs and, particularly in Ontario, on how medical directives are most appropriately used.^{23, 24}

21 CAPA, *CanMEDS-PA*.

22 HPRAC, *Physician Assistants: Literature Review*.

23 HealthForceOntario, *Ontario Physician Assistant Implementation*.

24 Bowen, *Introduction of Physician Assistants Into Primary Care*.

CHAPTER 3

Models of Care and Impact

Chapter Summary

- Funding for PAs is derived from a number of sources: provincial governments, often through demonstration projects; block funding such as academic specialty groups; and direct funding from physicians.
- Physicians seem to accept the PA role well; however, remuneration mechanisms such as fee-for-service are a significant barrier to further integration of PAs into interprofessional collaborative care teams.
- Much of the impact evidence from a cost-effectiveness/efficiency perspective exists outside of Canada, mainly in the United States where PAs are more prevalent.

Physician Assistant Models of Care

As indicated previously, PAs are employed in a wide variety of settings. Although the use of PAs in Canada's health care system has expanded in the last two decades, there are still significant barriers to their integration. The most notable barrier is the lack of a stable model for funding and remuneration. Funding for PAs is derived from a number of sources: provincial governments, often through pilot and demonstration projects (Alberta and Ontario); block funding such as academic specialty groups (Manitoba and Ontario); direct funding from physicians (such as primary care fee-for-service physicians where access can be increased); and health delivery structures (such as regional health authorities and primary care networks in Alberta).¹ It is not uncommon for PAs to hold several part-time positions, including teaching positions.

Funding PAs through physician fee-for-service models (retrospective payment) is not done in Canada but is prevalent in the U.S., where PAs can have a billing number. Fee-for-service models can make it difficult for physicians to establish collaborative practices that include PAs. Physicians involved in capitation/blended-capitation models have more flexibility to engage in more interprofessional and collaborative team practices. Under capitation—a prospective payment approach—physicians are paid a certain amount for each patient enrolled/attached to their practice (often adjusted for risk, age, and sex). Physicians must provide care and services to the patient for a period of time without

1 Jones and St-Pierre, "Physician Assistants in Canada."

As of 2013, the Ministry of Health and Long-Term Care was still providing additional funding for PAs.

additional reimbursement. Mixed or blended payment systems are a mixture of retrospective and prospective payment systems. Blended capitation includes a capitation payment (for the number of enrolled patients) but also marginal reimbursements that are equal to or less than the marginal costs of treatment, that is, immunizations, mammography, and other promotion/prevention services.² The following provides an overview of provincial efforts to integrate PAs into their health care systems.

In 2007, PAs were first introduced through a demonstration project in **Ontario** (HealthForceOntario) within emergency departments, hospitals, primary care settings, and long-term care.³ These PAs were mainly retired Canadian Armed Forces PAs, U.S.-trained PAs, and international medical graduates who qualified to write the Canadian PA certification exam. The efforts to integrate PAs have continued mainly through employment support grants (two years, but funding has been extended) for Ontario PA education program graduates.⁴ Permanent funding for PA salaries has also been established for PA positions in several hospital settings and in primary care in Ontario, including some family health teams (FHTs). As of 2013, the Ministry of Health and Long-Term Care was still providing additional funding for PAs through the interprofessional health provider funding initiative for primary care. For this initiative, full salary funding was provided through non-FHT affiliated patient-enrolled models with three or more physicians.⁵ It is unclear how long this extra funding will continue and whether the model will remain sustainable once funding is removed.⁶

- 2 Tholl and Grimes, *Strengthening Primary Health Care in Alberta Through Family Care Clinics*.
- 3 HealthForceOntario, *Ontario's Physician Assistant Initiative*.
- 4 Vanstone, Boesveld, and Burrows, "Introducing Physician Assistants to Ontario."
- 5 See Ontario Ministry of Health and Long-Term Care at www.health.gov.on.ca (accessed February 16, 2016).
- 6 Vanstone, Boesveld, and Burrows, "Introducing Physician Assistants to Ontario."

Manitoba has the longest history of integrating PAs into various models of care.

Evaluation data from Ontario’s demonstration project are available, but are mainly qualitative around perceptions of reduced wait times in emergency departments, increased average daily billings for supervising physicians, and longer acute care lengths of stay.⁷ The data show no evidence of reduced health care costs in hospitals due to the presence of the PAs and suggest that PA employment costs could be funded by fee-for-service earnings.⁸ A 2013 Ontario qualitative study also corroborated these findings and showed that physicians believe that PAs can improve patient care, decrease wait times, increase access, and improve quality of life.⁹ Many noted that hiring PAs had the potential to increase income, but an increase in income is not expected. Barriers to employing PAs in Ontario include funding, supervision, training, and lack of clarity around delegation of acts.

Manitoba has the longest history of integrating PAs into various models of care. The Manitoba government funds PAs to work within the regional health authorities for specialty programs or emergency departments. Impact studies from this province do exist and are discussed in the next section. Since 2013, family medicine physicians have piloted PAs in three practice models within Manitoba (CHC, fee-for-service family practice, and a family medicine role within a hospital), later adding three more sites. The PA salary continues to be paid by the regional health authority. Manitoba’s data show similar results to Ontario for the implementation of PAs in primary care. (Ontario results came mainly from qualitative data—interviews and surveys.) Issues also arose in the fee-for-service setting around accountability and appropriate deliverables for PAs. The evaluation noted that “strategies to quantify these identified impacts, and to determine the impacts specifically attributable to the PA role, are needed.”¹⁰

7 Ibid.

8 HealthForceOntario, *Ontario Physician Assistant Implementation*.

9 Taylor and others, “Qualitative Study of Employment of Physician Assistants by Physicians.”

10 Bowen, *Introduction of Physician Assistants Into Primary Care*.

In 2009, **New Brunswick** undertook a feasibility study on PAs; the analysis recommended a pilot in emergency departments.¹¹ In 2013, **Alberta** Health Services (AHS) began a two-year demonstration project to evaluate up to 10 PAs as members of teams in various clinical settings across the province. The project is now complete and PAs have transitioned into the AHS operations. Evaluation data have been requested from both AHS and Alberta Health, and hopefully will be forthcoming during this project.

Hamilton Family Health Team

In 2005, Ontario introduced family health teams (FHTs) to improve access to primary care services through the use of an interprofessional, team-based model of care. A five-year evaluation by the Conference Board showed the first goals were achieved in different ways. Patients are enrolled with either an individual family physician or a group. Most physicians in FHTs are remunerated through either blended salary or capitation. Physician assistants are part of this model and help physicians to further focus on disease prevention, health promotion, and chronic disease management.

Conversations with Ontario's largest FHT, located in Hamilton (166 physicians) revealed that the FHT directly employs three PAs. Two of the three work in multiple practices doing home visits and managing patients with complex care needs. There are also a number of PAs who work for Hamilton FHT physicians but are paid directly by the physicians. This specific practice shows that the use of PAs has improved the following:

- Access—Wait times have been reduced and most patients are able to have same-day access for urgent needs (decreasing the number of patients going to urgent care and ER for care).
- Capacity—Roster size has increased (an estimated 300 more patients enrolled).
- Quality improvement—Prevention and promotion activities have been enhanced.

11 New Brunswick Stakeholder Committee, *Report on the Feasibility of Introducing Physician Assistants in New Brunswick*.

The individual relationship and experience between the PA and the supervising physician are the main determinants of a PA's individual clinical role. Medical directives outline the PA's physician extender role and are supplemented with daily chats and messaging through the electronic medical record. The PA in this team sees 20 to 30 patients a day, taking histories, conducting clinical exams, ordering lab and diagnostic tests, interpreting tests, diagnosing, and prescribing and creating a medical plan for the patient. The PA treats acute, chronic diseases, the elderly, and children, performing physicals and preventive health screening. All of these are done under medical directives.

Orthopaedics—Ottawa Hospital

Comprising of three sites, the Ottawa Hospital is one of the largest teaching hospitals in Canada, performing about 35,000 surgeries each year. In 2011, three spinal surgeons integrated a PA into an outpatient clinic at this university hospital. Initially, funding for the position was through two-year grant funding, but now physicians pay the salary of the PA out of their own income. The PA mainly undertakes new patient consultations in orthopaedic and spine surgery. Consultation can include reviewing patient history/concerns, performing physical examinations, reviewing or ordering investigations, diagnosing patients, and determining the treatment strategy. This may involve prescribing specific therapies or medications, or expediting the patient to be seen by one of the supervising physicians for surgery. All of this is done with a good amount of autonomy under the scope and delegation of the three supervising physicians. The PA also seeks consent by patients for surgery, assists in the operating room, runs the halo cervical immobilizer program, and helps out on the wards intermittently, depending on the needs of the care team. Nurse and patient education can also be provided along with help to research studies performed by the group. An 80-page document contains the PA medical directives.

PAs have increased productivity through the addition of extra consultation clinics that focus on lumbar spine pain and run alongside regular spine outpatient clinics. This has reduced surgical wait times of the spinal surgeons' practice from a maximum of five years to six months. (Most patients are now seen within eight weeks.) The PA can see 15 new consults a day (40 to 60 per week). An evaluation of 18 halo patients for spinal surgery (9 by the orthopaedic surgery team, which had a PA, and 9 by the neurosurgery team, which had other providers) analyzed cost savings and showed \$50,000 in savings because of

PAs in PA-only models spend more time on direct patient care.

reduced emergency room visits and shorter in-patient stay. As well, none of the orthopaedic surgery patients were admitted for rehabilitation (saving in-patient rehabilitation costs) and, overall, there was a decrease in adverse events (halo-related complications).

Internationally, the U.S. has the most varied approaches to using PAs to provide care and service: These professionals can be found in every setting and specialty area. PA remuneration from public payors (i.e., Medicare, Medicaid) is through a fee-for-service model, often 85 per cent of the physician's fee schedule; nearly all private payors cover PA services.¹² With the Affordable Care Act, PAs are providing primary care services to wider populations now covered by public health insurance, especially through community health centres.¹³ Veterans Health Administration conducted a survey of the scope of practice of nurse practitioners (NPs) and PAs in 118 acute care hospitals and found similar scopes of practice, caseloads, and patient/nurse manager satisfaction.¹⁴

Few studies detail the collaborative relationships with PAs. However, a compelling 2015 Netherland study of PAs in four different models of care examined tasks performed and showed that direct and indirect patient care on a hospital ward does differ. The researchers determined that PAs in PA-only models spend more time on direct patient care and had the highest provider continuity. Another Dutch cross-sectional study on general skill levels showed that PA students and physicians score about equal on history-taking, physical examinations, and communication.¹⁵

12 See American Academy of Physician Assistants at www.aapa.org/ (accessed February 26, 2016).

13 Henry, "Physician Assistants, Nurse Practitioners, and Community Health Centers."

14 Kartha and others, "Nurse Practitioner and Physician Assistant Scope of Practice."

15 van Vught and others, "Analysis of the Level of General Clinical Skills of Physician Assistant Students."

In Canada, there are limited cost-effectiveness data, on the impact of PAs.

Impact of Physician Assistants in Health Care Systems

In Canada, there are limited data, especially cost-effectiveness data, on the impact of PAs. A recent study conducted in Ontario¹⁶ stated the following:

Systematic reviews of evidence about PAs in the context of primary care, intensive care, and emergency care have demonstrated that most existing publications focus on describing the types of tasks and roles that PAs are employed in, and very little generalizable evidence is available about their efficacy at performing those tasks, impact on patient outcomes, or cost-effectiveness.

Other studies have reached similar conclusions.^{17,18} Major limitations cited have included a lack of comparator groups; small sample sizes; poor study setting descriptions; and the fact that evidence comes mainly from the U.S., where PAs are employed quite differently. Many of these limitations are still prevalent; however, additional studies have emerged to better understand the impact of PAs, especially on current and future demand for physician services and efficiency contributions such as potential direct health care cost savings. Some of the benefits observed include:

- reductions in resident and physician workload (saving physician-time)
- improvements in discharge rates
- decreases in length of stay
- increases in health care procedures (increased health care productivity)
- reductions in wait times
- reductions in health care costs

16 Vanstone, Boesveld, and Burrows, "Introducing Physician Assistants to Ontario."

17 Gafni, Birch, and Buckley, *Economic Analysis of Physician Assistants in Ontario*.

18 HPRAC, *Physician Assistants: A Literature Review*.

The 2009 review of six Ontario emergency departments showed that PAs reduced wait times by 1.9 times.

Table 2 contains a synthesis of the most relevant studies from Canada, the U.S., the U.K., and the Netherlands. Five Canadian studies seem to hold the most promise for informing the development of a model to estimate the value of physician assistants as a function of physician-time saved for selected health conditions or specialties and the attributable cost savings to the health care system.

The first, a 2016 prospective study of surgical care by Dies and others, showed that PAs reduce resident workload (fewer hours spent on the electronic medical record [EMR]) and improve discharge rates.¹⁹ In their four-year retrospective study of an infectious disease consult service, Decloe and others showed decreases in length of stay of 3.6 days and time to consultation of seven hours. (No cost savings data resulted.)²⁰ A 2010 surgical services study found a PA saved a supervising physician an average of 204 hours per year. The number of primary joint procedures increased by 42 per cent because orthopaedic surgeons were able to implement a double operating room model, which reduced average wait times from 44 weeks to 30 weeks.²¹

The 2009 review of six Ontario emergency departments by Ducharme and others looked at the impact of PAs on patient flow, wait times, and the proportion of patients who left without being seen. It showed that PAs reduced wait times by 1.9 times and “left without being seen” rates by 50 per cent.²² Ten years ago, Sigurdson found PAs could safely perform 48.8 per cent of minor procedures, 28.6 per cent of elective procedures, and 20.5 per cent of wait-list procedures, increasing surgical productivity by 36.7 per cent by allowing two operating rooms to run simultaneously.²³ In addition, Manitoba’s family medicine early pilot evaluation data show

19 Dies and others, “Physician Assistants Reduce Resident Workload and Improve Care.”

20 Decloe and others, “Improving Health Care Efficiency Through the Integration of a Physician Assistant.”

21 Bohm and others, “Experience With Physician Assistants in a Canadian Arthroplasty Program.”

22 Ducharme and others, “The Impact on Patient Flow After the Integration of Nurse Practitioners and Physician Assistants.”

23 Sigurdson, *Meeting Challenges in the Delivery of Surgical Care*.

In the United Kingdom, PAs are new providers of care within the National Health Services.

that early impacts are most evident in two settings: hospital-based family medicine placements (e.g., increased number of unattached patients, improved satisfaction, facilitated admission/discharge) and over-panelled practices (e.g., more motivation to change practice patterns to meet patient needs, physician more generally well established).²⁴

In the United Kingdom (mainly England), PAs, often called physician associates, are new providers of care within the National Health Services. In 2013, the NHS attempted to fill the supply gap of anaesthetists through a two-year physician assistant pilot (anaesthesia). This was in opposition to the Association of Anaesthetists of Great Britain and Ireland, which, in 2010, felt that only a physician-only service can maintain the highest standards of care. In a follow-up, a 2014 Cochrane Database review resulted in no definitive statement on whether one type of anaesthesia care was better than the other (i.e., with or without PAs).²⁵ A 2015 primary care study in the NHS showed that PAs can take on a portion of physicians' clinical workloads. In this case, same-day appointments showed similar outcomes and processes at a lower cost.²⁶ The U.K.'s intention is to alleviate concerns on the availability of GPs. Shorter training and education of PAs as compared with GPs, combined with lower salaries, can result in savings and free up GP time to concentrate on more complex cases. Within the U.K., issues such as legal authority to prescribe require further discussions if using PAs in primary care is to be fully realized.

Most impact studies for PAs come from the United States; the most relevant are highlighted in Table 2. The U.S. is realizing that under the Affordable Care Act, PAs can be used to improve access and quality of care under public health insurance.

24 Bowen, *Introduction of Physician Assistants Into Primary Care*.

25 Lewis and others, "Physician Anaesthetists Versus Non-Physician Providers of Anaesthesia."

26 Drennan and others, "Physician Associates and GPs in Primary Care."

Table 2
Impact Studies of Physician Assistants in Health Care Systems

Source	Setting/Intervention	Impact
Dies and others, "Physician Assistants Reduce Resident Workload."	Canadian academic hospital surgical care —Prospective study examined the effect of two PAs on patient discharges, resident workload, and resident perceptions of PAs on a surgical team over 13 months.	PAs reduced resident workload and improved care. Teams with PAs had 0.5 per cent late discharge (after 10 a.m.) and 16 per cent early discharge rate. Junior residents with PA on the team spent fewer hours on electronic medical records (EMRs). Residents reported PAs significantly improved their rotation and quality of care.
Decloe and others, "Improving Health Care Efficiency."	Canadian hospital infectious diseases —Four-year retrospective case-control study (pre- and post-implementation) on integration of PA into an infectious diseases consult service at a large urban community hospital.	With introduction of PAs, decrease in time to consultation from 21.4 hours to 14.3 hours (the PAs' primary job responsibility). Length of stay (LOS) decreased by 3.6 days more than that seen in matched hospital-wide controls. Mortality not statistically significant.
Drennan and others, "Physician Associates and GPs."	U.K. primary care —Compared outcomes and costs of same-day requested consultations by PAs with those of general practitioners (GPs) in England. Observational study of 2,086 patient records presenting at same-day appointments in 12 general practices. Records of initial consultations of 79 per cent of PAs and 48% of GPs were judged appropriate by independent GPs.	Processes and outcomes of PA and GP consultations for same-day appointment patients were similar at a lower cost. Specifically, no significant differences in rates of re-consultation (rate ratio 1.24). No differences in rates of diagnostic tests ordered (1.08), referrals (0.95), prescriptions issued (1.16), or patient satisfaction (1.00).
Hooker and Muchow, "Modifying State Laws."	U.S. primary care —Cost analysis undertaken on modifying Alabama state law, which has restrictive legislation on scope of practice for NPs and PAs, such as prescribing. Model changed scopes to upper quartile of collaborative legislation (like Washington and Arizona).	Model showed forecast utilization of PAs and NPs if broadened scopes were allowed like some states do. Found that changes in legislation could result in a net saving of US\$729 million over 10 years (expenditures per primary care visit).
Kahn and others, "Impact of Advanced Practice Providers."	U.S. hospital critical care —Surgical residents' critical care experience with advanced practice practitioners (APPs, i.e., NPs and PAs). In U.S., implementation of work-hour restrictions for resident training has introduced new concerns in patient care, including increased percentage of time patient is under the care of a cross-covering physician, hand-off errors, decreased continuity of care, and a perception of a lack of physician ownership of patients.	Most residents felt that APPs have positive or neutral effect on intensive care unit (ICU) experience. Survey of residents showed respondents believed APPs reduced resident workload (79.8 per cent), teaching protocols, and/or guidelines (60.3 per cent); enhanced patient care (60.3 per cent); and enhanced communication (50.5 per cent).
Kleinpell and others, "Provider to Patient Ratios."	U.S. hospital critical care —Provider-to-patient ratios for nurse practitioners and physician assistants.	Mean provider-to-patient ratios in intensive care were 1 to 5. In pediatric intensive care, mean ratio of nurse practitioners to patients was 1 to 4. Factors that affected NP and PA ratios: severity of illness, number of patients in the unit, number of providers in the unit, patient diagnosis, number of physicians in the unit, time of day, and number of fellows and medical residents on service.
Timmermans and others, "Physician Assistants in Medical Ward Care."	Netherlands medical ward —Compared PAs across four different organizational models in 34 wards across 23 hospitals.	Showed variations in time per task, time per bed, and provider continuity. Wards with PAs had the highest provider continuity. PAs spend relatively more time on direct patient care; MDs spend relatively more time on indirect patient care. PAs spend more hours on quality projects; MDs spend more time on scientific research.

(continued ...)

Table 2 (cont'd)
Impact Studies of Physician Assistants in Health Care Systems

Source	Setting/Intervention	Impact
Virani and others, "Provider Type and Quality."	U.S. outpatient cardiovascular disease care —More physicians needed to provide services under Affordable Care Act. Within the American College of Cardiology's PINNACLE Registry, compared quality of coronary artery disease (CAD), heart failure, and atrial fibrillation care delivered by physicians and APPs for outpatient visits over 2012. Study included 883 providers (716 physicians and 167 APPs) in 41 practices who cared for 459,669 patients. Mean number of patients seen by APPs (260.7) was lower compared with that seen by physicians (581.2).	Study found comparable quality of outpatient measures for cardiovascular care in a collaborative care model (using both APPs and physicians) and a physician-only model. Compliance with most CAD, heart failure, and atrial fibrillation measures was comparable, except for a higher rate of smoking cessation screening and intervention and cardiac rehabilitation referral among patients receiving care from APPs.
Costa and others, "Nurse Practitioner/Physician Assistant Staffing."	U.S. acute care hospital critical care —Retrospective cohort study looking at NP/PA staffing and critical care mortality.	NPs/PAs appear to be safe to use on ICU teams. Unadjusted mortality was similar in ICUs with and without NP/PA staffing (13.7 per cent vs. 14.4 per cent).
Lewis and others, "Physician Anaesthetists Versus Non-Physician Providers."	U.K. hospital surgical services —Physician anaesthetist vs. non-physician providers of anaesthesia (including PAs) for surgical patients. Assessed safety and effectiveness of different anaesthetic providers for patients undergoing surgical procedures under general, regional, or epidural anaesthetic.	Some studies showed small and inconsistent differences in some outcomes, but overall evidence found the "quality and nature of physician anaesthetists versus non-physician providers of anaesthesia for surgical patients are insufficient to draw firm conclusions about relative benefits and risks of the different models of anaesthetic provision." This Cochrane Database review had no definitive statement on superiority of one type of anaesthesia care over another.
Theunissen and others, "Fast Track by Physician Assistants."	Netherlands emergency department —Fast track (patients with simple, non-complex needs) by physician assistants of trauma patients. Prospective treatment intervention study.	Fast track shortened waiting (–41 minutes) and turnaround times (–21 minutes in length of stay) of trauma patients in an emergency department with low or moderate urgency, but also urgent patients.
Everett and others, "Physician Assistants and Nurse Practitioners."	U.S. primary care —PA and NPs on teams caring for Medicare patients with diabetes.	Study showed that patient panels with PAs/NPs as usual providers had higher proportions of diabetic patients with indicators of social complexity including Medicaid, entitlement due to disability, dementia, and depression.
Garland and Gershengorn, "Staffing in ICUs."	U.S. acute care hospital critical care —Review of the literature comparing physician staffing of ICUs.	Optimal ICU staffing may depend on ICU characteristics. Use of PAs appears to be safe and comparable to other staffing models in ICU. However, no optimal model resulted; therefore, more quantitative evaluation needed.
Gershengorn and others, "Impact of Non-Physician Staffing."	U.S. acute care hospital critical care —Retrospective review of 590 admissions to two medical ICUs at one hospital. One ICU used PAs/NPs (MICU-NP/PA) and the other medical residents (MICU-Res).	Outcomes showed hospital mortality was similar (32 per cent in both cases): MICU LOS (4.22 days for MICU-NP/PA vs. 4.44 days for MICU-RES) and hospital LOS (14.01 for MICU-NP/PA vs. 13.74 days for MICU-RES). Discharge to a skilled care facility (vs. home) was similar (37.1 per cent for MICU-NP/PA vs. 32.5 per cent for MICU-RES). After multivariate adjustment, MICU staffing type was not associated with hospital mortality, MICU LOS, hospital LOS, or post-hospital discharge destination.

(continued ...)

Table 2 (cont'd)
Impact Studies of Physician Assistants in Health Care Systems

Source	Setting/Intervention	Impact
Moote and others, "Physician Assistant and Nurse Practitioner Utilization."	U.S. acute care academic health centers (AMCs) —National survey of PA and NP utilization.	Survey found 69 per cent of AMCs had not successfully documented the financial impact of PA/NP practice or outcomes associated with individual PA or NP care. Main reason for employing PAs/NPs was Accreditation Council for Graduate Medical Education resident duty hour restrictions followed by increasing patient throughput, increasing patient access, improving patient safety/quality, reducing length of stay, and improving continuity of care.
Bohm and others, "Experience With Physician Assistants."	Canadian acute care hospital surgical services —Effect of PAs working in an arthroplasty practice (with orthopedic surgeons), including costs, time savings for surgeons, and the effects on surgical throughput and waiting time.	PAs were found to save supervising physician, on average, 204 hours per year. Number of primary joint procedures increased by 42 per cent because orthopaedic surgeons were able to implement a double operating room model, which reduced average wait times from 44 weeks to 30 weeks.
Ducharme and others, "The Impact on Patient Flow."	Canadian hospital emergency department —Six Ontario emergency departments (EDs) looked at the impact of PAs and NPs on patient flow, wait times, and proportions of patients who left without being seen.	With PA or NP involvement the wait times, lengths of stay, and proportion of patients who left without being seen were significantly reduced, helping to improve efficiency of EDs. Data were better for NPs overall; however, when PA was directly involved in patient care, patients were 1.6 times more likely to be seen within the wait-time benchmarks. Lengths of stay were 30 per cent lower when PAs were involved. When PA was not on duty, proportion of patients who left without being seen was 44 per cent.
Morgan and others, "Impact of Physician Assistant Care."	U.S. primary care —Retrospective cohort study compared the number of office-based visits per year between adults for whom PAs provided 30 per cent of visits and adults cared for by physicians only.	Use of PAs for a significant portion of patient care realized about 16 per cent fewer office visits a year (after case-mix adjustment). Decrease in visits not offset by increased resource use in other settings, such as emergency departments. Also no decrease in patient satisfaction.
Roy and others, "Implementation of a Physician Assistant/Hospitalist Service."	U.S. acute care hospital —Retrospective cohort study of large urban academic medical centre in United States. Compared PA/hospitalist service to traditional house staff service.	After case-mix adjustment, total cost of care was marginally lower on the study service. LOS was not significantly different compared with house staff services. No difference was seen in in-patient mortality, ICU transfers, readmissions, or patient satisfaction.
Sigurdson, <i>Meeting Challenges in the Delivery.</i>	Canada acute care hospital surgical services —Use of PAs and anaesthesia assistants in operating rooms in Halifax and effect on physician time.	Study showed PAs could safely perform 48.8 per cent of minor procedures, 28.6 per cent of elective procedures, and 20.5 per cent of wait-list procedures. PA could increase surgical productivity by 36.7 per cent by allowing two operating rooms to run simultaneously. Determined that with further experience, it may be possible to run two general anaesthesia rooms under the supervision of a single anaesthetist.

Primary care, emergency care services, and surgical care services hold the most promise for further economic modelling.

A 2015 retrospective study illustrated that a collaborative care delivery model, using both physicians and advanced practice providers (PAs and NPs) may deliver an overall comparable quality of outpatient cardiovascular care when compared to a physician-only model.²⁷ Numerous studies and systematic reviews support this finding for other populations, including geriatrics in community practices and rural regions.^{28,29,30} But in terms of economic impact, there are fewer data. A 2015 economic modelling study determined that broadening the scope of practice of PAs and nurse practitioners through changes in legislation for one state (Alabama) could result in a net saving of US\$729 million over 10 years (expenditures per primary care visit).³¹

Very few studies have been done on the impact of PAs in the Netherlands, especially around cost-effectiveness. A notable exception is a 2014 prospective treatment study that demonstrated that PAs reduce waiting times and length of stay in emergency departments through fast-tracking low or moderate cases.³²

From the very limited data available, especially in Canada, on the impact of PAs on physician productivity and reduction in future costs, three areas hold the most promise for further economic modelling. These are primary care, emergency care services, and surgical care services. The final decision will require a balanced perspective that looks at the existing evidence but also considers health reform priorities (which vary by province/territory) that tend to address the more underserved areas of the Canadian health system, where chronic problems persist around equity, access, and cost. Exhibit 1 provides a visual for these considerations.

27 Virani and others, "Provider Type and Quality of Outpatient Cardiovascular Disease Care."

28 Lichtenstein, Reuben, and Karlamangla, "Effect of Physician Delegation to Other Healthcare Providers."

29 Henry, Hooker, and Yates, "The Role of Physician Assistants in Rural Health Care."

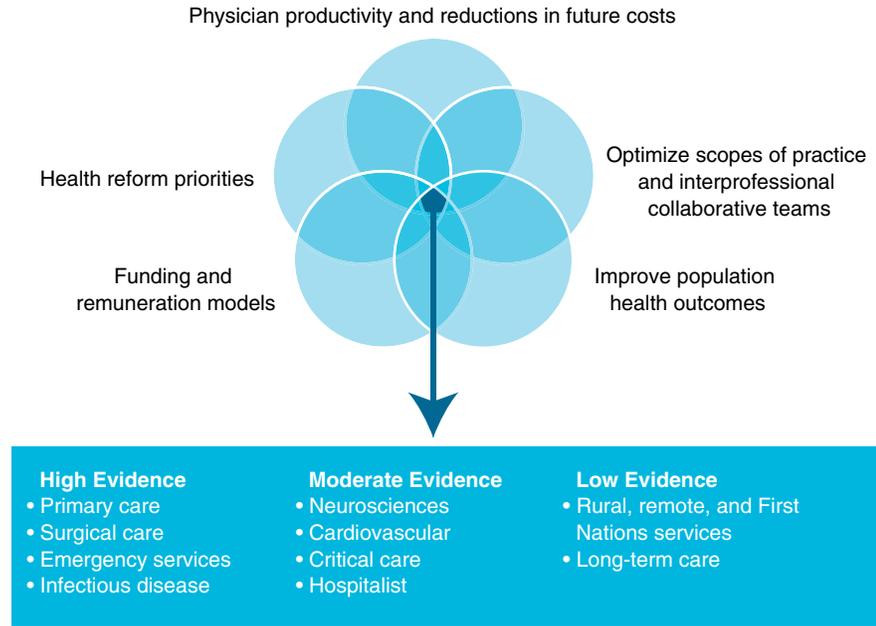
30 Halter and others, "The Contribution of Physician Assistants in Primary Care."

31 Hooker and Muchow, "Modifying State Laws for Nurse Practitioners and Physician Assistants."

32 Theunissen and others, "Fast Track by Physician Assistants Shortens Waiting and Turnaround Times."

Exhibit 1

Evidence and Stakeholder Interest Matrix for Modelling



Source: The Conference Board of Canada.

Given the low level of evidence that exists on the use of PAs in rural, remote, and First Nations teams, as well as in long-term care, and the growth in demand that exist in these areas, more research is needed to understand how PAs could improve population health outcomes in these settings.

CHAPTER 4

Conclusion

Chapter Summary

- Few studies touch demand for physician and physician assistant hours by type of specialty; in fact, impact studies tend to be more around access, waiting times, quality of care, and length of stay.
- Primary care, emergency care services, and surgical care services are the most promising areas for further economic modelling.
- More prospective and retrospective case-control research studies are needed to measure the quantitative impact of physician assistants on the Canadian health system in order to optimize their role and the value they offer to the health care system.

Physician assistants are unique health care providers and their scope of practice depends directly on the physician–physician assistant relationship. This is achieved either through regulation or, as in Ontario, through individual medical directives whose number and content vary widely across settings and practices and that reflect a physician assistant’s education, experience, and competencies.

Internationally, PAs’ numbers have expanded rapidly, especially in countries like the United States, the United Kingdom, and the Netherlands. Despite this, their acceptance in Canada remains low. There are studies available demonstrating the multiple benefits that PAs offer to health care systems, from reductions in physicians’ workloads and increased productivity, to decreased health care costs. But before these professionals can optimize their contributions to Canada’s health care systems, funding and remuneration barriers should be removed. In some provinces the lack of regulation is still a significant barrier, as it is seen as a safety issue by other provider groups. In addition, if provincial demonstration projects continue to be successful, additional capacity will be required for both education programs and mentoring in the workplace.

The value of PAs must be determined through a multi-dimensional lens of cost, outputs, and outcomes. Five themes arise from this review:

1. *Existing evidence:* The ability of PAs to safely provide care under the supervision of a physician but within their area of competence has been well documented across a wide range of settings and practice areas. Much of the evidence on impact exists outside of Canada, specifically in the United States where context can be quite different. Few studies touch demand for physician and physician assistant hours by type of specialty; in fact, impact studies tend to be more around access, waiting times, quality of care, and length of stay. Lack of Canadian comparator groups makes research difficult.

To improve innovation and performance in the Canadian health system, new models of delivery are needed.

2. *Areas with modelling potential:* Given the challenges created by the lack of comprehensive evidence plus the limited data that do exist, primary care, emergency care services, and surgical care services seem to be the most promising areas for further economic modelling.
3. *Further research:* Building a better business case for physician assistants in Canada requires more prospective, or even retrospective, case-control research studies to measure the quantitative impact of physician assistants on the Canadian health system. Encouragement and research dollars should be provided to further document impact in various contexts.
4. *Knowledge mobilization:* Translating evidence into practice can go a long way in changing policies and practices. Communications on demonstration/pilot successes and how to overcome challenges (i.e., barriers and facilitators) should be shared with stakeholders across the country, especially on leading practices.
5. *Ongoing evaluation:* If PA impact is shown in a more quantitative manner, ongoing evaluation and integration into broader workforce planning initiatives (especially around interprofessional collaboration) are required to ensure supply and demand are balanced and outcomes are monitored over time.

To improve innovation and performance in the Canadian health system, new models of delivery are needed that are both interprofessional and collaborative. Several projects and programs have demonstrated that PAs can deliver similar, or even better, outputs or outcomes for designated competencies with respect to other health professionals. The wider integration of PAs within interprofessional teams in Canada should be considered when addressing the unprecedented growth in demand for services resulting from our demographic challenge.

“ Life can only be understood backwards; but it must be lived forwards.”

Søren Kierkegaard

APPENDIX A

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