

EXPLORING PHYSICIAN ASSISTANT ROLE INTEGRATION
IN THE ONTARIO HEALTHCARE SYSTEM

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IN THE ONTARIO HEALTHCARE SYSTEM

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LAY ABSTRACT

Physician Assistants (PAs) are a new health care profession in Ontario, and were introduced by the Ministry of Health and Long Term Care (MOHLTC) in 2006 to help increase access to care and decrease wait times for patients. PAs are trained to work with physicians to extend healthcare services. This research study was undertaken to explore how the PA role has been integrated into number of health care settings, including family practices, emergency departments, general surgery and inpatient medicine settings. The research design is a qualitative case study, which allows for an in-depth exploration of the PA role. Findings revealed that PAs are flexible, collaborative, and adaptable members of healthcare teams in Ontario, who have an interest in enhancing patient care. Despite these benefits, role optimization is often limited by factors such as lack of funding and resistance from other healthcare providers. The findings from this study help fill research gaps around the PA profession in Ontario, and will help inform stakeholders interested in optimizing the impact of PAs in the Ontario healthcare system.

ABSTRACT

Background: The Ministry of Health and Long Term Care (MOHLTC) introduced Physician Assistants (PAs) into the Ontario health care system in 2006 to help increase patient access to care, decrease wait times, and improve continuity of care. As a new addition to Ontario, little research exists to describe the roles and contributions of PAs. The aim of this dissertation is to explore PA role integration through an in-depth analysis of setting and role descriptions, barriers and facilitators of role integration, and healthcare provider perceptions.

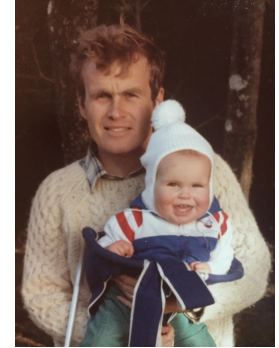
Methods: An exploratory, multiple-case study was used to examine PA role integration in four clinical settings: family medicine, emergency medicine, general surgery, and inpatient medicine. Inductive thematic analysis was used within each of the four cases and for the cross-case thematic analysis.

Results: Forty-six health care providers and administrators were interviewed across 19 different healthcare sites. Support for PA contributions across various health care settings, the importance of role awareness, supervisory relationship attributes, and role vulnerability (in relation to sustainability and funding) are interconnected and dynamic in general surgery, inpatient medicine, emergency department and family medicine settings. These findings demonstrate how the flexible and adaptable nature of the PA role and the PAs ability to build relationships allows for the establishment of interprofessional, collaborative, and person-centered care.

Conclusions: This dissertation provides a rich understanding of the role of PAs in the Ontario healthcare system through an exploration of role definition, impact on patient care, and professional perceptions. The findings from this dissertation are important from a broad systems perspective as the results help fill existing knowledge and practice gaps regarding the role of PAs, and will help inform the design of human health resource research in order to optimize health care system efficiencies.

ACKNOWLEDGEMENTS

This thesis is dedicated to my father, John F. Burrows, who was my biggest supporter throughout my education and decision to pursue graduate school with two children. I lost my strongest source of encouragement when he passed away from a brain tumor in the middle of my studies in July 2017. Navigating the health care system for a parent with a sudden terminal diagnosis put so many aspects of this dissertation into perspective. He would be happy to know how much I continue to value his technical editing expertise, his love of life-long learning, and his reminder to always do my best.



I am thankful for all of the patients, students, families, educators, physicians and other health professionals who have supported the role of Physician Assistants as they continue to contribute to the delivery of healthcare in Ontario and gain momentum across Canada.

A special thank you to my thesis supervisor, Dr. Meredith Vanstone: for putting up with my indecisiveness, procrastination, and transition from full time student to Assistant Dean. Your exceptional patience, expertise, quick turnaround times and mentorship over the past few years enriched my entire graduate experience. I feel very fortunate to be your inaugural PhD student, and know you will continue to build a brilliant career.

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Thanks to my children, Kalia and Finn, who were excellent (and sometimes annoying) distractions throughout four years of graduate studies. Thanks to Jay for your support and for keeping up with the wake of neglect I left behind every time I was busy with research or writing. Thank you to all of my exceptional friends and colleagues for your support and encouragement, especially Firas for forcing yourself into my group in 1st year and being unconditionally present ever since, and Em for always being a brilliant friend and PA colleague.

“By sharing power with other professions, physicians may not necessarily be relinquishing power, but rather extending their reach beyond their own profession”

~ Ann Fox & Scott Reeves, 2015 (1)

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LIST OF ABBREVIATIONS AND SYMBOLS

| Acronym | Meaning |
|-------------------|---|
| ARC-PA | Accreditation Review Commission on Education for the Physician Assistant (US) |
| CanMEDS-PA | Canadian Medical Education Directions for Specialists, Physician Assistant |
| CAPA | Canadian Association of Physician Assistants |
| CAS | Complex Adaptive Systems |
| CBME | Competency Based Medical Education |
| CCO | Cancer Care Ontario |
| CCPA | Canadian Certified Physician Assistant |
| CFPC | College of Family Physicians of Canada |
| CHA | Canada Health Act |
| CHT | Canada Health Transfer |
| CPD | Continuing Professional Development |
| CMA | Canadian Medical Association |
| CPSA | College of Physicians and Surgeons of Alberta |
| CPSM | College of Physicians and Surgeons of Manitoba |
| CPSNS | College of Physicians and Surgeons of Nova Scotia |
| CPSO | College of Physicians and Surgeons of Ontario |
| EPA | Entrustable Professional Activity |
| HCP | Healthcare Provider or Practitioner |
| HFO | HealthForceOntario |
| HiREB | Hamilton Integrated Research Ethics Board |
| HPRAC | Health Professions Regulatory Advisory Council |
| LHIN | Local Health Integration Network |
| MOC | Maintenance of Certification |
| MOHLTC | Ministry of Health and Long Term Care |
| NCCPA | National Commission on Certification of Physician Assistants (US) |
| NCP | National Competency Profile |
| NOSM | Northern Ontario School of Medicine |
| NP | Nurse Practitioner |
| OHA | Ontario Hospital Association |
| OHIP | Ontario Health Insurance Plan |
| OPAA | Ontario Physician Assistant Association |
| OSCE | Objectively Structured Clinical Evaluation |
| PA | Physician Assistant |
| PA-C | United States certified Physician Assistant |
| PACCC | Physician Assistant Certification Council of Canada |
| PAEP | Physician Assistant Education Program |
| PAIWG | Physician Assistant Integration Working Group (Ontario) |
| P4P | Pay for Performance |
| RCPSC | Royal College of Physicians and Surgeons of Canada |
| RHPA | Regulated Health Professions Act |

DECLARATION OF ACADEMIC ACHIEVEMENT

This is a sandwich thesis that consists of three original research studies (chapters 3-5), as well as an introduction (chapter 1), overview (chapter 2) and a concluding chapter (chapter 6). I am the primary author of each chapter presented in this dissertation. Each research study is the result of collaborative work between the primary researcher (KB), primary supervisor Dr. Meredith Vanstone, and committee members, Dr. Julia Abelson, Dr. Mitch Levine and Dr. Pat Miller. At the time of thesis submission, all three manuscripts have been submitted to peer-reviewed journals. The introductory chapter was written by the primary researcher at the start of this thesis-based research, and has been accepted for publication in the Canadian Healthcare Occupations textbook.

As the primary researcher (KB), I was responsible for shaping the research questions, methodology/study design, research ethics board applications/amendments, semi-structured interview guide, data collection, data analysis and manuscript writing. Co-authorship (MV, JA, ML, PM) was determined based on guidance, editing, feedback and expertise around study design, conducting the research study, discussion of findings, and manuscript contributions.

CHAPTER 1: INTRODUCTION TO PHYSICIAN ASSISTANTS IN CANADA

Chapter Preface

This introductory chapter serves as a foundation for the subsequent research chapters in this dissertation by providing the history of PA integration in Canada, current educational programs, national growth of the profession, and research evidence. In addition, this introductory chapter is currently in press for a textbook on the Canadian health workforce as reflected in the following citation:

Burrows K, Vanstone M, Jones I. (In Press) "Physician Assistants in Canada" in *Introduction to the Health Workforce in Canada*, Canadian Health Human Resources Network. Bourgeault, I.L., Editor.

I was responsible for conceptualization of the chapter contents and for conducting the scoping literature review. My supervisor (MV) contributed to the development of the textbook chapter by reviewing drafts and editing content. An additional author, Mr. Ian Jones (IJ) provided final editing of the textbook chapter. Permission to use the textbook chapter for this thesis dissertation was provided by Dr. Ivy Bourgeault, current editor of the health professions textbook.

Definition of the Physician Assistant Profession

Physician Assistants (PA) provide a broad range of medical services to support patient-centered health care. Often working autonomously under a supervising physician, they possess a defined body of knowledge and the clinical and procedural skills to collaborate effectively with physicians (1, 2). PAs complement existing services and help improve patient access to health care: interviewing patients to record their histories; conducting physical examinations; performing select diagnostic and therapeutic interventions or procedures; counseling patients on preventive health care; and performing any task within their expertise that the supervising physician may delegate (3).

The rise of PAs in Canada

Physician assistants were first trained and employed by the Canadian Forces in the 1950s as “6B Medical Assistants” with a broad range of practice that was ideal for the military context (4). In the mid-1980s they earned their new designation as Physician Assistants (4), and formally entered the public Canadian health care system in Manitoba in 1999 (5). Since then, PAs have expanded into other provinces including Ontario, Alberta and New Brunswick. PAs have been established in the United States since the mid-1960s, when physicians and educators recognized the need for improved access to health care. In addition to working within the Canadian public health care system, PAs today are also employed by private industry, providing health care to workers in remote regions. Across the country, the PA profession is supported and developed to increase patient access to medical services and to reduce wait times.

National Representation for PAs

In 1999, the Canadian Academy of PAs was established as a national professional organization to advocate for Physician Assistants. Supported by the Canadian Forces, the Academy was meant to become self-sufficient and eventually include civilian PAs (6). It went on to change its name to the Canadian Association of Physician Assistants (CAPA) to clarify its role as a professional association rather than an educational foundation (7).

In 2003, CAPA received recognition from the Canadian Medical Association (CMA) for PAs to be considered a designated health science profession within the CMA conjoint accreditation process (8). The following year, the CMA also accredited the Canadian Forces Medical Services School PA program. As part of the program's professional recognition requirements, CAPA authorized the Physician Assistants Certification Council of Canada—an independent body—to establish a national certification examination. Twenty candidates successfully completed the first national examination in 2005 (4, 9).

Physician Assistant Education in Canada

Canadian Forces PA program

The Canadian Forces launched Canada's first PA education program through its Medical Services School (now the Canadian Forces Health Services Training Centre) in 1984. The program now includes 48 weeks of didactic learning, followed by a second year of 13 supervised clinical rotations across Canada. Students are selected from Medical Technicians working within the Canadian Forces Medical Service who have a Medical Technician Qualification Level 6A, have achieved the rank of Sergeant, and have completed their Primary Leadership Qualification. Entrants typically have 12–15 years of military service, and must have completed several paramedical courses and a significant number of clinical training hours. CAF PA graduates are eligible to take the national certification exam, and those who pass are promoted to the rank of warrant officer (9). As part of an occupational restructure in April 2017, eligible CAF PAs were transitioned from a non-commissioned member occupation to an officer occupation.

The Canadian Forces has collaborated with the University of Nebraska's School of Allied Health Professions since 2009 to allow military PAs to obtain baccalaureate degrees (10). At that time, Canadian universities did not offer PA training programs and were not interested in recognizing prior military service to confer a baccalaureate, whereas the University of Nebraska already provided a similar degree program to the U.S. Air Force. In

June 2017, the Canadian Forces Health Services Group submitted a formal request to solicit interest in aligning with a Canadian PA program in order to confer the associated baccalaureate degree to CAF PA program graduates.

Civilian PA Programs

There are currently three civilian PA education programs in Canada: the McMaster University Physician Assistant Education Program, offered in Ontario; the Consortium of Physician Assistant Education, also in Ontario; and the University of Manitoba's Master of Physician Assistant Studies in Manitoba. Program development is also underway in Alberta, but no formal program has been established.

Ontario

The Ontario programs offer an intensive, two-year undergraduate degree (Physician Assistant), and require a minimum of two years of undergraduate study prior to admission into the program. The *McMaster Physician Assistant Education Program* is modelled on the university's medical school curriculum (11). The first year consists of problem-based learning tutorials, clinical skills, communication skills and longitudinal placements; the second is a 48-week clerkship (i.e., series of clinical placements) that includes core rotations in emergency medicine, internal medicine, family medicine, pediatrics, psychiatry, geriatrics, general surgery and electives. The program currently accepts 24 students per academic year, and 227 students (as of August 2019) have graduated since 2010.

The *Consortium of Physician Assistant Education* program is offered by University of Toronto, the Michener Institute for Applied Health Sciences, and the Northern Ontario School of Medicine (12). The program consists of a pre-clinical year involving in-person 'residential' blocks, longitudinal placements and online academic courses, and a second year of clinical placements in various medical rotations as well as ongoing health

promotion, evidence-based medicine and ethics courses. The program accepts 30 students per academic year.

Manitoba

The University of Manitoba's Master of Physician Assistant Studies is currently the only graduate-level PA program in Canada (13). It currently accepts 15 students per year (prior to 2017, it accepted 12 students per year), each of whom is required to hold a four-year bachelor's degree, meet the university's requirements for graduate studies, and satisfy specific prerequisites in human anatomy, human physiology and biochemistry. The first year of the program consists of didactic academic training followed by 13 months of clinical rotations covering family medicine, internal medicine, surgery, orthopedics/sports medicine, pediatrics, psychiatry, community health, emergency medicine, obstetrics/gynecology, clinical anesthesia and electives. Graduates (122 as of August 2019) are required to complete a research project (Capstone) in addition to the CanMEDS-PA curriculum.

All four Canadian PA schools educate PA students in the medical model, which mirrors undergraduate medical student training. Students face a steep learning curve and must complete their training within a two-year period, typically comprised of a clinical science year and a clerkship year (clinical rotations). Although entry requirements differ between the four programs, Canadian PA graduates have a fairly homogenous skill set and knowledge base that can be adapted to any clinical setting. In addition, each program is held to a high standard through a cyclical accreditation process for students to qualify for graduation, and eligibility to challenge the National Certification Exam.

PA Education Program Accreditation

The Canadian Medical Association first accredited the CAF PA program in 2004, and was responsible for overseeing Canadian PA program accreditation until it withdrew from health professional accreditation services in February 2018. CAPA and a PA accreditation working group continue to engage in discussions to seek a new accrediting body for PA education programs. Each PA program received 6-year accreditation status during respective 2016/2017 site visits, and the Physician Assistant Certification Council of Canada is providing accreditation oversight while a new accreditation body is formalized.

Emergence of Competency Based Medical Education

Given the parallels between PA and undergraduate medical education and nature of the PA role, the CanMEDS-PA framework also outlines PA competencies under the roles of Medical Expert, Communicator, Collaborator, Leader, Health Advocate, Scholar and Professional. In order to align with the medical education movement towards entrustable professional activities (EPAs) and competency based medical education, PA specific EPAs were developed based on a systematic review of EPAs from PA educators in the US and Netherlands, the Association of Faculties of Medicine of Canada, and the American Academy of Medical Colleges. The newly proposed Canadian PA-EPAs identify tasks within the CanMEDS-PA framework to delineate the activities required for PAs entering practice. For example, one EPA-PA criterion requires a PA to collaborate as a member of an interprofessional team, including giving or receiving a patient handover to transition care responsibility (14).

Physician Assistant Certification

The Physician Assistant Certification Council of Canada (PACCC) is responsible for administering the Canadian PA entry to practice certification exam—and do so independently of any educational facility to ensure that certified PAs meet national standards (based on the national competency profile, CanMEDS-PA) for the profession (15). Candidates must graduate from a Canadian accredited PA program, and be a member of the CAPA. US trained PAs may also challenge the Canadian exam if they have graduated from a US Accreditation Review Commission (ARC-PA) accredited program, and are certified by the National Commission on Certification of Physician Assistants (NCCPA). The National Certification Exam is currently offered once a year and consists of 250 multiple-choice questions.

To maintain CCPA status, PAs must annually renew their CAPA membership and report 40 credits of annual continuing professional development (CPD) activities, for a total of 400 credits over a 5-year cycle. CCPAs are registered as Mainport ePortfolio users with the Royal College of Physicians and Surgeons of Canada (15).

Core competencies required of PAs

In 2015, CAPA refined its national competency profile and PA scope of practice (titled CanMEDS-PA, 2015) to better detail what PAs are trained to do and the services they may provide. The PA national competency profile is based on several sources:

- The 2006 PA occupational competency profile (OCP), which was the product of an internal review of a 2001 OCP provided to the CMA by the Canadian Forces Health Services School
- The Ontario PA Competency Profile (16)
- The College of Family Physicians of Canada's four principles of family medicine (17)
- The 2005 CanMEDS framework
- The 2009 PA National Competency Profile (18)
- The 2015 CanMEDS framework (19)

CanMEDS-PA (2015) is currently the accepted standard in Canada, updated from the previous 2009 National Competency Profile. It defines core competencies generalist PAs should possess when they graduate. The competency profile describes expectations for each of the roles defined in CanMEDS, including the following:

- I. Medical expert – PAs are expected to integrate the thematic roles addressed by CanMEDS, including applying medical knowledge and clinical skills, and having a professional attitude when providing patient-centered care.
- II. Communicator – PAs must have excellent communication skills, which are essential to establish rapport and trust, formulate provisional diagnoses, deliver information, and facilitate a shared plan of care.
- III. Collaborator – PAs must work with the supervising physician to optimize patient care and contribute to the interprofessional health-care team.
- IV. Leader – PAs are actively engaged in developing sustainable practices, enhancing effectiveness and making collaborative systematic choices when allocating health-care resources. *Previously titled “Manger”*.
- V. Health Advocates – PAs advance the health and wellbeing of individual patients, communities and populations.
- VI. Scholars – PAs are committed to a lifetime of reflective learning and of the application and translation of medical knowledge.
- VII. Professional – PAs are dedicated to the health and care of others as guided by ethics and a commitment to clinical competence within their scope of practice.

The Ontario PA Competency Profile describes the competencies PAs in Ontario are expected to have and maintain, regardless of specialty or setting (16). The CanMEDS framework created by the Royal College of Physicians and Surgeons of Canada defines PA competencies and provides a comprehensive profile useful to educators, physicians, researchers, other health care professionals, public officials and the public (18). The CanMEDS 2015 framework is the 3rd edition of the CanMEDS Physician Competency Framework. Future revisions of CanMEDS-PA will likely integrate the proposed EPA-PA standards, and will ensure that PA education continues to be aligned with undergraduate and postgraduate medical training (with a focus on competency based medical education).

Physician Assistant Scope of Practice

PAs in Canada are trained as generalists, and their scope of practice is determined by the specialty knowledge and experience they gain through partnership with their supervising physician. A Practice Description or Medical Directive agreed to by the physician and PA may also help define each PA's scope of practice. The national competency profile, CanMEDS-PA, serves as an outline of PA competencies that determines required entry-to-practice skills and knowledge (16, 18). The Scope of Practice and National Competency Profile were created with support from the College of Family Physicians of Canada (CFPC) and the Royal College of Physicians and Surgeons of Canada (RCPSC).

Pros and cons of a broad scope of practice

It is beneficial for PAs to have a broad and flexible scope of practice that allows them to collaborate effectively with their supervising physician(s) to extend patient care in family health teams, private clinics, long-term care facilities, hospitals and other health care settings. Groups that oppose PAs have criticized this position by claiming safety can't be guaranteed within such a broad scope of practice (20). Others argue that from its inception the PA profession has emphasized a medical generalist approach, allowing horizontal mobility and adaptability rather than focused specialty training (21). Regardless of the debate, PAs function as physician extenders and therefore work under their

supervising physicians' scope of practice. This allows for a flexible and adaptable healthcare role that can be used to fill gaps in a variety of health care settings.

Today's scope of practice

Canadian PAs work within a variety of medical fields—family medicine, internal medicine, emergency medicine, dermatology, nephrology, orthopedic surgery, neurology, infectious diseases, and geriatrics, for example—and are trained to take patient histories, conduct physical examinations, order and interpret tests, diagnose and treat illnesses, and counsel on preventive health care. They may also develop other additional specialized skills while working with a supervising physician.

Demographic Profile of Physician Assistants

Data collection challenges

Due to the lack of a compulsory national registry, there is currently no comprehensive demographic information available on PAs. The information that is available has been collected voluntarily from CAPA members but may not include all PAs working in Canada. The Physician Assistant Certification Council of Canada (PACCC) lists 884 Canadian-Certified PAs (22) as of August 2019, but CAPA membership lists 639 PAs (i.e., doesn't include student members). A significant number of PAs are not captured in CAPA-collected demographic information. In addition, US certified PAs are eligible to work in Canada under their designated certification, PA-C. PAs are also employed through various ministerial initiatives in Alberta and British Columbia, with regulation and certification requirements still under consideration (2, 23). Data collection is further impeded by diverse practice settings—i.e., public and private—and provincial variations in the management of PAs.

Current data: A recent snapshot

The information presented in this section is based on publicly available information collected voluntarily from CAPA members; it may not represent every practicing Canadian PA. Table 4 summarizes the geographical distribution of PAs across Canada.

PAs across Canada

There are approximately 750 PAs currently working across Canada, primarily in Manitoba and Ontario, but PAs are gradually being introduced in other provinces. Evaluation of the impact of PAs on access, wait times, quality of care, patient satisfaction and provider satisfaction is ongoing. Currently, there are approximately 160 students enrolled in Canadian PA programs, a number that is expected to grow as the profession advances and more academic institutions offer Physician Assistant Education programs.

Profiles of PAs in Canada

A recent CAPA National Survey in 2019 showed that PAs are working in a variety of settings, with most PAs employed in family practice (25%), hospital based medicine (18%), emergency medicine or urgent care (14%), hospital based surgical settings (14%), community based medical specialty (11%), the Canadian Armed Forces (11%), and smaller scattered employment in community clinics, group practices, solo practices, industry and PA education programs (25). This is a slight shift from 2012 where most PAs were employed in military settings (46%), community hospitals (35%), academic centers (13%), community clinics (8.5%), industry (4.5%), private offices (2%) and long-term care centers (1%) (24). Salaries vary by province, ranging from \$70,000 to \$130,000 per year depending on experience and practice setting. As reported in the 2019 CAPA Census, the age distribution of 565 PA respondents is as follows: 21-30 (36%); 31-40 (32%); 41-50 (16%); 51-60 (14%); and over 60+ (3%) (25). The gender distribution is currently a 60/40 split of females to males respectively.

Physician Assistant Professional Regulation and Provincial Variation

Canada's provincial governments and provincial medical colleges determine which health practices are regulated or unregulated. Currently, only Manitoba and New Brunswick regulate PAs.

Manitoba first introduced PAs as Clinical Assistants through the *Medical Act* in 1999. In 2009, the province amended the *Clinical Assistants and Physician Assistants Regulation* under the *Medical Act, 1999* to permit practice under the title of Physician Assistant (26). Physicians can “authorize” physician assistants to perform certain duties based on the supervised individual's level of training, competencies and experience. In New Brunswick, the College of Physicians and Surgeons of New Brunswick (CPSNB) amended the *New Brunswick Medical Act, 1981* in 2009 to include PAs (27, 28).

In Alberta, PAs are currently registered with the College of Physicians and Surgeons of Alberta (CPSA). The *Health Professions Act* was altered to include both “Physician Assistant” and “PA” under the list of regulated members of the CPSA (29). The Act further outlines what PAs can do in their practice under physician supervision, which includes assessing patients to providing restricted activities authorized by regulation (30). Alberta is reported to have a regulated framework that is pending formal government review and approval.

In Nova Scotia, PAs are still known as Clinical Assistants and are not regulated through legislation. The College of Physicians and Surgeons of Nova Scotia offers an accredited program (as of January 2011), which replaces its Clinical Associate program. Recent policy on the registration of Clinical Assistants aims to ensure uniform qualification standards, minimum competency levels, accountability standards, etc. (31)

Ontario PAs, in collaboration with CAPA, applied to the Health Professions Regulatory Advisory Council for self-regulation status in 2012; however, the Council recommended

that Ontario PAs not be regulated at this time and instead advised that a compulsory registry be designed and administered by the College of Physicians and Surgeons of Ontario (CPSO) (32, 33). Unfortunately a registry was not created despite the recommendation, which continues to complicate the PA landscape in Ontario. The Minister of Health and Long Term Care (MOHLTC) established a PA Integration Working Group (PAIWG) in early 2017 to support the MOHLTC and Health Workforce Planning Advisory table to develop and implement initiatives to improve the integration of PAs into Ontario's health workforce. In September 2017, the Minister of Health requested that the CPSO work with the ministry to develop an approach to provide appropriate regulatory oversight for PAs. CAPA has endorsed this move towards regulatory oversight, but additional consideration must be given to how regulation would look under the CPSO and who will bear the cost. Additional information specific to the Ontario healthcare system is presented in Chapter 2.

Other Canadian provinces currently do not have formal regulation or registration programs for Physician Assistants at present.

Protected and Controlled Acts for Physician Assistants

PAs in Manitoba may perform reserved acts by way of the 'Delegation of a Reserved Act' provisions under the *Regulated Health Professions Act, 2009* (26). These reserved acts may only be performed in accordance with regulations—made by the council of the delegating member's college—respecting the delegation of that reserved act made by the council of the delegating member's college. Similarly, Ontario and Alberta permit an unregulated PA to perform controlled/restricted acts by delegation or supervision, respectively (29). Table 5 summarizes the best available evidence as of August 2019 on provincial regulation.

Physician Assistant Funding and Coverage of Health Professional Services

Demonstration projects funding model

Sources of funding for PAs vary across the country and continue to be in a state of flux. Some provinces, such as Ontario and Alberta, conducted pilot funding and demonstration projects through, respectively, the Ministry of Health and Long-Term Care (Ontario) and Alberta Health (Alberta). These funding models allowed stakeholders time to evaluate PA efficacy and value with the hope that support can be secured and the role can be self-sustaining (i.e., that the PA salary will be paid for by physicians, hospital funding, etc.). For example, a family physician could roster more patients to increase revenue and offset the cost of hiring a PA, while improving community access to care.

Funding models in hospitals

Hospital models are more complex, as PA salaries can be part of the overall hospital budget, be covered by physicians, or be a hybrid mix of both. Although employers may be pleased with their PAs' performance, there are questions about whether PAs provide the best value for organizational funds (34). Many PA positions were terminated when time-limited grants from the Ontario Ministry of Health and Long-Term Care ceased. Ontario's remuneration model privileges the activities of physicians, but makes it challenging for PAs to demonstrate their financial value to employers. This, in turn, makes it difficult for employers to commit to hiring PAs (35).

Manitoba's funding model

Manitoba Health, Seniors and Active Living is responsible for health services and allocates program funds to the Regional Health Authorities for PA salaries. Positions are assigned to programs or specialties services such as Cardiac Sciences, Neurosurgery, a hospital's emergency department, or rural hospital. Since 2014, fee-for-service physicians have piloted practice models where the PA is a salaried employee of the Regional Health Authority with performance measures required from the Physician group where they

work. This hybrid practice allows PAs to work in fee-for-service practices with the expectation of improved service delivery (e.g., increased patient access, decreased emergency room visits, decreased wait times). Physicians cannot bill for services performed by PAs unless the physician is directly involved. The Manitoba Medical Act allows PAs to work remotely with offsite physician supervision. The structure for PA funding is under review in Manitoba. In the summer of 2014, Manitoba Physician and Clinical Assistants organized into a collective bargaining unit (36).

PA salaries across the provinces

PA salaries across country range from \$70,000 to \$130,000 per year depending on position, responsibilities and experience. In Ontario, the Ministry of Health and Long-Term Care set the base salary for the first graduating class of PAs (2010) at a minimum of \$75,000 per year; Alberta salaries range from \$78,000 to \$99,500 per year; and Manitoba salaries range from \$81,000 to \$118,000 per year over six steps for a 40-hour straight-day schedule (36). Salaries may vary depending on on-call requirements and various overtime reimbursement models.

Cost effectiveness of PAs

Four years after PAs were introduced to the Canadian health care system, an economic analysis concluded there was not sufficient existing literature to evaluate the costs or effectiveness of PAs in Canada (37). Evaluating this cost effectiveness is difficult partly because of the ways PA deployments vary, and partly due to the lack of consensus around comparator groups — e.g., should a PA be compared to a single physician, or to a physician and a nurse practitioner, etc.? (37)

Further, most existing literature on PAs is produced in the U.S. due to the relative infancy of the profession in Canada, which is not always a comparable health care model; does not employ PAs the same way Canada does; and often does not control for important patient confounders, patient volumes, or access to ancillary services (37, 38). Some data,

however, is available on the economic effectiveness of PAs working in very particular health-care contexts, such as individual surgery practices (39).

The Conference Board of Canada released a series of reports outlining the role of PAs in the Canadian healthcare system, including the value of PAs, gaining efficiency and economic models. The reports concluded that PAs can impact health systems by reducing resident and physician workload (thus saving physician time), by increasing health care productivity, and through cost effective savings. The report outlines how the introduction of a PA to specific settings, such as primary care, emergency medicine and orthopedics, can generate health care system cost savings by efficiently substituting for designated medical tasks (40).

Conclusion

PAs have been deployed across Canada's provinces with varying strategies—and varying degrees of success. Provincial regulation and funding models are central to success: in Manitoba, for example, provincial regulation and stable funding models has helped the PA role flourish, whereas lack of funding and regulation in Ontario is cited as a large barrier to wider acceptance of PAs in that province. The diverse range of PA roles and practice areas also makes it challenging to generate evidence regarding safety, efficacy and cost-effectiveness of PAs that is generalizable.

Part of CAPA's mandate as a professional association is to expand the PA profession, and the association is actively engaged in discussions at many levels across Canada to fulfill this mandate. The PA profession has already demonstrated its value in the U.S., and with appropriate provincial legislative and financial support, PAs will continue to become an integral part of patient care within the Canadian health care system.

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Table 1: Timeline of the Development of PAs in Canada (1)

| Year | Event |
|------|--|
| 1984 | Canadian Forces expands the capability of the medical assistant, paving the way for the development of the PA model |
| 1990 | Due to limited resources within the military, the idea of the PA is given further credence |
| 1999 | The <i>Manitoba Medical Act</i> regulates clinical assistants, including PAs, as Certified Clinical Assistants |
| 1999 | The Canadian Academy of Physician Assistants (now the Canadian Association of Physician Assistants) is chartered |
| 2003 | The CMA recognizes PAs as healthcare professionals |
| 2003 | The first formally recognized civilian PA starts working in Manitoba (Cardiac Sciences and then Plastic Surgery in 2004) |
| 2007 | The HealthForceOntario project is implemented; among its goals is staffing emergency departments and clinics with PAs and international medical graduates working as PAs |
| 2009 | PAs are introduced in New Brunswick |
| 2009 | The National Competency Profile & PA Scope of Practice are revised based on CanMEDS |
| 2010 | Alberta becomes the fourth province to recognize PAs |
| 2010 | HealthForceOntario launches the inaugural career start grant program to support employers interested in Ontario PA program graduates |
| 2012 | The Health Professions Regulatory Advisory Council (HPRAC) submits its report to the Minister of Health and Long-term Care on whether the PA profession in Ontario should be regulated under the <i>Regulated Health Professions Act</i> |
| 2013 | The PA demonstration project begins in Alberta |
| 2017 | Ontario Minister of Health and Long-term Care approaches the CPSO regarding regulatory oversight of PAs |

Note: Refer to Table 2 for a timeline of PA education in Canada.

Table 2: Evolution of PA Education in Canada

| Year | Event |
|-------------|---|
| 2004 | The Canadian Forces Health Services Training Centre’s PA program is accredited by the CMA Conjoint Accreditation Process |
| 2004 | The Canadian Forces Health Services Training Centre graduates first class of 16 graduates |
| 2005 | First National Certification Exam |
| 2008 | University of Manitoba launches the Masters in Physician Assistant Studies |
| 2008 | McMaster University launches the Physician Assistant Education Program |
| 2009 | The National Competency Profile & PA Scope of Practice is revised based on CanMEDS |
| 2009 | The Canadian Forces Health Services Training Centre graduates its first PAs with bachelor’s degrees through the University of Nebraska’s School of Allied Health Professions |
| 2010 | The Consortium for PA Education (the University of Toronto, the Michener Institute for Applied Health Sciences, and the Northern Ontario School of Medicine) trains its first class |
| 2010 | McMaster University and the University of Manitoba graduate their first classes |
| 2012 | University of Toronto’s Consortium of PA Education graduates its first class |
| 2015 | CAPA Scope of Practice & National Competency Profile was updated to CanMEDS-PA (2015 edition) to reflect changes in CanMEDS 2015 |
| 2016 | Canadian Medical Association announces the disbandment of its health professional education accreditation services. The search for a new accrediting body begins. |
| 2017 | The Physician Assistant Certification Council of Canada (PACCC) offers accreditation oversight until a formal agreement is in place with a new accrediting body. |

Table 3: Summary of Canadian Physician Assistant Education Programs

| Program Details | McMaster University, Hamilton, ON | University of Toronto, Toronto, ON | University of Manitoba, Winnipeg, MB | Canadian Forces Health Services Training Centre, Borden, ON |
|-------------------------------|---|---|---|---|
| Program Type | Civilian | Civilian | Civilian | Military |
| Program Title | McMaster University PA Education Program | The Consortium of PA Education (University of Toronto’s Faculty of Medicine, the Michener Institute for Applied Health Sciences, and the Northern Ontario School of Medicine) | University of Manitoba Master of PA Studies | The Canadian Forces Physician Assistant Program |
| Degree Conferred | Bachelor of Health Sciences, Physician Assistant | Bachelor of Science, Physician Assistant | Master of Physician Assistant Studies | Bachelor of Science, Physician Assistant* |
| CMA/CAPA Accreditation | 1 st accredited in 2010. Most recent accreditation (6 year status) in 2016 | 1 st accredited in 2012. Most recent accreditation (6 year status) in 2017 | 1 st accredited in 2010. Most recent accreditation (6 year status) in 2016 | 1 st accredited in 2004. Most recent accreditation (6 year status) in 2016 |

*Degree conferred by the University of Nebraska’s School of Allied Health Professions PA Program (10).

Table 4: CAPA Membership, 2019

| Province | Total |
|---------------------------|--------------|
| Alberta | 41 |
| British Columbia | 20 |
| Manitoba | 95 |
| New Brunswick | 8 |
| Newfoundland and Labrador | 2 |
| Nova Scotia | 30 |
| Northwest Territories | Unknown |
| Ontario | 419 |
| Prince Edward Island | 1 |
| Quebec | 21 |
| Saskatchewan | 2 |
| Total | 639 |

**Note: this membership does not include student members, retired PAs or International members (25).*

**Table 5: Summary of Provincial Variability of PA Regulation and Legislation
(as of July 2019)**

| Province/Territory | Registration | Regulation |
|---------------------------|--|---|
| British Columbia | N/A <i>*Note: Province commissioned a report on the potential of Nurse Practitioners and PAs in BC (41); no publicly available policy has been released</i> | N/A |
| Alberta | College of Physicians and Surgeons of Alberta | PAs listed under Schedule 21 of the <i>Health Professions Act</i> . Regulatory framework awaiting formal government approval (30). |
| Saskatchewan | N/A | N/A |
| Manitoba | College of Physicians and Surgeons of Manitoba | Regulated since 1999 as Clinical Assistants. PA title adopted in 2009 (26). |
| Ontario | Recommended voluntary registry through College of Physicians and Surgeons of Ontario, not yet enacted | Application for regulation denied by Health Professions Regulatory Advisory Council in 2012. Minister of Health requests that the CPSO address PA regulation (2017/2018). |
| Quebec | N/A | N/A |
| New Brunswick | College of Physicians and Surgeons of New Brunswick | Regulated under section 32.1 of the <i>Medical Act</i> (27). |
| Nova Scotia | N/A | N/A |
| Prince Edward Island | N/A | N/A |
| Newfoundland and Labrador | N/A | N/A |
| Nunavut | N/A | N/A |
| Northwest Territories | N/A | N/A |
| Yukon Territory | N/A | N/A |

CHAPTER 2: THE ONTARIO HEALTH CARE SYSTEM AND STUDY CONCEPTUALIZATION

Chapter Preface

Building on the historical overview of the PA profession in Canada presented in Chapter 1, this chapter introduces the original research that constitutes this doctoral dissertation. An overview of the Ontario healthcare system is presented to provide context behind the introduction of PAs in this province. This background provides the foundation for addressing the research gaps around health professional role implementation and integration as it pertains to the PA profession. The overarching objectives of this dissertation are then presented, followed by a summary of the methodological approach used in the original research chapters. Finally, the chapter concludes with a brief discussion regarding reflexivity and trustworthiness.

Overview of the Ontario Healthcare System

There is a lack of conceptual clarity regarding the integration of PA roles within health systems, resulting in confusion about a number of factors essential to health human resource planning, including regulation, funding, and contributions to patient care. This lack of understanding is complicated by significant variability in how PAs are integrated into the health care system, both within and across countries. As outlined in Chapter 1, the variability of the PA role across Canada is reflected in a mix of centralized and distributed funding, differences in health professional regulatory legislation, and significant disparity of PA uptake across provinces and territories. However, the experience of PAs in Ontario is also bound and influenced by other factors, which requires an understanding of the history and legislation that form the foundation of our health system.

Canada Health Act

The Canada Health Act (CHA) was enacted in 1984 and outlines the criteria and conditions that each province and territory must follow in order to receive their full federal funds under the Canada Health Transfer (CHT) (1). Each Canadian province is responsible for independently determining how to best provide for the healthcare needs of citizens in their respective region. The primary objective of Canadian health care policy, as described in the Canada Health Act, is to *“protect, promote and restore the physical and mental well-being of residents of Canada and to facilitate reasonable access to health services without financial or other barriers”*. The CHA is based on five conditions: universality, comprehensiveness, accessibility, portability of coverage between provinces, and public administration. By defining “comprehensiveness” as coverage of only hospital and physician services, the CHA reinforces hospital- and physician-centered health care that then limits other potential health human resource innovations (2).

The Ontario Healthcare System

In addition to Canada Health Transfer funding from the federal government, the Ontario government also channels a significant amount of collected taxes into the health care system, through the Ministry of Health and Long Term Care (MOHLTC). The role of the MOHLTC is to create the legislative landscape for the healthcare system to operate across a number of agencies, including the Ontario Health Insurance Plan (OHIP), regional health authorities (previously Local Health Integration Networks or LHINS) and various administrative and information management services responsible for governance, financing and delivery arrangements.

Governance Arrangements

The Ontario government has developed a highly complex structure to determine who can make what types of decisions pertaining to health care. Governance arrangements for decision-making involve a wide range of actors, from organizational and professional authorities to consumer stakeholders (3). It is important to note that the Ontario government has retained policy authority in some areas, and decentralized their authority in other areas. For example, the government decides who is covered for the Ontario Drug Benefit Program, but has decentralized policy making around health professional regulation to the respective regulatory colleges (i.e., College of Midwives of Ontario, College of Physicians and Surgeons of Ontario). This poses a challenge for new health professions, such as PAs, who currently lack a regulatory college despite directly being introduced to the system by the government. The distribution of governance also complicates a clear designation of who is responsible for creating policy and collecting evidence regarding role implementation and integration. In addition, the decentralization of authority to a variety of agencies (i.e., HealthForceOntario, LHIN's or Cancer Care Ontario) further confounds PA role integration as various agencies and actors have different interests and investments in the PA profession.

Financing

Government spending on healthcare in Ontario is mostly financed through taxes, with the largest portion of public revenues allocated to the LHINs (to pay for hospitals, home and community care agencies, etc.), and to OHIP (to pay for physician services) (4). Through OHIP, the Province pays for many health services, including physician visits, hospital visits and stays, ambulance services, and travel for northern-Ontario residents (5). Within the OHIP model, physicians are most commonly remunerated as independent contractors. For most, this means they are not employees of a health organization, and bill OHIP directly for their services rather than billing the organization through which they provide services. However, over the past few years, new funding models, such as family health team (FHT) funding, has provided an alternative to traditional fee-for-service remuneration models in which a small group of family physicians are primarily compensated through fee-for-service but also eligible for bonuses and premiums based on patient enrolment.

Remuneration of health professionals is periodically adjusted to align with health-system priorities, such as interprofessional team-based primary care, and global hospital budgets may receive additional bonus funding for meeting quality outcomes, such as decreased wait times. Most physicians are paid a set fee for the services they provide, and other non-physician health professionals are typically salaried. Generally, the flow of health care financing can be summarized through five categories: system financing (raising revenue), funding organizations, remunerating providers, purchasing services and products, and incentivising consumers (4). Although this flow provides an understanding of how tax revenue supports health care provider salaries, the multiple layers complicate funding models. Non-physician providers like PAs are often caught in a middle ground, where global budgets don't allocate funding towards their salaries, and Physician employers may or may not be willing to cover their salaries out of OHIP billings.

Delivery arrangements (infrastructure and workforce)

One key feature of delivery arrangements in the Ontario health care system is the balance between the supply (e.g., number) and distribution (e.g., location) of health professionals to meet the needs of a complex system (6). Rural and marginalized populations are even more challenging, given the additional barriers to care experienced by these populations. The recent transition to needs-based workforce planning by the MOHLTC has shifted the focus from physicians to interprofessional, team based care (6). The introduction of PAs in 2006 was just one of many health workforce initiatives taken by the government to improve access to care and to decrease wait times for patients in Ontario (7).

Introduction of the PA Profession in Ontario

Health Force Ontario (HFO), a collaborative initiative of the Ontario Ministry of Health and Long-Term Care (MOHLTC) and the Ministry of Training, Colleges, and Universities Physician Assistants, was launched in May 2006. The goal of the HFO strategy was to ensure that Ontarians have access to the right number and mix of qualified health care providers, which was consistent with then-Premier Dalton McGuinty's proposed plan for health care innovation (8). The HFO mandate was to address Ontario's health human resource needs by engaging partners in education and health, the development of skilled and knowledgeable providers, and the introduction of new and expanded provider roles (9). Part of this new health human resource strategy included the introduction of PAs through various demonstration projects, and the initiation of PA education programs in Ontario (8, 10).

Funding & Salaries for PAs in Ontario

While the initial demonstration/pilot projects ended in 2009, the MOHLTC continued to provide funding for PAs to employers through HFO until the funding was terminated in 2015. Currently, short-term provincial funding for PAs is provided by HFO in the form of “career start grants” to support the graduates from the Ontario civilian PA education programs, McMaster University and the Consortium of PA Education (University of Toronto, Northern Ontario School of Medicine and the Michener Institute). This time limited financial support is meant to facilitate the transition of PA graduates to help address patient care needs, and to match graduates with employers committed to long term integration of the PA role within their organization (11). The career start grants provide funding support of \$46,000 for one year, with matching funds expected to come from the employer (physician, hospital or health organization). Each year, priority settings for PA employment are identified. Previously, these have included emergency medicine, primary care, general internal medicine, and other clinical settings.

The only permanent funding for PA salaries is provided via FHT “allied health” funding. This designated funding allows FHTs to employ additional health care providers of their choice, and could include a nurse, dietitian, pharmacist, PA, or other healthcare providers. PAs employed in all other settings are funded through a variety of sources, including physician reimbursement, practice plans, global hospital budgets, or pay for performance (P4P) incentives, among others. Pay for performance incentives are financial rewards allocated to hospitals or physicians who meet certain organizational targets, such as decreasing emergency room wait times or increasing access to preventative services in primary care (12, 13).

PA salaries across the province range from \$70,000 to \$130,000 annually depending on position, responsibilities and experience. In Ontario, the Ministry of Health and Long-Term Care set the base salary for the first graduating class of Ontario civilian PAs at a minimum of \$75,000 per year, which has remained unchanged since it was introduced in 2010. The

Ontario *Public Sector Salary Disclosure Act* (the “sunshine list”) provides information on all public sector employees who were paid \$100,000 or more and is reported on an annual basis. The most recent year of reporting, 2018, the highest PA salary available on the list was \$120,265; there were 28 PAs listed on the sunshine list with an average salary of \$102,499. However, this annually reported list only captures 31 of the over 500 PAs currently practicing in Ontario, and does not include the salaries of PAs who are directly employed by a physician or community based practice.

Health Professional Regulation

As outlined in Chapter 1, PAs in Ontario applied to the Health Professions Regulatory Advisory Council for self-regulation status in 2012. At the time, the Council recommended that Ontario PAs not be regulated and instead advised that a compulsory registry be designed and administered by the College of Physicians and Surgeons of Ontario (CPSO) (14, 15). The Minister of Health and Long Term Care (MOHLTC) re-established a PA Integration Working Group (PAIWG) in early 2017 to develop initiatives to improve the integration of PAs in Ontario’s health workforce. In September 2017, the Minister of Health requested that the CPSO work with the Ministry to develop an approach to provide appropriate regulatory oversight for PAs. A change from a majority Liberal government to Conservative government in 2018 led to the disbandment of the PAIWG, although the current Minister of Health has been willing to meet with CAPA to discuss regulation and other professional barriers.

Study Aim and Rationale

The aim of this thesis is to explore PA role integration in the Ontario healthcare system through an in-depth analysis of setting and role descriptions, described outcomes, and healthcare provider perceptions. Three interconnected studies were developed with the following objectives:

1. To explore the facilitators and barriers that influence Physician Assistant (PA) role optimization and success in Ontario family medicine (primary care) settings; (Chapter 3)
2. To explore how PAs in Ontario surgical settings define their role, how their role is perceived by other health professionals, and to examine their contributions in surgical settings; (Chapter 4)
3. To explore PA role integration in the Ontario healthcare system across four employment settings, including family medicine, general surgery, emergency departments and in-patient settings; (Chapter 5).

Within primary care settings, there is a lack of Canadian literature around the role of PAs in family medicine settings. Research evidence from other jurisdictions, such as the United States, where PAs have a longer history, demonstrates the safety, effectiveness, patient satisfaction, and contribution of PAs to primary care settings (16-19). Canadian literature is even more sparse, and only one study focuses on PA role implementation in primary care and family medicine sites in Manitoba (20), where PAs are regulated and funding is centralized. A 2013 qualitative study in Ontario did identify a number of benefits and barriers to PA employment, but the data was solely sourced from physicians and was not specific to family medicine settings (21). In chapter 3, we aim to build upon these studies, exploring how the PA role was optimized within family medicine settings by identifying barriers and facilitators to role integration. By examining family medicine settings where the PA role has been successful, increased awareness of facilitators and barriers to PA role

optimization will help identify where provincial stakeholders can continue to build on the investments already made in the PA profession, and where family physicians/employers can strengthen PA integration within their own clinics.

As background to the second objective, PAs are a new addition to the Canadian interprofessional team, and little research exists to describe their role and contributions to surgical settings. As a generalist health care provider, PAs have a long history in surgical settings in the United States and have been formally integrated into surgical settings in Manitoba (22-24). One systematic review of international literature found that the addition of a PA or NP onto adult surgical and trauma service teams is safe and cost-effective, based on an examination of factors including length of stay, morbidity, mortality, effect on resident satisfaction, and cost savings (25). Evidence from one Ontario site indicates that the introduction of PAs increased patient satisfaction, improved patient flow, and improved resident satisfaction (26). In light of this limited knowledge, we aim to explore how PAs in surgical settings define their role, how their role is perceived by other health professionals, and to examine their contributions in surgical settings.

Finally, turning to the third objective, the use of PAs continues to expand across many international settings, reflecting a trend towards using interprofessional collaboration to respond to workplace challenges such as physician shortages, pressure to increase health care efficiencies, resident work-hour restrictions, and increasingly complex patient handoffs (26-30). Additionally, the members of the PA profession can help address inherent tensions between service demands, training requirements and budgetary restraints, workforce shortages, and to improve patient experiences (31-34). However, the PA experience is often left out of these studies, and there are few opportunities to compare similarities and differences experienced by PAs and employers across a variety of settings. By exploring the role of PAs across family medicine, emergency medicine, general surgery and inpatient medicine settings, we hope to fill the knowledge gaps by addressing how and why PA integration is impacting community and hospital care in Ontario.

Approaches taken in the three studies

The identified research gaps are addressed in this dissertation through three case studies, which collectively provide a rich, exploratory description of the PA role in family medicine (chapter 3), general surgery settings (chapter 4), and a cross-case narrative (chapter 5). Compared to other research on the PA profession, this dissertation is unique in that it provides practicing PAs an opportunity to share their experiences, including the context of physician and other health care provider perceptions, across a variety of employment settings (hospital, family practice settings and emergency departments).

Key Definitions

This dissertation uses a number of key terms including role, role optimization, role integration, healthcare teams, and success. A role is recognized as a relational concept that is task oriented towards work performance and usually defined in terms of other positions within an organization (35). The roles of healthcare professionals, such as PAs, are dynamic and revised in response to contextual pressures such as policies, funding, patient preferences, or regulation (35, 36). A table is provided at the end of this chapter to provide a summary of definitions and citations for key terms prevalent in the subsequent chapters (Table 1).

Methodological Approach

A case study approach was selected for this dissertation research as the design met three conditions: the research focuses on “how” or “why” questions related to the PA integration, the study sought to explore the issues within contemporary events, and the researcher(s) have little or no control over the phenomenon of interest (37, 38). A case study is defined as an intensive study about a person, group of people or setting of interest, which is aimed to generalize findings across several settings (39, 40). This methodological approach involves the in-depth exploration using multiple forms of data collection to systematically gather information on how a system functions (41). The multiple case study approach enables the researcher to explore variation and diversity

both within and between the cases of interest (40, 42). The researcher aims to replicate findings across cases, and the cases must therefore be carefully chosen so that similarities and outliers can be identified (37, 41). Alternatively, a single case study allows the researcher to develop a deeper understanding of the phenomenon of interest and to delve into exploring new theoretical relationships (39).

This thesis incorporates a mix of single- and multiple-case study approaches to address the research aim and subsequent study objectives. Both the single and multiple-case approaches involved embedded subunits of analysis, reflecting the choice to involve more than one site or unit of analysis. This multiplicity of evidence is investigated at least partly in subunits, which helps the researcher focus on different salient aspects of the case of interest (43). Chapter 3 and chapter 4 are designed as separate embedded single-case studies in order to explore role definitions, role contributions, and the barriers and facilitators that impact role integration in family medicine and general surgery settings. These sites were each selected as they represent a common primary care setting (family medicine), and a more complex hospital setting (general surgery). Insights gained from the in-depth case studies of family medicine and surgical settings helped inform the broader multiple case study and the role of PAs as just one of many agents in our complex healthcare system.

For the purpose of this thesis dissertation and subsequent manuscript submissions, chapter 3 and chapter 4 are presented as single, exploratory case studies with embedded subunits of analysis (the various clinical sites that comprised the family medicine or general surgery “case”) but also constitute two of the four “cases” selected for the broader cross-case analysis (chapter 5). A detailed summary of how the three chapters interconnect is presented in Figure 1.

Phenomenon of Interest

The phenomenon of interest in the multiple case studies presented in this dissertation is how PAs have been integrated into various healthcare settings in Ontario, and why they were integrated. Case study methodology allows for an in-depth and detailed description of PA integration by allowing for a rich description within the context of real-life sites and settings, and the lived experiences of study participants.

Defining Context

Case study methodology is also useful when the boundaries are not clear between the phenomenon of interest (i.e., PA integration) and context (i.e., introduction of new health professional roles into the Ontario healthcare system given current economic, government, cultural and health systems climate) (42). Given that PAs were introduced as unregulated healthcare professionals to a diverse number of healthcare settings in Ontario, it would be very challenging to research the role without considering the context of why or how this occurred. The diversity of healthcare settings means that in-depth descriptions of each of the case(s) of interest must be studied so that the context of each situation or setting is understood (42, 44).

Case Boundaries

One of the most challenging aspects of case study research is designing the study boundaries to determine what is to be studied in the scope of the research (42). The case(s) of interest were focused at the individual level, specifically aimed at PAs and other health professionals in the same settings, however organizational and systems context was also explored through the document analysis. For the purpose of this dissertation, the following boundaries were applied to the case(s) of interest:

- *Case 1, Family Medicine:* This case was bounded by sites or settings that employed the same PA for at least two years in a full time position, employed a minimum of one supervising physician, and where the clinical setting was community based bounded geographically by the Province of Ontario.

- *Case 2, General Surgery:* This case was bounded by in-patient hospital settings that employed the same PA for at least two years in a full time position who works with a minimum of one surgeon, and where the hospital setting was geographically bounded by the Province of Ontario.
- *Case 3, Emergency Medicine:* This case was bounded by hospital-based Emergency Departments that employed the same PA for at least two years in a full time position, supervised by a minimum of one Emergency Physician, and where the hospital setting was geographically bounded by the Province of Ontario.
- *Case 4, Inpatient Medicine:* This case was bounded by Ontario based, in-patient hospital settings including internal medicine and cardiac intensive care units. The PA and supervising physician must have worked together for a minimum of two years in the inpatient setting.

An exploratory approach is useful in situations in which the intervention being evaluated has an unknown or unclear set of outcomes (37). The exploratory approach was particularly relevant for PA integration research given the lack of existing knowledge or detailed preliminary research. In addition, this approach allows the researcher to have a high degree of flexibility regarding the research design and data collection (41). Additionally, the multiple-case study approach allows the researcher to explore similarities and differences within and between cases, ultimately aiming for replication of findings across cases (37, 42). Given the lack of existing knowledge regarding PA integration in Ontario, the exploratory multiple-case study approach was especially relevant for this emerging topic. In addition, the exploratory case study method lends itself well to my pragmatic approach, by grounding individual participant and setting experiences within a practical assessment of PA integration.

Sensitizing Concepts

There were three main sensitizing concepts used to frame the outcomes and factors of interest in this dissertation:

- What models of supervising facilitate successful integration?
- What features of the organizational or clinical context mediate successful integration?
- What is the impact of PA specific factors (personality, previous experience, education, communication skills, clinical skills) on successful role integration?

Practical gaps addressed by the dissertation

A rich understanding of the roles of PAs in the Canadian health care systems has been elusive. This dissertation provides a practical understanding of the roles of PAs in the Ontario health care system through the evidence that emerged from the individual and multiple-case studies. In addition, this research includes interviews with PAs, whose perspectives have historically been neglected. Chapter 3 presents qualitative case study evidence relating to the role of PAs working in family medicine, and provides an overview of the professional, practice-based and policy factors that influence role success. The evidence from the general surgery setting in chapter 4 incorporates collaborative and interprofessional findings that help define the role of PAs in hospital based settings. Finally, the multiple-case study presented in chapter 5, provides a rich qualitative analysis of “why” and “how” PAs have been integrated within Ontario, and outlines the factors that contribute to role optimization or failure in complex health care systems.

Trustworthiness

Strategies for Achieving Trustworthiness in Case Study Research

Trustworthiness in qualitative research relates to four criteria, including credibility, transferability, dependability and confirmability (45). In addition to this broad criterion, case study design parameters also aim to support the reliability and validity of research findings (37).

Assessing the reliability of study findings requires researchers to make judgments about the ‘soundness’ of the research in relation to the chosen methodology and integrity of the results (46). The design and strict adherence to a case study protocol helped support reliability through the inclusion of case selection criteria, interview guides for each member of the healthcare team, and a database of collected documents (35). A database summary of sample documents is provided in Appendix I.

The confidence of the qualitative researcher in the truth of the study’s findings directly relates to credibility (45). Similarly, validity is defined as how accurately the researcher represented the participants’ realities of the social phenomenon of interest (47). Validity and credibility were reinforced through the triangulation of multiple sources of evidence (health organization websites, medical directives, news or media articles, and government documents), establishing a clear chain of evidence, and using multiple researchers for coding and to address emerging themes and rival explanations (i.e., outliers or negative cases). Additionally, member checking was used in Chapter 3 to eliminate researcher bias when analyzing and interpreting the results that emerged from the interview transcripts (48). Pattern matching, explanation building and replication logic were also used in Chapter 5 to establish overarching associations across each of the four cases (37).

Transferability reflects the degree to which the results can be transferred to other settings or contexts (45), and by answering how applicable are the findings to other settings. Descriptive explanation building was used as a strategy to maximize transferability,

ensuring that the participant experiences and context are meaningful to outsiders less familiar with the research or setting (49).

Dependability reflects the importance of maintaining an accurate and consistent process for analysis over time (49). In order to achieve dependability in this research dissertation, the chain of evidence was transparently reported through an audit trail describing the research steps taken from the study conceptualization to completion.

Finally, confirmability or neutrality is achieved when truth value (validity) and transferability (applicability) have been addressed (46). Confirmability is the degree to which the research findings can be confirmed by other researchers, and the assurance that the study findings are clearly derived from the data (49). Like dependability, an audit trail created from the chain of evidence was used to ensure confirmability criteria were met. In addition, the researchers' philosophical position, experiences and perspectives are further described in the section below on reflexivity.

Researcher Reflexivity

As a researcher, it is important to clearly identify my interest in conducting this research in order to provide the context around the conceptualization of this study. Reflexive research is characterized by ongoing self-appraisal and self-critique, and that the research product can be characterized by the politics of location and researcher positioning (50). Reflexivity, as a component of quality criteria for qualitative research, was achieved through a number of strategies, including reflecting on my own conceptual lens, assumptions, preconceptions and how each of these influenced my research decisions (49).

Personal (introspective) reflexivity

Over my two years of training as a PA in the McMaster Physician Assistant Education Program, I experienced first-hand many of the challenges of pioneering a new health profession. From employer misconception to resistance from other health professions, the path to securing employment was not smooth. Five years after graduating and accepting

my first position as a PA, I was terminated from my internal medicine job, along with two colleagues, by the administrators of a large academic hospital who cited lack of Ministry funding as the reason for termination. At the time, we were just a few of many PAs across the province whose roles were terminated when the MOHLTC and HealthForceOntario ceased providing salary support for PAs in 2015. Frustrated by the lack of policy and funding support around the PA role, and fueled with the knowledge and firsthand experience of what non-physician clinicians can offer to our healthcare system, I decided to pursue my PhD in Health Research Methodology as a foundation on which I could study the barriers and facilitators of PA integration in Ontario.

As a PhD student and more recently, as the Assistant Dean of the McMaster PA Education Program, I am engaged in research and education. I have been involved provincially, nationally and internationally in the PA profession in various roles as a clinician, educator, advocate and researcher, and it is with this lens that I approached the conceptualization of this dissertation. As a clinician, I have contributed to the healthcare workforce as a PA in hospital and outpatient settings (internal medicine and clinical dermatology). I have been actively involved in PA education as an Assistant Clinical Professor and Assistant Dean, and routinely collaborate with other PA and health professional program administrators across Ontario, Canada and internationally. As an advocate and researcher, I have been an active member of the Canadian Association of Physician Assistants, and continue to be a resource for discussions pertaining to health professional regulation and health human resources. Often each of these roles overlaps, which benefit PA working groups, provincial initiatives, and various stakeholder meetings with the Ministry of Health or the College of Physicians and Surgeons of Ontario.

This positioning as a researcher has benefits and challenges, and influences my relationship with study participants. My experience provides a unique insider perspective of the PA role, and allowed for extensive access to a network of government stakeholders, educators, PAs, and employers who contributed to various parts of this dissertation. As a

PA, my personal history and professional competences allow me to establish trust with study participants. Insider research starts with trust, which likely motivates participants to engage more actively with the research and provide candid data (45). I am familiar with their roles, have faced many of the same challenges, and am well positioned to know where colleagues are working. I also recognize that my attitudes and experiences can affect participant engagement and subsequent data analysis.

To mitigate the influence of these factors, I used a number of strategies. As the PA profession is still relatively small in Ontario, a research assistant conducted an interview any time there was a potential conflict of interest identified (e.g., a participant was a faculty member or previous colleague of mine) to ensure all participants were comfortable speaking about their experiences. This allowed for a degree of separation that enabled any interested PA to participate without fear of mistrust.

To minimize the influence of bias on the research process, I was as transparent as possible with colleagues and the members of my thesis committee in an attempt to bracket my biases and to ensure that coding and analysis decisions were always discussed with at least one other individual (clinician or non-clinician). In order to ensure transparency, I used the memo book available in the qualitative software used to store and analyze the data (NVivo) in addition to a paper journal to record decisions, thoughts, statements pertaining to reflexivity, and themes or categories that needed additional attention (i.e., for outliers or unexpected findings). Additional strategies are outlined under the section on trustworthiness. Ultimately, I realize the value of the data with which I have been entrusted, and feel a great sense of responsibility to draft a dissertation that allows me to “do right” by the participants, without being paralyzed by a fear of misrepresenting a finding or participant experience.

Epistemological reflexivity

The integration of PAs into the Ontario healthcare system is a practical problem that is of interest to me personally and professionally. Examining the epistemological foundations of the knowledge claims being made is central to understanding my reality as a researcher and the research process (52). As the primary investigator for this research study, I acknowledge that I approach my research interests with the epistemological views of a pragmatist, firmly situated between idealist and realist ontologies. I believe that the real effects or practical consequences of these research findings are vital components of both meaning and truth.

As each theme and factor reveals itself as part of the qualitative analysis, I am equally sensitive to the operational and practical consequences of the emerging concepts. In a health research context, a pragmatic view means that research findings are presented in a way that is practical and accessible (52), jointly comprised of perceptions and reality. My pragmatic approach to research situates me with an interest in the themes and experiences that can perhaps be improved through policy or knowledge translation, e.g., funding reforms to support salary sustainability. Additionally, epistemological reflexivity explains why I was drawn towards qualitative methodology and specifically to a case study design that allowed me to explore a number of settings, identify outliers, and develop cross-case summaries that are conducive to understanding the practical consequences of PA role integration.

Methodological reflexivity

Throughout the conceptualization and development of this research project, I strived to strictly adhere to case study methodology. This was often one of the more challenging aspects of the study conceptualization, as it was difficult as a novice case study methodologist to confidently navigate my case study protocol. I often found myself second-guessing research decisions, such as which participants to include or exclude, and how to organize the vast amount of collected data. Being sensitive to case study

methodology through regular monitoring and reflecting on the data collection process allowed me to keep moving forward while developing an awareness of the ethical, social and political considerations that were guiding this research (51). Reflexivity in this instance helped influenced reflection on how to best explore and describe negative findings e.g., findings that were challenging ethically, or that required political sensitivity to situate findings within the context of this research.

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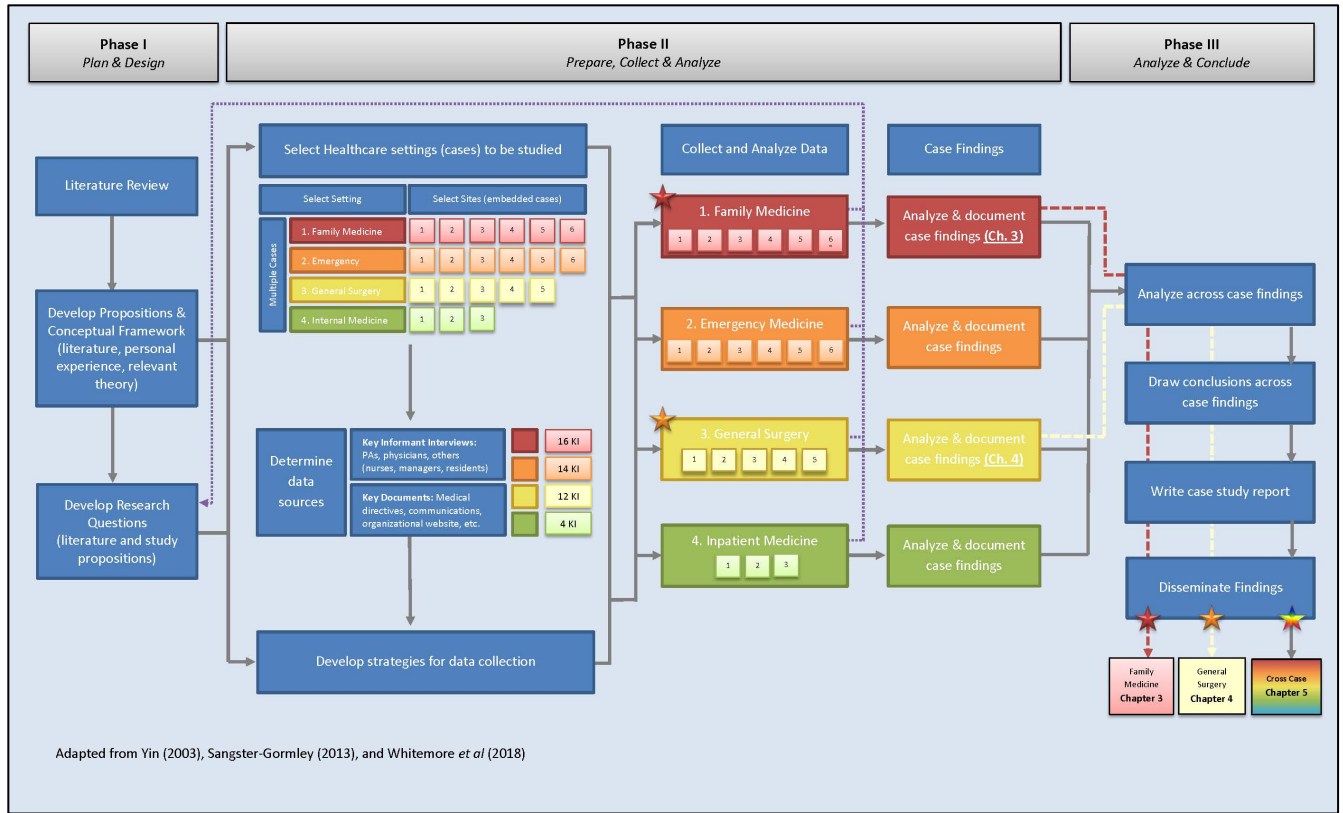
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Table 1: Summary of Key Concepts & Definitions

| Concept or Term | Definition |
|-----------------------------------|---|
| Collaborative care | Interprofessional process of providing comprehensive services (with patients, families, other healthcare providers, or communities) to deliver the highest quality of care across settings. (53) |
| Health Services Research | A multidisciplinary field of study including “social factors, financing systems, organizational structures and processes, health technologies and personal behaviors” impact access, quality and cost of healthcare. (54) |
| Implementation | In healthcare settings, the act of bringing in and introducing a new role, or putting a new health professional role into practice. (55) |
| Integration | In healthcare settings, the act of bringing a healthcare professional role into participation into a particular setting. For the purpose of this dissertation, it is assumed that integration occurs after implementation. (56) |
| Interprofessional | The levels of cooperation/coordination/collaboration that characterizes relationships between professions in delivering person-centered care (relationship between different professional disciplines). |
| Interprofessional team based care | Care delivered by intentionally creating small work groups in healthcare who are recognized as having a collective identity and shared responsibility for patient care for a specific setting or group of patients. |
| Role | The function assumed by an individual in a particular situation (57). For example, the PA role may be defined as a certified PA employed to provide healthcare in a hospital or community setting. |
| Role contribution | What is done or contributed by a particular individual or group of professionals to achieve something/help make something successful. |
| Role integration | Bringing a health professional into equal participation in a healthcare setting to contribute to a functioning system. |
| Role optimization | The process or act of maximizing the highest achievable performance under the given constraints of a healthcare setting. Relates to access, value and quality (58). |
| Success | The accomplishment of an aim or purpose; achieving a desirable or favourable outcome (57). |

Figure 1: Study Design and Conceptualization



CHAPTER 3: PROFESSIONAL, PRACTICAL AND POLICY FACTORS: OPTIMIZING THE ROLE OF ONTARIO PHYSICIAN ASSISTANTS IN FAMILY MEDICINE

Chapter Preface

This chapter focuses in on the role of PAs in family medicine settings, as the first of three studies exploring the role of PAs across various health care settings in Ontario.

I was responsible for conceptualizing the area of focus for this study and its design, as well as executing data collection and analysis. My supervisor (MV) contributed to the development of the interview guide and conducted the initial interview due to a scheduling conflict. A research assistant also helped conduct interviews when there were scheduling challenges or when I personally knew the participant.

Emerging themes and categories were reviewed with the entire thesis committee (MV, PM, JA, and ML). Interviews and data collection occurred between October 18th, 2017 and February 14th, 2018. In addition, participant member checking of themes occurred from May-June 2019 (additional details provided in the methods section of this chapter).

Finally, the thesis committee (MV, PM, JA, and ML) provided feedback on the final draft of this chapter.

Professional, Practical and Policy Factors: Optimizing the Role of Ontario Physician Assistants in Family Medicine

Abstract

Objective: To identify that facilitators and barriers that influence Physician Assistant (PA) role optimization and success in family practice settings.

Setting: Rural and urban family practice settings in Ontario that had employed a PA for a minimum of two consecutive years.

Participants: Six family medicine clinics in Ontario represented by seven family medicine Physician Assistants, eight Family Physicians (seven supervising physicians, one physician/administrator), and one clinic manager.

Method: To identify the factors that influence role success and barriers which prevent PA role optimization, we conducted an exploratory single case study with embedded subunits of analysis. Data consisted of semi-structured interviews with 15 participants and analysis of documents (medical directives, job announcements, and communications).

Main findings: Barriers and facilitators to PA integration and role success can be categorized into professional, practice based, and policy factors. Professional factors that facilitate role optimization include the professional relationship between the PA and physician, level of comfort with autonomy, trust, rapport and PA competencies. Practice factors that optimize the role include appropriate administrative support/organization, investment in PA training and patient satisfaction. Barriers include employer knowledge of medical-legal risks, communication around the PA role and accessibility of funding. Policy factors that limit role optimization and success include billing practices, absence of consistent funding models and lack of regulatory oversight.

Conclusion: Most of the barriers identified relate to enduring policy legacies, which continue to limit the sustainability and stability of PAs in Ontario. Successful Family Physician-PA teams have created individualized solutions to these barriers, and describe their partnership as increasing patient access to care, improving work-life balance, expanding comprehensiveness of services, and advancing team-based collaborative care.

Key words: physician assistant, family practice, qualitative, case study, health services research

Introduction

Physician Assistants (PAs) were first introduced to Ontario in 2006 by HealthForceOntario, with the first PA education program launched at McMaster University in 2008 (1). PAs were one proposed solution to help increase patient access to care, decrease wait times and to provide a flexible addition to the Ontario healthcare system (1, 2). PAs are trained in the medical model as generalists to extend and support clinical services within a formalized PA-MD relationship. The role of PAs includes obtaining medical histories, conducting physical examinations, ordering and interpreting diagnostic tests, diagnosing, performing or assisting with procedures, prescribing medications, patient education, counseling and health promotion (3). Research evidence from jurisdictions where PAs have a long history, such as in the United States, supports the effectiveness, safety, patient satisfaction, and contribution of PAs to primary care settings (4-6).

The PA profession is still quite new to the Canadian healthcare landscape, with variable uptake across provinces; the history of PAs in Ontario is presented in Table 1 (7). For example, a centralized funding model and a more deliberate approach to PA introduction has provided a strong foundation for the profession in Manitoba, with relatively recent expansion of PAs into primary care settings. In Ontario, government stakeholders and various organizations have proposed the use of PAs as one potential solution to primary health care priorities (2).

In their 2011 position statement on physician assistants, the College of Family Physicians of Canada identified a number of issues to consider when planning PA participation in family practice including: delegation of medical acts, remuneration issues, capacity and infrastructure, liability insurance, and impact on access to care, continuity of care in meeting patient and community needs (8). These issues were echoed in a 2013 Ontario study that examined the benefits and barriers of employing a PAs, including recruitment and retention, importance of regulation, funding, and lack of understanding about the PA role (9). In Manitoba, a 2016 study found that with appropriate provincial planning, site

preparation and optimized PA-physician teams, the PA role can be successfully introduced to primary care settings (3).

Significant human resource and finances have been invested into the PA profession in Ontario, but tensions exist around issues of role optimization, sustainability and funding models (1). Despite these challenges, there are numerous family practice teams in Ontario that have successfully integrated PAs. In these settings, ingenuity, various workarounds, and employer support have created opportunities for PAs to contribute to healthcare delivery by providing faster access, extending physician care, and augmenting primary care services.

In this project, we aimed to learn from these sites, asking how the PA role was optimized within family medicine settings by identifying barriers and facilitators to role integration through an exploratory qualitative case study. This knowledge contributes both policy and practical suggestions for operationalizing PAs in a way that improves access of Ontarians to comprehensive primary care. Given the existing literature and evidence from other jurisdictions, we were attuned to issues of supervision, organizational features, personal factors, and policy implications as potential study propositions. This study captures feedback and reflections from practicing family medicine PAs, their supervising physicians, and administrators. By examining family medicine settings where the PA role has been successful, increased awareness of facilitators and barriers to PA role optimization will help explicitly identify where provincial stakeholders can continue to build on the investments already made in the PA profession, and where family physicians/employers can strengthen PA integration within their own clinics.

Material and Methods

Study design

We conducted an exploratory case study with embedded subunits of analysis (10). This qualitative case study approach facilitates the investigation of a phenomenon within its context using a variety of data sources (11), including semi-structured interviews and documents (medical directives, communications regarding the PA role, stakeholder reports, etc.). Each case was defined as an Ontario family practice setting that had employed the same PA for a minimum of 2 years and where the position was deemed ‘successful’, as demonstrated by full-time permanent positions, low employee turnover, and ongoing funding.

Participant Recruitment

Certified (Canadian or US) PAs that had been working in a family practice setting for two years were recruited for the study, through the Canadian Association of Physician Assistants (CAPA) email distribution list, the Ontario PA Facebook page and Ontario Family Medicine PA Facebook group. Eligible participants had worked in their current primary care setting for a minimum of two years, in order to ensure sustainability of that particular role. Interested PAs were asked if other members of their health care teams would be interested in participating, which led to snowball recruitment of supervising physicians, clinic managers, and other administrators.

Data Collection

Using a semi-structured interview guide that included questions about the integration and the acceptance of the PA role in each setting, we conducted interviews with PAs, supervising physicians, and other clinic staff at each of the 6 included sites. Participants were given the option of phone or in-person interviews. Interviews typically lasted 30-45 minutes, and were conducted by the first author (KB), except when the participant had a professional relationship to the first author and a conflict of interest may be perceived to

exist. In these instances, the interview was conducted by the second author (MV) or a research assistant.

Data Analysis

Interviews were transcribed verbatim and data analysis was managed through N-Vivo (version 12). Data were analyzed by case (individual practice group) in order to identify categories specific to each case, and to identify cross-cutting themes across all family medicine settings (PA, Physician, and organizational factors). The primary investigator (KB) coded each transcript, and a non-clinician research assistant coded a random sample of interview transcripts to contribute a different perspective and to ensure data congruency. Thematic content analysis was conducted within and across each interview transcript, providing a flexible approach to identifying patterns and themes (12). Analysis moved through six phases, including: orientation to the data, generating initial codes, searching for themes, reviewing themes, defining themes, and producing a summary report (13, 14). In addition, research triangulation (between research team and research assistant) and ongoing contributions to a memo book helped ensure transparency.

A document analysis was also conducted, including the collection of site-specific documents, both archival and active, such as medical directives, job descriptions, and inter-department communications around the PA role alongside policy documents such as communications and position statements from the Ontario Medical Association (OMA), Ontario Hospital Association (OHA) and HealthForceOntario (HFO). Document analysis was used to understand the specific context of provincial stakeholder initiatives, and PA integration at each individual site. These documents help support the narrative describing the PA role and how they were integrated into their work setting.

Researcher Reflexivity

The primary author is a physician assistant and also a PA educator, and was familiar with PA roles, challenges, and was well positioned to know where colleagues are employed. Given the small number of PA programs in Canada and relatively small network of practicing PAs, the authors were cognizant of potential biases and took steps to ensure data collection and analysis was rigorous. However, having access to a PA network was helpful in study recruitment and in gaining the trust of research participants. As an important component of quality criteria in qualitative research, reflexivity was achieved through a number of strategies, including reflecting on personal assumptions and preconceptions, and how each of these may influence research decisions if not mitigated by optimizing trustworthiness (15).

Strategies for Achieving Trustworthiness

The design of case studies can help support the validity and reliability of research findings, in addition to the consideration of design principles relating to credibility, transferability, dependability and confirmability (15-18). These concepts and their respective definitions are outlined in more detail in Chapter 2. Reliability was supported through strict adherence to the case study protocol, creation of interview guides, and a document database. Validity and credibility, in terms of accurate representation of participant experiences, was reinforced through the triangulation of multiple sources of evidence, using multiple researchers to code transcripts and address emerging themes, and through member checking. Each participant received a copy of the study findings to ensure they could recognize their experience(s) in the study results.

Transferability was achieved through the use of descriptive explanation building, ensuring that experiences were closely linked to the context in which they were experienced (15). Finally, dependability and confirmability were supported through careful documentation and journaling to maintain an audit trail that describes the research steps and decision-making process used throughout the case study.

Ethics

This study received ethics approval from the Hamilton Integrated Research Ethics Board (HiREB) for McMaster University (Protocol #2270) and verbal and written consent was secured from participants.

Results

Six case sites were included in this study, encompassing eight physicians, one clinic manager and seven physician assistants (Table 2). PA participants included certified Canadian (civilian and military) and United States trained PAs, with 2-9 years of family medicine experience and an average of 1-4 supervising physicians.

This study identified factors that impact role success and optimization from the perspective of family physicians and PAs across family practice settings, and provided a clear description of each practice setting (Table 3). Participants informed us of challenges that could be ameliorated by clear pathways from a government agency or health professions regulatory body and highlighted personal and practice factors that have allowed for the provision of patient centered care. Each theme was classified under three overarching categories (Table 4):

1. *Professional* factors include the professional relationship between the PA and physician, level of comfort with autonomy, trust, rapport and PA competencies;
2. *Practice* based factors include administrative support, patient access to care, patient acceptance, and knowledge of medical-legal risks;
3. *Policy* factors include billing practices, absence of consistent funding models and lack of regulatory oversight.

In addition, the review and analysis of collected documents supported the experiences and perceptions verbalized by the study participants, and are therefore threaded throughout the relevant overarching categories.

Professional Factors

Relationship, Rapport & Trust

PAs and physicians emphasized the importance of trust and collaboration as significant facilitators in optimizing the PA role. Many of the interviewed participants detailed

personality characteristics, skill sets and competencies that promoted a strong working relationship between the PA and MD:

“We have a very collegial and collaborative relationship. It is very respectful. I honestly trust her and I know she honestly trusts me as well. I think it’s a very efficient one as well because we have similar thinking processes.” (MD)

Autonomy & Independence

The physicians, administrators and PAs acknowledge that the PA role functions with a very high degree of autonomy in terms of patient care:

“She’s very autonomous, she has a lot of experience, she knows her limitations, and she knows when to ask for help. She’s been great in that regard. And she’s highly efficient.” (MD)

Flexibility of the supervisory relationship allows the PA to function efficiently and to make the greatest impact on patient care. The level of required supervision is dynamic, and directly related to trust, rapport, experience and skill set. This relationship directly impacts how much autonomy or independence is granted to the PA. Physicians spoke to the benefits of PAs being trained in the medical model, and the benefit of approaching patient care in a similar fashion. Physicians recognized that their PA experience was highly influenced by the personality characteristics and the emotional intelligence of the PA. In some settings, the PA was employed and supervised by one physician, but in other clinics, multiple physicians supervised the PA. Although the PAs acknowledged the learning curve required adapting to different physicians’ practice styles, one PA reported that, *“I appreciate and enjoy [different practice styles] and I think it’s nice that it allows me to be able to see all kinds of styles and create my own.” (PA)*

Experience & Investment

Each family physician had variable previous knowledge or experience in relation to the PA role, including exposure to international medical graduates initially recruited to the Ontario PA pilot project, employment of Military PAs or familiarity with the PA role

through academic affiliations. Many of the physicians recognized the initial investment required to train a PA for the needs of their clinic, describing the importance of this investment in establishing a collaborative working relationship that would allow the PA to function with maximum efficiency:

*“I think the integration into primary care and family medicine has been very logical, very natural, and very progressive. I think our ability to use the skills of a PA is very obvious. I think there’s a lot of room and areas for [PAs] to come in.”
(MD)*

PAs and supervising physicians both felt as though the broad scope of practice and generalist training of the PA significantly benefits their patients, the clinic, and community. Generalist PA training provides opportunity to expand their skill set depending on PA interest, physician needs, and patient needs. One physician described his PA as a *“true primary care provider in the broadest sense”*. Physicians vocalized their dependency on the PA role, and how different their work life would be if the PA were no longer part of their practice.

Professional Barriers to Optimization

Physician knowledge around PA funding and salary support was highly variable. Some physicians were not aware of how their PA was paid or how the salary was supported, while others were very knowledgeable or had devised a funding system of their own. Many PAs were not happy with their current salary and reported no salary pay scales or pay increases despite increasing years of experience. Some PAs felt that their other non-physician colleagues are paid more to see fewer patients, but recognized that physician/clinic support of the PA role was partially dependent on the appeal of being more efficient while costing significantly less than other providers.

Practice Factors

Patient Acceptance

Across each of the family practice settings, both the physicians and PAs felt as though the PA role was now well accepted by their patients. Both physicians and PAs recognized that strong communication skills and earning patient trust are integral to patients accepting the PA role. Physicians recognize their role in introducing the PA to patients, and the impact this introduction has on role acceptance and integration. A few of the clinic sites provided examples (i.e., digital screens in the waiting room displaying information about the healthcare team) of how patients were introduced to the PA role. In some geographical areas, local media documents (i.e., newspaper article) highlighted the addition of a PA to the community/health team. Patient acceptance was strongly attributed to increased access and flexibility of appointments (i.e., same day appointments), increased availability of services and length of appointment time:

“I think it’s easier for patients to get in and get a same day or next day appointment with me working here... I feel like I get a lot of time to get to know my patients, which when working in a small community is really important.” (PA)

Reasons for PA Employment

Reasons for hiring a PA were variable across all sites depending on physician exposure, previous experience, funding sources, or clinic need. From the physician perspective, having a PA in their family practice setting was beneficial based on an improved work/life balance for the physician, the presence of the PA allowing for development of different expertise or skill sets (skill extension), increased patient satisfaction (i.e., better access to care, or hiring a PA to fill a gender gap), and better continuity of care for patients in their practice. PAs described success through improved continuity of patient care, developing a relationship with patients, being able to improve access to care, and the benefits of working in a collaborative practice setting.

Practice Barriers: Role uncertainty and limitations

At the practice/organizational level, challenges included initial uncertainty around the PA role and pushback from other health professionals. Pushback usually occurred around overlapping scopes of practice, and confusion on how controlled acts could be delegated.

Each of the interviewed PAs carries private liability insurance, but reported they have rarely been asked to submit proof to their employer, and their employers did not cover this annual expense. Interestingly, only one physician was aware that his PA carried independent liability coverage. The majority of physician employers were not aware of how their PAs are insured, or made assumptions about clinic or other coverage for the PA:

“In fact, I don’t know details of [liability coverage], but I’ll tell you the assumption I make is that anything a PA sees, a patient of mine, I’m responsible for overseeing that care...”(MD)

A review of professional liability documents from the Canadian Medical Protective Association (CMPA) and documents accessible to practicing PAs from CAPA highlights the disconnect between liability knowledge and practice (19, 20). Guidance was provided by CMPA almost 8 years after PAs were introduced into the Province, and only recently have PA employment toolkits contained information regarding professional liability insurance.

Many PAs expressed an interest in teaching PA or MD students, but the physician or clinic employer didn’t always see this as an appropriate for the PA. There was some physician resistance on using experienced PAs to teach undergraduate or resident trainees, and significant variation existed on how learners, when present, were introduced to the PA.

Policy Factors

Funding & Billing

Some physicians were not aware of how their PA was paid or how the salary was supported, others were very knowledgeable or had devised a funding system of their own.

Many of the PAs were initially supported by the Ontario Ministry of Health and Long-Term Care's "career start grant" which provided 50% of the PA's first year of salary. Physicians and PAs both voiced concerns about long term planning in regards to ongoing funding, and funding across all sites was quite variable. Many PAs were not happy with their current salary and reported no salary pay scales or pay increases despite increasing years of experience.

This was confirmed in the document analysis by a lack of formal or informal salary pay scales, outdated contracts, and vague job descriptions. Some PAs feel that their other non-physician colleagues were paid more to see fewer patients, but recognized that physician/clinic support of the PA role was partially dependent on the appeal of being more efficient while costing significantly less than other providers. In addition, physicians felt limited by current billing practices that don't allow the physician or PA to bill for PA visits, even at a lower rate: *"The current billing framework from the Ministry... it's a huge challenge; it's a huge barrier"* (MD). A review of Ministry guidelines regarding OHIP billing standards, audit requests and overall absence from PA employment toolkits further supports employer and PA concerns around funding and billing.

Health Professional Regulation

Many PAs are not sure what the future holds for regulation, and the physicians were generally not aware of current regulation issues or its impact on PA role optimization. A number of sites explained the various workarounds they have adopted in order to maximize the role of an unregulated health professional. The document analysis provided many examples of these strategies, such as the presence of broad medical directives, agreements with community pharmacies to accept PA prescriptions, and position statements from various stakeholders (i.e., College of Family Physicians of Canada position statement (21)) in order to provide role clarity despite lack of regulation.

Discussion

Summary of Key Findings

The identified factors, facilitators and barriers around role integration and optimization are consistent with collaborative care literature, nurse practitioner (NP) implementation literature, and PA integration literature from other jurisdictions (3, 9, 22-27). The positive influence of collaborative personal relationships was prevalent across each of the case study sites. Implementation studies in Manitoba echoed this finding, and identified the most critical factor for PA role success in primary care as a good relationship and “fit” between the PA and the supervising family physician (3). Participants from each of the family medicine case sites identified various facilitators and benefits, and proposed professional, practice based or policy solutions to barriers and gaps in PA role optimization (Table 5).

Strengths and Limitations

The case study approach does not aim to reflect all PA roles in family practice settings, but is useful for establishing an understanding of PA role optimization in Ontario Family Medicine settings. This study targeted settings where the PAs were deemed successful, as demonstrated by full-time permanent positions, low employee turnover, and sustainable funding plans.

Attempts were made to interview other health professionals, NPs, and administrative staff in these settings in order to understand the impact of the PA role on other clinic personnel in family practice settings. Unfortunately the research team, even with the support of study participants, was unable to recruit additional staff or clinician participants. Although physicians, PAs and administrators expressed their own perceptions of patient acceptance of the PA role, patients were not directly interviewed as part of this study but are one of the biggest stakeholders in provincial healthcare initiatives.

Interpretation and Implications

Successful collaboration in health care teams can be attributed to numerous elements, including interactional determinants (personal /partnership factors), organizational determinants (practice/ site factors) and systematic determinants (policy/provincial factors) (27). It was anticipated that the funding element would determine the type of patient (or reason for visit) directed to the PA, but instead distribution of work was based on other factors (patient's gender preference, etc.). With the widespread push for collaborative care models, determining the optimal scopes of practice is an essential element – unfortunately, current systems in place for determining and regulating scopes of practice preserve the status quo more than promoting change (28).

Broad factors that impact role implementation include a lack of legislative and regulatory authority for the role, no established funding mechanisms, lack of mentorship and knowledge of role, opposition from other medical professionals, lack of administrative support and inadequate organization of care (3, 22-24, 26). Systematic issues that contribute to the credibility of the role, such as legislation and regulation, have not been addressed in Ontario, which hinders PA role implementation, integration and practice. Provincial health departments and health system stakeholders need to work together to address identified barriers at the provincial level if optimal results are to be achieved (3). This may include long-term policy planning, support from professional associations and role standardization in order to support skill mix in primary care (24).

Multiple factors influence the success of the introduction of any new professional role. In one setting, a factor may act as a barrier, and in another setting, the same factor may facilitate the process (27). This was particularly evident across the family practice case sites through the discussion of medical directives. Medical directives can facilitate the process of integration and allow the PA to practice with significant autonomy, thus improving efficiencies and patient access. In other settings however, medical directives can be a barrier if they are too restrictive, or if they don't appropriately reflect the PA's

scope of practice and clinic needs. Interpretation of qualifiers within integration and PA role optimization research needs to be sensitive to “best fit” for each particular setting, PA-MD relationship, and clinic needs.

The balance between policy and professional/practice factors was evident across each family medicine site. The findings of this research support many of the key principles laid out in the 2011 College of Family Physicians of Canada position statement on physician assistants, including using a team-based approach to maximize the skill set of the professional in the primary care/family health practice team in a complementary manner, and the role of PAs as a resource within family practices (8). A stable funding platform and government support sets the foundation upon which the professional and practice factors can build. In busy healthcare environments, it is difficult to work with one in the absence of the other, but also difficult for exceptional professional factors to truly overcome the policy gaps. The gaps in billing and funding policies limit non-physician health care providers, such as NPs and PAs, from optimizing their contribution to the health care system. The extensive use of workarounds, although successful in many settings, leaves physicians and PAs feeling vulnerable. Family practice sites across Ontario reflect this balance and tension, and these challenges are likely to be echoed in other provinces looking to introduce PAs without a strong policy framework.

Conclusion

The success of PA role optimization is dynamic and multi-factorial. Collaborative relationships, personal experience, negotiation of autonomy, opportunities for growth and mentorship, patient satisfaction and mutual trust were repeatedly identified by both family medicine PAs and physicians as key determinants of successful PA role integration. Barriers to role success and optimization included PA dissatisfaction with salary and benefits, physician/employer knowledge of liability insurance requirements, and funding/billing challenges. The success of the included cases reflected the motivation from the clinic (practice), PA, and physician to create a collaborative team practice, improve patient access to care, and to work around the identified barriers. Physicians can strengthen integration by ensuring they are familiar with liability insurance, are providing competitive salary bands, are supportive of continuing professional development, and support their PAs in pursuing teaching or research opportunities that benefit both professions.

Stakeholders and policymakers need to consider multiple factors in order to ensure the continued success of PA role integration across Ontario. This research was limited to examining the role of PAs at the clinical setting level, but study participants also identified a number of systems and organizational level factors that influence role success. Although data is slowly emerging regarding the impact of PA integration from the perspective of those most closely involved, benefits (access to care, continuity of care, efficiency) have been openly acknowledged at local and national levels with little movement on the overarching barriers (lack of regulation and sustainable, consistent funding models) that would optimize sustainability and future role development. With increased interest in putting patients first through coordinated services and prominence of collaborative care literature, health system stakeholders should revive provincial efforts to create a sustainable program that optimizes the role of PAs in health care delivery by creating sustainable funding for salaries and sorting out regulatory legislation.

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Table 1: Timeline of Events Relating to PA Integration in Ontario

| Date | Activity |
|------|--|
| 2004 | The College of Physicians and Surgeons of Ontario (CPSO) proposed the introduction of PAs as one potential human resource solution to ensure that future needs of Ontario patients could be met (29). |
| 2006 | The Ontario Ministry of Health and Long Term Care (MOHLTC) announced Ontario's provincial health human resources strategy, HealthForceOntario. One component of the strategy was the creation of four new healthcare provider roles, including PAs (30). |
| 2007 | PAs in Ontario first introduced through pilot projects in community health centers and direct physician employment models. |
| 2008 | McMaster University accepts first cohort of PA students in the Bachelor of Health Sciences, Physician Assistant program. |
| 2011 | The College of Family Physicians of Canada released a position statement on physician assistants and interprofessional care. Under the direction and supervision of a family physician, PAs were among those professionals with the potential to augment access to family practice services and primary care (21). |
| 2015 | The Ministry of Health and Long Term Care released their “Patients first: action plan for health care”, which included a goal to “provide care that is coordinated and integrated, so a patient can get the right care from the right providers” (31). |

Table 2: Characteristics of Study Participants

| Location & Practice Setting | Participants | Site experience with PA |
|--|---|---|
| <p>Family practice settings included a mix of urban and rural settings, and academic (i.e., medical school affiliated) and non-academic sites.</p> | <p><i>Physician Participants:</i> 8 Physicians participated, including 7 family physicians (current PA supervisors), and 1 Physician/Administrator.</p> <p><i>PA participants:</i> 7 PAs participated, including: United States trained & US certified, Canadian (military) trained, Canadian (civilian) trained & Canadian certified PAs</p> <p><i>Clinic Manager:</i> 1 clinic manager/administrator participated</p> | <p>Site experience included: previous experience with International Medical Graduate PA, current PA employment experience, and multiple PA employer models.</p> |

Table 3: Embedded Case Site Characteristics

| Embedded Cases | Practice setting | Practice type & supervision | PA Training & Certification | Embedded Case Description |
|----------------|------------------|-------------------------------------|--------------------------------|--|
| Site 1 | Urban | Academic Usually 1 physician | United States trained, PA-C | Busy academic teaching centre. PA has heavy workload due to patient care, physician coverage, and administrative roles within the clinic. PA interested in teaching, but little update from supervising physicians/clinic administrators. PA known for specific expertise in well baby/well women exams and procedures. PA dissatisfaction with salary (has remained unchanged). Remuneration less than other non-physician colleagues who provide identical services. |
| Site 2 | Urban | Academic 1 physician per PA | Both PA Civilian trained, CCPA | Busy academic teaching centre. PAs responsible for providing patient care to a diverse range of age groups. Significant physician investment in PA satisfaction and role integration. Variation in how PAs are funded. Male/female provider balance verbalized by participants (i.e., hiring opposite gender to ensure patient care needs are met). PAs also provide considerable teaching support to medical students, residents, PA students, etc. Support of same day access/same day appointments important part of PA role. |
| Site 3 | Urban | Non-academic 4 physicians | Civilian trained, CCPA | Only site where PA cycles between 4 different supervising physicians, and can also be required at different sites. PA must adapt to various practice styles. Broad generalist role, responsible for patient care of all ages and genders. Male/female provider balance verbalized by participants (i.e., hiring opposite gender to ensure patient preference is considered). |
| Site 4 | Urban | Academic 1 physician | Civilian trained, CCPA | Busy academic teaching centre. PAs responsible for providing patient care to a diverse range of age groups. PA dissatisfaction with salary (has remained unchanged). Must supplement income with additional contract work in another setting. |
| Site 5 | Rural | Non-academic 1 physician | Military Trained, CCPA | PA had considerable experience prior to entering family practice setting. Enthusiastic supervising physician very supportive of military trained PAs. Support of same day access/same day appointments important part of PA role. Significant community impact as patients can access care locally and often don't have to wait for referrals outside of the region. Male/female provider balance verbalized by participants (i.e., hiring opposite gender to ensure patient preference is considered). PA dissatisfaction with salary (has remained unchanged). |
| Site 6 | Rural | Academic 1 physician | Civilian trained, CCPA | Most rural of all settings. PA very valued by physician (entire family health team) and by community. PA provides extensive community support and outreach (unique to other cases). Has had significant impact on physician quality of life. Very collaborative patient care. Male/female provider balance verbalized by participants (i.e., hiring opposite gender to ensure patient preference is considered). |

Table 4: Facilitators and Barriers to PA Role Optimization in Ontario Family Practice Settings

| Level | Facilitators | Barriers |
|--|---|--|
| <p>Professional & partnership factors between service providers</p> | <ul style="list-style-type: none"> ▪ Trust and rapport between PA and Physician ▪ Physician investment in PA training, orientation and continuing medical education ▪ Nurturing PA interests and expanding scope of practice ▪ Physicians motivated to stay “up-to-date” ▪ PA trained in medical model which facilitates PA-MD communication and collaborative practice ▪ PA level of independence & role autonomy ▪ Improved work-life balance for physician ▪ Physicians previous experience with/knowledge of PAs | <ul style="list-style-type: none"> ▪ Not using providers to full capacity or maximizing skill set ▪ PA dissatisfaction with salary (i.e., no incremental pay increase,) or benefits |
| <p>Practice/ Site factors</p> | <ul style="list-style-type: none"> ▪ Clinic familiarity with and acceptance of PA role ▪ Improved efficiency ▪ Clinic investment in PA training, orientation and continuing medical education ▪ Well defined measures of success: from clinic, patient, and provider perspective ▪ Opportunity for PA to take on mentorship or teaching roles ▪ Improved gender balance (i.e., male physicians with female PAs – well women visits) ▪ Building in “review time” to provider schedules ▪ Patient satisfaction ▪ Collaborative approach to medical learners ▪ Agreement around medical directives | <ul style="list-style-type: none"> ▪ Billing restrictions ▪ Understanding of liability insurance ▪ Resistance from other providers (i.e., NPs, Nursing staff, other allied health, other physicians in practice group) ▪ Knowledge of medical-legal-regulatory considerations ▪ Pharmacy resistance to filling PA prescriptions ▪ Failure to collect data or variables of interest to track impact ▪ “Death by medical directive” – too restrictive, limiting PA role and clinic efficiencies |
| <p>Policy/ Provincial factors</p> | <ul style="list-style-type: none"> ▪ Career start grants that encourage uptake and integration of PAs ▪ Investment and support of PA education programs ▪ Growing awareness of role potential of PAs in Primary Care settings | <ul style="list-style-type: none"> ▪ Lack of updated legislation, title protection and regulation/registry of Physician Assistants (Ontario) ▪ Lack of permanent funding models or sustainable Provincial funding plan for PAs ▪ Limited funding streams for PAs in Family Health Teams ▪ PA salary remains unchanged (i.e., starting salary is same salary 5-10 years later) |

Table 5: Practice & Policy Gaps and Proposed Solutions

| Identified Gap | Contextual Information & Proposed Solutions |
|--|--|
| Salary gaps and lack of sustainable funding models. | PA base salary was initially proposed 10 years ago, with no increase or living wage considerations. Employers should consider years of experience, retention bonuses, or the creation of a graded pay scale to ensure they are remaining competitive as the profession expands across Ontario and other Provinces. Government stakeholders should consider allowing physicians to bill for PA work/patient care at a lower rate, allowing for more flexibility around funding streams for non-physician care providers, and the collection of indicators to support the cost-effectiveness of the PA role. |
| PA interest in education or mentorship roles | PAs can take more ownership of personal interest in teaching and mentorship. Employers can then provide opportunities for PAs to take on various learners (when appropriate, and based on PA comfort and patient care experience). |
| Continuing Medical Education (CME)/ Continuing Professional Development (CPD) support and Canadian Certification (CCPA) status | Canadian PAs (CCPAs) must complete a minimum of 40 credits annually to maintain their certification status, and log a total of 400 credits over a 5-year cycle. Credits are logged through the Royal College of Physician and Surgeons MAINPORT ePortfolio (106). PAs and their employers should be aware of these requirements, and continue to seek opportunities for CME/CPD (33). |
| Understanding of liability Insurance | Supervising physicians and employers should request annual documentation of liability insurance to ensure their PA is covered. Although each PA clearly stated they carried their own liability insurance, employers were less certain about how they were covered when supervising a PA. PAs can carry professional liability insurance through Reid & Bradley Associates Insurance (20). |
| Regulatory status | Lack of health professional regulation for PAs continues to be identified as a barrier to role optimization and patient safety in the Province. Models from other provinces, such as Manitoba, have demonstrated that the College of Physicians and Surgeons provides the best framework for regulatory oversight given the nature of the supervisory relationship between PAs and MDs. |

CHAPTER 4: AT THE HEART OF COLLABORATIVE CARE: AN EXPLORATORY CASE STUDY OF PHYSICIAN ASSISTANTS IN GENERAL SURGERY SETTINGS

Chapter Preface

This chapter focuses in on the role of PAs in general surgery settings. The previous chapter (chapter 3) examined that various barriers and facilitators in family practice settings, as an example of an outpatient, primary care setting. This chapter will explore how PAs in hospital based surgical settings define their role, how their role is perceived by other health professionals, and to examine their contributions in surgical settings.

I was responsible for conceptualizing the area of focus for this study and its design, as well as executing data collection and analysis. Interviews and data collection for this particular study were conducted between January 18th, 2018 and October 10th, 2018, in addition to ongoing electronic correspondence with study participants (ceased in December, 2018).

My supervisor (MV) contributed to the development of the interview guide and helped conceptualize emerging themes from the data, which was an iterative process. One committee member (PM) assisted in reviewing and coding selected interview transcripts, and in developing thematic categories based on emerging themes. My entire committee (MV, PM, JA, and ML) provided feedback on my final draft of the thesis chapter, which was incorporated into the final version of this chapter.

At the Heart of Collaborative Care: An Exploratory Case Study of Physician Assistants in General Surgery Settings

Abstract

Background: Physician assistants (PAs) were introduced to the Ontario healthcare system in 2006. While they are well-established members of surgical teams in the United States, lack of clarity around roles, regulation, and funding has prevented smooth integration in Ontario healthcare settings. Without a clear understanding of the ways in which the PA role can complement that of other health care professionals, health care teams forego the potential benefits of this versatile health care provider that offers flexible and low-cost collaborative patient care.

Methods: Using an exploratory single case study design with embedded subunits of analysis, this research explores healthcare professionals' perceptions of the PA role in the surgical setting. Five sites where PAs were successfully integrated into surgical teams were selected. Data sources included interviewing of surgical team members and site-specific documents (job descriptions, medical directives, media publications).

Results: Thematic analysis of the interview transcripts identified three dominant themes. Firstly, the PA is a flexible care provider who is willing and able to assume required tasks. The flexibility of both the PA's professional role and skill set establishes a foundation on which two additional themes emerge: the importance of PAs in improving continuity and quality of person-centered care, and the role of PAs in facilitating interprofessional collaboration. Finally, a number of challenges that influence the contribution of PAs were identified, including navigating multiple supervising physicians, resistance from other health care providers, role overlap with residents, and lack of regulation and sustainable funding models.

Conclusion: PAs are flexible and adaptable team members who value interprofessional collaborative care efforts and positively impact continuity of care within general surgery settings. Understanding the central role PAs play in surgical settings can help elucidate the many ways they can contribute to the Ontario healthcare landscape, and provide lessons for other settings interested in integrating PAs.

Keywords: case study, physician assistant, health services research, surgery, interprofessional collaboration, roles.

Introduction

In 2006, HealthForceOntario introduced Physician Assistants (PAs) as part of a strategy to ameliorate healthcare challenges, such as long surgical wait times. As a generalist health care provider, PAs have a long history in surgical settings in the United States (1-3), and have previously been successfully introduced in other Canadian jurisdictions such as Manitoba (4). The use of PAs and other physician extenders in inpatient settings has continued to increase, reflecting a trend towards using strategies of increased interprofessional collaboration to respond to workplace challenges such as physician shortages, pressure to increase health care efficiencies, resident work-hour restrictions, and increasingly complex patient handoffs, (5-9).

As PAs are a new addition to the Canadian interprofessional team, little research exists to describe the role and contribution of this profession in surgical settings. The PA role in surgery may include any of the following obligations: taking first call with their supervising physician, responding to consult requests, screening of patients preoperatively, providing first-assist services in the operating room (OR), writing post-operative notes, managing peri-operative settings, conducting daily rounds, aiding in the aftercare of surgery, organizing patient discharges, collaborating with a range of healthcare providers as they liaise between services, and communicating with patients/families (3, 10, 11). PAs typically oversee patient care on the wards during the day and carry out surgical consults of patients in the emergency department when the staff and residents are occupied in the operating room (9). PAs in this setting are usually under the direct supervision of one staff physician, but staff physicians may constantly change, sometimes weekly, and thus the PA remains as the consistent healthcare provider and liaison between services. Responding to a high turnover of supervising physicians in complex surgical settings, while maintaining continuity, is just one challenge faced by the PA role.

One Canadian systematic review found that the addition of a PA or NP onto a surgical team is safe and cost-effective, based on an examination of factors including length of

stay, morbidity, mortality, effect on residents, satisfaction, and cost savings (12). Evidence from one Ontario site indicates that the introduction of PAs increased patient satisfaction, improved patient flow through more timely discharges, alleviated resident workload and improved resident satisfaction (9). Data from surgical sub-specialties, such as orthopedics, suggest that the benefits of integrating a PA also included time savings for the supervising physician, improved patient care, enhanced information flow, increased surgical volume and thus decreased wait times across Manitoba (10), and reduced surgical times, improved patient satisfaction and continuity of care in Alberta (11).

An emphasis on interprofessional practice and collaborative care is integral to the curriculum and competency standards of accredited PA education programs in the United States and Canada. PA programs must prepare students to work collaboratively in interprofessional patient centered teams (13) and to function successfully within a relationship with physicians and other members of the interprofessional healthcare team to optimize patient care (14). Evidence has shown that collaborative practice between different health professionals, including physician assistants, nurse practitioners, pharmacists, and physicians can improve patient access to care, job satisfaction, improved service delivery and productivity (15).

The promise of PAs to ameliorate the identified health workforce challenges (i.e., delayed discharges, physician workload, resident restrictions, etc.) is stymied by a lack of role clarity. Given the emphasis on collaborative, person-centered and interprofessional care, and in light of the limited knowledge of the role of PAs in Canadian healthcare settings, we undertook a study to explore how PAs in surgical settings define their role, how their role is perceived by other health professionals, and to examine their contributions in surgical settings.

Materials & Methods

Study Design

An exploratory single case study design with embedded subunits of analysis was conducted to examine the role of PAs in general surgery departments in Ontario hospitals (Figure 1). This approach was chosen because it allowed for an in-depth exploration of the health professional's role, while taking into account the larger context in which the role was embedded (16, 17). This qualitative case study approach uses a variety of data sources including interviews and document review of job descriptions, medical directives, and other stakeholder documentation around the PA role.

The case was operationally defined as Ontario hospital surgical settings. Embedded subunits of analysis were restricted to hospital based, general surgery settings in Ontario that had employed the same PA for a minimum of 2 years. The 2-year requirement ensured adequate time for role integration, and helped identify sites where the employer (e.g., physician, department or the organization/ hospital) had committed funds to retain a PA beyond the initial one year career start grants offered by the provincial Ministry of Health and Long Term Care (MOHLTC).

Participants

In order to identify sites that employed surgical PAs, a recruitment email and posting were circulated through the Canadian Association of Physician Assistants (CAPA) Facebook group, CAPA's email distribution list, and the Ontario PA Facebook page. Certified PA participants were eligible to participate in the study if they had worked in their current general surgery setting for a minimum of two years. Interested PAs were asked to assist in snowball recruitment of their supervising physicians, and other members of the health care team were also invited to participate. Five hospital sites were purposively selected as the embedded case sites. These embedded case sites met the inclusion criteria, and fit under the broader case definition (Table 1).

Data collection

We conducted semi-structured interviews with each health professional, using an interview guide that was adapted according to the health professional's role. The interview guide queried components relating to the PA role, how the role has been accepted, and any facilitators or challenges that had arisen since the PA role was introduced within the surgical setting. Participants were given the option of phone or in-person interviews, which typically lasted 30-45 minutes. Each interview was recorded and transcribed verbatim. The primary investigator (KB) or a research assistant conducted each interview based on participant scheduling and researcher availability. Informed consent was obtained from each participant before the interview began.

Site-specific documents relevant to the role of the PA (e.g., medical directives, job descriptions/ postings, and interdepartmental communications around the PA role) were collected from participants and publicly available sources and reviewed in order to provide context around PA role integration at each site. Existing and archived policy documents from various provincial stakeholders were also collated to understand the context of provincial stakeholder initiatives (i.e., communications and position statements from the Ontario Medical Association, Ontario Hospital Association and HealthForceOntario).

Data analysis

Interviews were transcribed verbatim and data analysis was managed through N-Vivo version 12. Data was analyzed in two phases in order to identify patterns and themes across the embedded sites and within the case:

- *Phase I* analysis was done within each general surgery setting and by participant (PA, physician, or other). Line by line coding helped identify data relating to broad categories within each case. In addition, a concurrent document analysis helps support the narrative describing the PA role, and situates the interview data in a broader policy and organizational (i.e., hospital setting) context (18).

- *Phase II* analysis was a cross-case analysis in order to identify crosscutting themes across all five General Surgery sites. Thematic analysis was used to identify cross-site themes, similarities and outliers across the various surgical sites.

In both phases, descriptive thematic analysis was used to identify themes and patterns of participant experiences. Emerging data relating to the identified themes and patterns was organized under the appropriate heading, and then re-organized into sub-themes. Finally, the emerging themes from participant transcripts were pieced together to form a comprehensive picture of their collective experience (19).

The primary investigator (KB) coded each transcript, and a second author (PM), both healthcare professionals, coded a random sample of interview transcripts to contribute a different perspective and to ensure data congruency. Emerging themes, patterns, and rival explanations were discussed amongst the full research team, which included a physician assistant (KB), physiotherapist (PM), physician (ML) and two non-clinician health systems and policy researchers (JA, MV).

Validity & Reliability

Adhering to a case study protocol that included case selection criteria, interview guides, and a document database fostered reliability. Validity was supported through the use of multiple sources of evidence (documents, organizational websites), establishing a clear chain of evidence, and using various researchers to code the interview data and address rival explanations. Pattern matching, explanation building and replication logic were also used to establish overarching relationships across each general surgery site (17). These specific case study tactics also helped address the trustworthiness of the research study by establishing credibility (triangulation, peer debriefing), transferability (descriptive explanation building), and confirmability (reflexivity, clear chain of evidence) (20-22).

Ethical Considerations

All participants provided informed consent to be interviewed for this study. This study received ethics review and approval from the Hamilton Integrated Research Ethics Board (HiREB) as referenced in protocol #2270.

Results

Interviews were conducted with 5 physician assistants (all Canadian certified PAs), 6 physicians (3 surgeons, 2 General Surgery residents and 1 Director of Interprofessional Education), and 1 registered nurse (Director of Interprofessional Practice) across the five embedded case sites. The sites included 1 rural, non-academic hospital, and 4 urban/academic hospitals. Each PA was Canadian certified (CCPA) and had been practicing in general surgery for 2.5 to 5.5 years at the time of data collection. The PAs reported working with 2-18 different supervising physicians, depending on the setting and physician scheduling. Participant demographics are described in aggregate in order to protect confidentiality (Table 2).

Guided by the embedded sub-unit analysis, study findings are organized into three interrelated themes (Table 3). Firstly, the PA is a flexible care provider who is willing and able to assume required tasks. This definition of their professional role and influence of their skill set establishes a foundation on which two subsequent themes emerge: the importance of PAs in improving continuity and quality of person-centered care, and the role of PAs in facilitating interprofessional collaboration (Figure 2). Finally, a number of challenges that influence the contributions of PAs to surgical settings were identified across all sites.

Data derived from the document analysis further supports the themes that emerged from the interview data. Examples of where specific documents, such as medical directives, orientation packages, toolkits, organizational websites or grey literature are threaded under the relevant themes outlined below.

Defining the PA role and influence of skill set

Function of the PA role in General Surgery

Across the participating study sites, PAs are enthusiastic and engaged health care providers who assume a range of roles that facilitate and enhance the provision of patient-centered care on the surgical service. Participating PAs readily described why they had chosen the profession, how they define their role as surgical PAs, their perceived impact within surgical/hospital settings, and their perception of what core competencies are needed to be an effective and efficient surgical PA. One PA described, *“I feel like I bridge that gap where a lot of patients feel like they’re misunderstood, that the doctor doesn’t care, or may not hear their concerns”* [GS1-PA], while another stated that the PA role has *“a really meaningful impact of [a] patients’ journey through healthcare”* [GS2-PA].

Across the five embedded case sites, an important part of the PA role is facilitating communication and administrative tasks that are essential to the effective functioning of the surgical team, such as communicating between patients, surgeons, and other members of the healthcare team, and coordinating discharge planning, family meetings, and driving quality improvement initiatives. PAs provided assistance in the operating rooms, organized resident orientations, and often provided medical teaching.

Improving quality of care

PAs had a significant impact on improving quality of care through two dimensions: continuity of care and person-centered care. PAs assist in achieving continuity of care by being the main liaison between the surgical team and other services, made possible by their constant presence while surgeons and residents rotate on/off service. PAs are viewed as a “constant” in surgical settings and significantly contribute to continuity of patient care by being available to other staff, residents, patients and their families. Within surgical settings, surgeons are often busy in the operating room or in out-patient follow-up clinics, which leaves a patient care gap that is filled by the PA. This allows the PA time

to focus on getting to know their patients, thus efficiently operationalizing patient care plans that can be shared with others new to the case.

“Continuity of care, patient care, helping the residents get accustomed to their role and the service... and making sure our team runs smoothly and effectively... We’d be at a huge loss if we didn’t have a PA on our team in terms of making [these things] happen.” [GS2-MD]

Quality of care is improved by having the PA as a designated point-person for the team, which facilitates many tasks: *“Everything gets dealt with much faster, all the med recs get done, everyone is on DVT prophylaxis, everyone is discharged early in the day, all the prescriptions are filled out” [GS5-PA]*

Some of the embedded surgical sites presented documents that demonstrated organizational support of PAs, which highlight the role of PAs in delivering high-quality care. In addition, publicly available twitter posts from a number of supervising physicians also echo the role of PAs in providing quality, person-centered care within their respective hospital settings.

Person-centered care

As an agent of continuity, the PA often follows the patient from hospital admission or preliminary consultation, through to the ward, operating room, post-operatively and sets up discharge planning. If the patient returns with complications, it is usually the PA who is most familiar with the patient and their case history.

“We kind of tie everything together through allied and nursing and physicians. There’s just much more open communication and the patients end up happier. There’s time to talk to [patients] about education, explaining what’s wrong with them, what to expect, treatment...” [GS5-PA]

Patient- and system- specific benefits include: *“decreased length of stay, getting patients up to the same day surgery, patient satisfaction, less re-admissions for complications, earlier recognition of clinical changes... better communication and discharge planning... [A] more multidisciplinary approach” [GS5-PA]*

Both surgeons and PAs also highlighted a number of examples where the PA contributed to the surgical setting through quality improvement/quality assurance initiatives and leadership roles. A number of the embedded surgical sites had publicly available documents either supporting the integration of PAs (i.e., social media articles, recognition of National PA Day) or outlining quality improvement projects initiated by their PA team members. For example, one PA-based surgical team created a mobile app for patients discharged from their service. This app allows patients to connect with the surgical PAs for questions relating to post-surgical care. This initiative increased patient access to medical care (from the patients' home), and has decreased the number of emergency room visits.

Facilitating interprofessional collaboration and team functioning

PA at the heart of collaborative care

Residents, surgeons, PAs and nursing staff emphasized the PA role as being “*extremely reliable, very much an integral component*” to the collaborative care team. Staff and residents felt as though the presence of a PA on their surgical service kept the team running smoothly as the continuity provided by the PA enhances interprofessional communication.

Participants indicated that PAs greatly improve interprofessional communication by acting as a bridge not only between patient and physician, but also between residents and other healthcare professionals:

“I’ve seen before and after, and I think it’s just so much better having a PA working with us than what we had before. I think that it just really helps our teams run better and helps our patients be better cared for.” [GS2-MD]

Resident collaboration, support and mentorship

Many PAs were tasked with resident and medical learner orientation and teaching, and thus were a valuable resource to learners. In clinical settings with high turnover such as surgical wards, the PA becomes the “*face of the team*” and a constant knowledgeable presence on the ward where there is a continuous change of surgeons and residents.

Residents reported that *“it’s less chaotic”* when working with a PA on their team, because the PA is more organized, they *“work with the other allied health members regularly”*, and make things smoother because they *“know how things are done”* [GS2-R]. The PA takes on many tasks that then offer an opportunity for the resident to engage in learning activities. In many settings, efficiency and continuity are improved by transferring these non-clinical tasks to a PA. As summarized by one of the surgical residents:

“[The PAs] really fill in so many gaps so that residents can ensure that they’re getting maximum educational opportunities without... becoming overwhelmed with service type obligations. They’re very reliable... With a PA available, it’s much easier to make sure you attend your educational rounds, leave for teaching, going to the OR... there’s much less interruption during the daytime because the PAs can often field a lot of the questions” [GS4-R]

Residents benefit by having the opportunity to concentrate on tasks with more educational value, patients benefit as continuity of care improves and tasks get done efficiently, and physicians benefit as they know the PA is available to complete non-clinical tasks, answer questions, support allied health staff, etc.

Document analysis also echoed these findings. In one setting, the PAs had created an orientation manual for residents. This 32-page resident handbook provided excellent context to the role of PAs at this particular site and was authored by two surgical PAs. This handbook explains the role of PAs as a team resource, and how various services work in the context of general surgery (i.e., consulting services, inpatient care, appropriate medical protocols, discharge planning tips, and useful tips for the various surgical teams).

Physician-PA collaboration

PAs reported having a positive impact on physician workload and improving physician job satisfaction. By having a PA available and accessible to both the surgical ward and operating room, operating rooms are more likely to be on time as the PA can deal with patient care issues on the ward, discharges, family meetings and other tasks that would have pulled the surgeon from the operating room or required additional time at the end of the day.

“The surgeon doesn’t have to stay until like 8:00 or 9:00 at night... their quality of life is much better, their job satisfaction is much better... Some of them enjoy coming on service for the week now, instead of dreading it. I think that’s a big change and they really notice when I’m not there, so much so, they want to hire somebody else to be available for when I take vacation” [GS5-PA]

Establishing mutual respect and trust between the PA and supervising physician allows the PA to reliably prioritize and effectively execute tasks collaboratively with the health care team:

“The continuity of having somebody who’s available and knows the patient. I know I can trust her. I know her assessments of patients are going to be bang on because I’ve worked with her for a long time, whereas some of the new residents who come in, they don’t necessarily have the same reliability” [GS2-MD]

A number of websites, including Canadian PA blogs, provide further evidence of documentation that support the importance of establishing mutual trust and respect. For example, one PA has created a public blog posting that outlines how their position was integrated, and the dynamic nature of the supervisory relationship.

Factors that limit PA contributions

Despite the reported success of PA integration across the surgical settings, physicians, interprofessional leaders and PAs identified a number of systemic, organizational and professional factors that contribute to the PA’s role uncertainty and vulnerability. Many of the reported inter-personal challenges arose from lack of a role clarity that was associated with the lack of regulation:

“Other physicians’ not knowing what I did was a challenge... I always felt when I went out to the [emergency room] to assess someone, they were confused. What are you? Are you a medical student, are you a nurse? Who are you?” [GS1-PA].

PAs reported using a range of descriptors and comparison to others healthcare providers in order to explain who they are to learners, staff, patients and families. Examples included *“an extra pair of hands, as physician extenders”* or *“I use the NP analogy”* [GS4-PA], *“I’m a ‘resident’ for the rest of my life”* [GS2-PA], and *“frontline face of the surgical team”* or *“person of contact between a nurse and your surgeon”* [GS3-PA].

In addition, confusion around the delegation of medical acts and interpretation of medical directives can lead to role conflict due to resistance from other regulated health care providers. PAs at two sites reported refusal from other health care providers (e.g., registered nurses, occupational therapists, physical therapists) to take orders not signed by the MD *“I can’t really take that order from you because my college says that I can’t”* [GS5-PA]. Furthermore, PAs acknowledged the challenge of working with multiple supervising physicians:

“There are still some misconceptions about my potential... The level of autonomy I have can sometimes vary depending on who the supervising physician is on that week that I’m reporting to” [GS2-PA]

Physicians identified broader organizational and policy factors, such as nursing union resistance, *“there’s a very strong nursing union who is pushing probably very hard against PAs and to integrate nurse practitioners into those roles”*, and government funding structures (i.e., no inclusion of PAs into provincial health funding system (OHIP), accessible funding streams) that negate physicians’ interest in *“the quality and the abilities of physician assistants”* [GS4-MD]. Physicians also provided numerous suggestions for improving integration, including having access to *“some kind of more formal training process to understand what [PAs] can and can’t do”* [GS4-MD] and *“better training in terms of how to integrate a PA as a service”* [GS2-MD].

The analysis of positions statements from various health care organizations, including the Ontario Hospital Association (OHA) and various Ontario nursing associations supports this narrative by demonstrating broader political support or resistance of the PA profession (23-25). Although not specifically targeting hospital employed PAs, these types of positions statements are often circulated amongst members where they filter down to front line workers and impact perceptions.

Navigating role uncertainty

Despite the identified challenges, PAs are able to compensate for role uncertainty through the strategy of demonstrating their skill set and enthusiasm, focusing on patient care, and “developing role awareness and relationships with the different staff” [GS2-PA] which ultimately had a positive influence on collaborative care teams. Surgeons, residents, and interprofessional directors also recognize the challenges and were broadly supportive in explaining ways to maximize PA role contributions:

“I think the biggest hurdle we had to overcome was really understanding what their scope of practice was as unregulated healthcare providers... where in the past it felt like they were really big hurdles, now... you know that one of the most important things you need to do is create role clarity” and “where we’ve got physician assistants, the nursing team feels much happier because they know they’ve got access to the PAs... to maintain care... you’ve got this bridge that works between the professional team. That has been hugely successful... I believe the organization and the leaders play a very important large role in setting the stage and creating that environment that enables [the role] to really grow” [GS2-RN/DIP]

Discussion

Principal findings & relation to other studies

The participating PAs were enthusiastic, and engaged health care providers who have adapted to fill gaps in their surgical settings. Central to the PA role is their ability to navigate role uncertainty by demonstrating their skill set (including surgical knowledge and communication skills) and enthusiasm for their role. This characterization of “who we are” as a health professional sets the foundation for “what we can do” in surgical settings, demonstrating a dynamic interplay between what the PA brings to the setting and how they identify opportunities to coordinate the provision of patient care and also improve gaps (Figure 3). In addition to surgical PA’s abilities to fill in gaps, they were also described as being accessible, available, reliable, and flexible.

This study highlighted the role of PAs in surgical settings, and substantiated the impact of their role in improving service provision. PA availability during daytime hours when

residents and surgeons are commonly in the operating room allows for more efficient and thorough patient care. Furthermore, PAs can offer a continuity of care that rotating residents and surgeons (who often change weekly) are unable to provide. This continuity translates into PAs having an in-depth perspective of each patient's care, and provides PAs with an opportunity to recognize areas where systems can be improved to increase safety. It is inevitable that the PA will play an intermediary role, serving as the *"face of the team"* between staff surgeon, nurses, patients, families and residents. In contrast to other areas of inpatient care, direct face-to-face communication between nursing and surgical staff is challenged by the need for surgeons to be present in the operating room, seeing consults in the emergency department, and attending to off-service patients.

The information provided by residents and surgeons is consistent with other literature that demonstrates how PAs improve resident rotations in surgery by decreasing resident workload, improving resident experience (9, 26), and how the role functions to support medical learner/resident orientation and teaching. In addition to compensating for resident work our restrictions, academic medical centers that employ PAs or nurse practitioners benefit from increasing patient throughput, patient access to care, improving patient safety, reducing length of stay and improving continuity of care (27).

The identified themes around the role of the PA in delivering collaborative, interprofessional care echo many of the competency domains of the Canadian Interprofessional Health Collaborative interprofessional framework, including interprofessional communication and conflict resolution, role clarification, patient centered care, team functioning and collaborative leadership (28). Given the strong foundation of focus on collaborative, interprofessional care as part of PA training (29), it should not be surprising to see the positive influence of the PA role in busy inpatient settings. Health care delivery can be significantly improved when the model of service delivery is based on team collaboration between health care professionals (15).

As echoed by the physicians, interprofessional leaders, and PAs in this study, there are essential elements that are part of the interpersonal process, including communication skills, a willingness to collaborate, mutual trust and respect (30). Much like the challenges faced by nurse practitioners, the willingness of the healthcare provider and their individual relationships can partially overcome the effect of system restrictions (31). In addition, the responsibility and accountability for patient care outcomes are strongly influenced by a number of other factors that often fall outside the realm of clinical practice (32). These systemic factors are influenced by how budgets are allocated, significant differences in remuneration across professions, institutional quality assurance protocols, collective agreements, and how health professions are regulated (30).

Although the PA profession is rooted in collaborative care, there are systemic and organization factors highlighted in this study that influence the PAs ability to maximize their contributions in general surgery settings including lack of regulation, variable funding, and role clarity. These challenges and barriers are consistent with other implementation literature, especially around other non-physician, high-level care providers like nurse practitioners and anesthesia assistants (33) in terms of role confusion and lack of knowledge around role clarity.

Strengths and limitations

As very few studies exist around the role of PAs in Canada, focusing in on specific sites as part of a larger case study protocol was a helpful way to identify practical implications. While case study findings do not aim to be generalizable (34), they do provide an excellent method to explore context-specific phenomenon. Findings from this study could be extended and explored in other PA employment settings, such as internal medicine and subspecialty services that rely on multiple physicians, residents and fellows to provide patient care.

This research is unique in that it gave practicing PAs an opportunity to explain and define their roles. Having a dual perspective (from PAs and their colleagues) is important for understanding role clarity, especially within multidisciplinary team settings that emphasize collaborative care team models. This approach allowed for role definitions, facilitators and barriers to be identified by all members of the care team, rather than having one profession speaking on behalf of other disciplines in the same setting. This also allowed for congruency to ensure that other participant's also echoed findings reported by one team member, and paralleled across the other hospital sites.

The sampling strategy of recruiting sites through PAs was efficient and straightforward. Most participants had a medical background, and despite our efforts to recruit participants from a variety of disciplines, only one nurse participated in the study. Given resistance from other health care providers and issues around role clarity are often cited as barriers to new role implementation (i.e., nurse practitioners) (35-37), future research on the PA role needs to focus on the acceptance and understanding of the PA role from all front line health care providers.

Implications for practice and policy

In clinical environments with a high degree of physician or resident turnover (i.e., clinical teaching, internal medicine, and surgery units, etc.), the PA role can have a significant impact on continuity of care. The PA role is well suited to these settings due to the flexibility, availability and adaptability of the profession, allowing for efficient patient management. However, efficiency and collaborative care can be impeded by lack of regulation (that limits PA scope of practice optimization), lack of role clarity (that can lead to resistance from other team members), and lack of organizational support. A funding model which provided sustainable support for PA salaries would allow for collaborative and interprofessional care practices across a variety of settings. Changes to current care models should take continuity of care into consideration (12).

Future research

Within hospital environments, the decision to hire a PA may have come from an individual surgeon, a department, or a broader organizational decision, which may complicate aspects of PA integration such as role implementation, funding, oversight and management. Unfortunately the lack of consistent funding models for PAs in hospital settings complicates the uptake, sustainability, and integration of PAs across the province. This instability makes it difficult to establish a strong quantitative research foundation given the variability and turnover.

Future research should continue to build on PA, nurse practitioner and other literature around tracking specific outcomes of interest within general surgery settings. Factors of interest may include quality of post-operative care, length of stay, patient outcomes, complications, readmissions, and other economic outcomes (i.e., cost savings) to fully define the benefits of PAs in surgical settings. A focus on the development of valid outcomes for measuring these indicators, as well as evaluating continuity of care as it pertains to safe and effective sign-out and handover (67) would also align well with increased awareness of the role of surgical PAs in improving these important outcomes.

While health professional perception is favorable towards the impact of PAs on patient care experiences, future research needs to directly engage patients and their families to seek their feedback regarding the PA role. To date, only two studies have explored Canadians' willingness to receive care from PAs: one in emergency department settings (38) and an additional patient satisfaction survey in orthopedic surgery (11). Patient feedback was positive in both settings, but additional patient engagement around the PA role should be pursued in provinces that have already integrated PAs, or are considering their introduction to ensure feedback is acknowledged from all stakeholders.

Conclusion

PAs are playing an integral role in the delivery and support of healthcare within surgical settings across Ontario as flexible and adaptable team members who value interprofessional, collaborative care. As the PA profession continues to expand and evolve across Canada, a greater understanding of role definition, impact on interprofessional collaborative care, and professional perceptions will help maximize efficiencies and minimize barriers to PA practice in surgical settings. Understanding the central role PAs play in surgical settings can help elucidate the many ways they can contribute to the Ontario healthcare landscape, and provide lessons for other settings interested in integrating PAs.

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Figure 1: A Case Study of PAs in Ontario General Surgery Settings

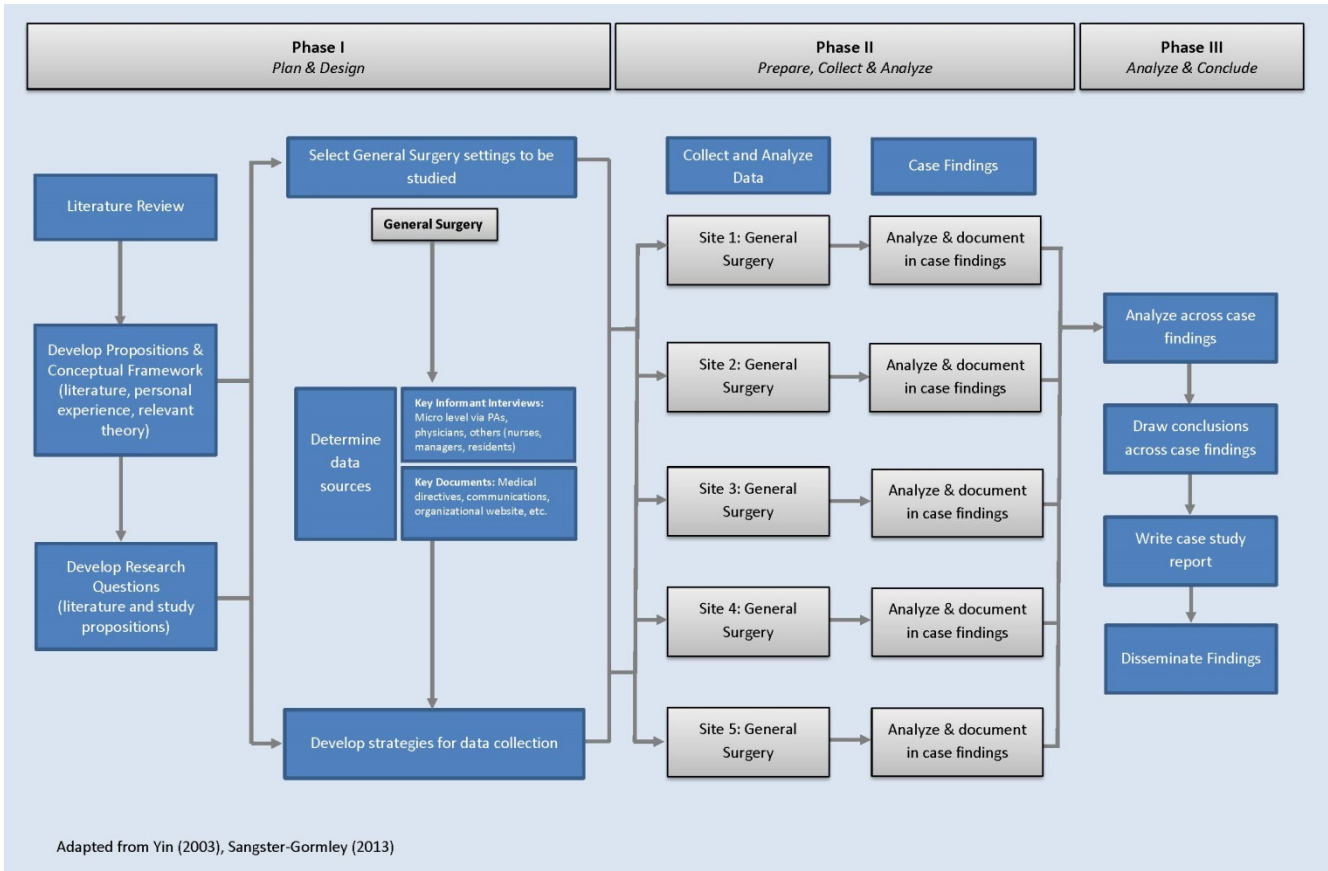


Figure 2: Schematic Diagram of Case Study Themes

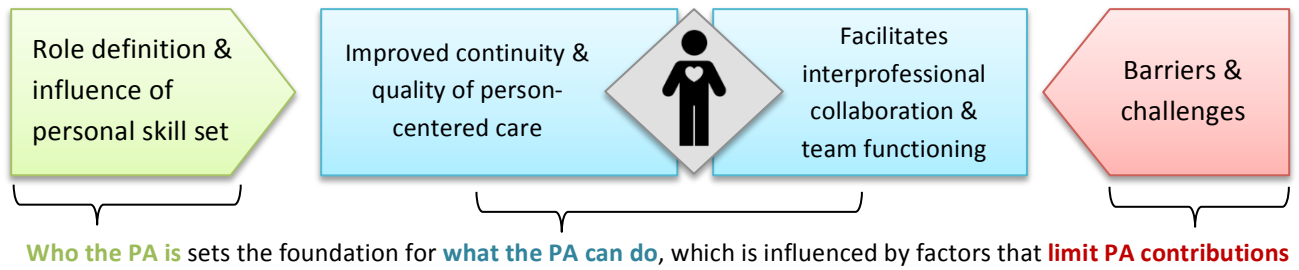


Table 1: Selection Criteria for Embedded Case Sites

Inclusion Criteria

- Hospital based general surgery setting
- Canadian or US certified Physician Assistant (CCPA or PA-C)
- PA had been employed in general surgery setting for ≥ 2 years
- Supervising physician, resident, hospital staff and/or PA needed to be willing to participate

Exclusion Criteria

- Outpatient or community surgical setting
 - Part-time employment status of the PA
 - Sites with complicated travel or scheduling logistics that exceeded research budget or time frame
-

Table 2: Study Sample Characteristics

| | |
|-----------------------------------|--|
| Sites | |
| Hospital Settings | 4 urban/academic, 1 rural/non-teaching hospital |
| Locations | Southern Ontario |
| PAs per site/department | 1-3 |
| Surgical specialty teams | Included: General surgery, hepatobiliary, acute care surgery |
| Individual Participants | |
| Physician Assistants | 5 (4 female, 1 male) with 2-18 supervising physicians |
| PA years of experience in Surgery | 2.5-5.5 years |
| Supervising Physicians (Surgeons) | 3 Surgeons |
| MD experience with PA | 2.5-10 years |
| Residents | 2 Residents |
| Other | 2 Directors of Interprofessional Practice/Education |

Table 3: Summary of Case Study Themes

| Main themes | Thematic Description |
|---|---|
| <p>Role definition and influence of skill set (A flexible care provider willing and able to assume required tasks)</p> | <ul style="list-style-type: none"> ▪ PA role definition and characteristics in surgical settings: a flexible, knowledgeable, accessible and reliable health care provider (shapes role to fulfill needs of the team) ▪ Enthusiasm for choice of specialty (surgery), role as team member and interest in improving efficiencies/bridging gaps ▪ Strong communication skills (conflict resolution, etc.) across multiple settings ▪ Involvement in Quality Improvement initiatives and other leadership roles ▪ Challenge of role uncertainty, professional identity and vulnerability due to role clarity, scope of practice, funding challenges, lack of regulation and concern PA might outgrow role |
| <p>Improves continuity and quality of person centered care</p> | <ul style="list-style-type: none"> ▪ Integral team member at the core of collaborative care in high staff/resident/patient turnover environments ▪ Improves quality of care of surgical patients across departments; Increases patient satisfaction ▪ Tailors care to patient (“Patients first” approach); integrative care through the communication and sharing of information for coordination and continuity across the continuum of care ▪ Challenge of system/organization factors that limit role contribution to patient centered care |
| <p>Facilitates interprofessional collaboration & team functioning</p> | <ul style="list-style-type: none"> ▪ Collaborates with all members of health care team, patient & family ▪ Considers needs of all team members and patients/families in the delivery of care/services ▪ Increases resident/learner support & mentorship: takes on non-clinical tasks that improve efficiencies and allows team members to focus on their contributions to patient care ▪ Establishes MD-PA working relationship & mutual trust ▪ Contributes to high degree of staff & resident satisfaction ▪ Challenge of role clarity and role overlap that limit potential contributions to healthcare teams |

CHAPTER 5: UNDERSTANDING HEALTH PROFESSIONAL ROLE INTEGRATION IN COMPLEX ADAPTIVE SYSTEMS: A MULTIPLE-CASE STUDY OF PHYSICIAN ASSISTANTS IN ONTARIO, CANADA

Chapter Preface

This final research chapter provides a broad cross-case exploration of PA role integration. As described in previous chapters, chapter 3 and chapter 4 are presented as single, exploratory case studies with embedded subunits of analysis (the various clinical sites that comprised the family medicine or general surgery “case”) but also constitute two of the four “cases” selected for the broader cross-case analysis presented in this chapter (chapter 5). The multiple-case study presented this chapter provides a rich qualitative analysis of “why” and “how” PAs have been integrated within Ontario, and outlines the factors that contribute to role optimization or failure in complex health care systems.

As in the previous two chapters, I was responsible for conceptualizing the area of focus for this study and its design, as well as executing data collection and analysis. Interviews and data collection for this multiple case study was conducted between October 18th, 2017 and October 10th, 2018. My supervisor (MV) contributed to the development of the interview guide and helped conceptualize emerging themes from the data, which was an iterative process. The entire thesis committee (MV, PM, JA, and ML) provided feedback on the final draft of this chapter and approved the manuscript for journal submission.

**Understanding health professional role integration in complex adaptive systems:
A multiple-case study of Physician Assistants in Ontario, Canada**

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This chapter has been submitted to BMC *Health Services Research*, and is formatted accordingly for manuscript submission.

Abstract

Background: To meet the complex needs of healthcare delivery, the Ministry of Health and Long Term Care (MOHLTC) introduced Physician Assistants (PAs) into the Ontario health care system in 2006 with the goal of helping to increase access to care, decrease wait times, improve continuity of care and provide a flexible addition to the healthcare workforce. The characterization of healthcare organizations as complex adaptive systems (CAS) may offer insight into the relationships and interactions that optimize and restrict successful PA integration. The aim of this study is to explore the integration of PAs across multiple case settings and to understand the role of PAs within complex adaptive systems.

Methods: An exploratory, multiple-case study was used to examine PA role integration in four settings: family medicine, emergency, general surgery, and inpatient medicine. Interviews were conducted with 46 healthcare providers and administrators across 13 hospitals and 6 family medicine clinics in Ontario, Canada. Analysis was conducted in three phases including an inductive thematic analysis within each of the four cases, a cross-case thematic analysis, and a broader, deductive exploration of cross-case patterns pertaining to specific complexity theory principles of interest.

Results: Forty-six health care providers were interviewed across 19 different healthcare sites. Support for PA contributions across various health care settings, the importance of role awareness, supervisory relationship attributes, and role vulnerability are interconnected and dynamic. Findings represent the experiences of PAs and other healthcare providers, and demonstrate how the PAs willingness to work and ability to build relationships allows for the establishment of interprofessional, collaborative, and person-centered care. As a self-organizing agent in complex adaptive systems (i.e., health organizations), PA role exploration revealed patterns of team behavior, non-linear interconnections, open relationships, dynamic systems, and the legacy of role implementation as defined by complexity theory.

Conclusions: By exploring the role of PAs across multiple sites, the complexity theory lens concurrently fosters an awareness of emerging patterns, relationships and non-linear interactions within the defined context of the Ontario healthcare system. By establishing collaborative, interprofessional care models in hospital and community settings, PAs are making a significant contribution to Ontario healthcare settings.

Keywords: Physician assistant, interprofessional care, case study research, health policy, qualitative research, complex adaptive systems

Background

Physician Assistants (PAs) are advanced clinical practitioners trained in the medical model to extend physician services, and are currently employed in a wide variety of healthcare settings across a number of countries, including the United States, United Kingdom, Australia, and the Netherlands (1-3). The role of PAs may offer solutions to the inherent tensions between service demands, training requirements and budgetary restraints, compensate for cyclical health workforce shortages, provide a flexible addition to the healthcare workforce, provide team continuity, and improve patient experiences (3-6). Hoping to achieve similar results in Ontario (Canada), the Ontario Ministry of Health and Long Term Care introduced PAs in 2006 as a potential health human resource innovation to improve access to care, reduce wait times, and support the complex needs of healthcare delivery in Ontario (7-9).

Despite the growing interest in PA integration and uptake of PA employment across the province, few studies have explored the PA role in Ontario, especially from the perspective of PAs, other healthcare providers (i.e., physicians, nurses, residents), and administrators. Limitations to PA research are attributed to a lack of comparator groups, poor study setting descriptions, and the consideration of evidence from the United States where context (e.g., healthcare funding) is often different (CBOC report, 2016). Compounding the dearth of research evidence are a number of barriers that limit PA role sustainability, including lack of health professional regulation, unstable funding sources, and other resistance from other health care providers.

PAs were introduced as one potential health care innovation to induce change at a systems level and their ongoing integration requires careful documentation and analysis. Understanding the relational aspects of care delivery is critical for innovation success, and being deliberate about interdependencies and their role will lead to improved interventions, especially in the context of policy change that promotes effective coordination and communication among health care providers (10). Analysis of the

diffusion of this health systems innovation is constrained by a lack of information on which processes enable and sustain integration in health service delivery and organizations, the context of how the innovation (i.e., PA role integration) is situated in particular settings, and whether these processes can be enhanced and replicated (11).

We approach the examination of the role of PAs in the healthcare system through the theoretical lens of complexity theory, and consider the PA to be one agent in the complex adaptive system (CAS) of healthcare. Complex Adaptive Systems theory focuses on relations and interconnections of health system components and can be useful in explaining behavior in complex and unpredictable phenomena: service delivery, organizational and workforce development, and leadership change (12, 13, 14). In terms of application to health services research, CAS is most commonly used as a conceptual framework applied to research approach and design, followed by its use in data analysis or the interpretation of findings (14). The advantages of using CAS include a focus on relationships and interactions instead of simple cause and effect models, providing a framework for categorizing knowledge and agents, and providing a more complete picture of forces affecting change (15).

Health care systems are nonlinear, dynamic and unpredictable and are comprised of a network of components (e.g., hospitals, clinics, families, patients) that interact nonlinearly on different levels (e.g., patient, medical center, government) (12). Complexity theory, or CAS, suggests that the key to understanding the healthcare system is examining the patterns of relationships and interactions among the system's agents (13, 14), which lends itself to exploring and conceptualizing the role of PAs as new members of Ontario healthcare teams.

The aim of this study is to explore PA role integration in the Ontario healthcare system through an in-depth analysis of setting and role descriptions, described outcomes, and healthcare provider perceptions. This investigation is organized around the research

question: What factors influence successful PA integration in Ontario, Canada? By additionally examining the role of PAs as agents in the health care system through a complexity theory lens, this study will provide additional insight on the relationships and interconnections that frame PA role integration and contribute to broader health services research.

Methods

Aim, design and study setting

In order to examine PA integration in Ontario, a multiple case study approach was chosen. Exploring multiple cases allows the researcher to understand the differences and the similarities between cases (16, 17), and to analyse the data within and across sites (16). The evidence generated from multiple case studies allows for a wider discovery of theoretical evolution and research questions, thus creating a more convincing theory (17). The case study method is appropriate for this study as health professional role integration is complex, context dependent, and involves social processes (18). This method allows for the in depth exploration of setting specific contextual factors, the identification of consistent factors by analysing across cases, and for knowledge to be developed about how and why some events and situations affect others (19).

Four purposefully selected health care settings that employed PAs (i.e., family medicine, emergency medicine, general surgery, and inpatient medicine) were chosen as the cases (Figure 1). Inpatient medicine sites consisted of internal medicine and cardiac intensive care unit settings. PAs were recruited from a range of different sites within each of the four healthcare settings. Within each case/setting, individual practice sites were selected as embedded subunits of analysis. This multiple-case study is bounded by the Province of Ontario, and the phenomenon of interest is the successful integration of PAs into Ontario health care settings. “Successful” settings were defined as sites where the PA had been

employed for a minimum of two years, and were either permanent full time employees, or were eligible for ongoing contract work.

Data Collection

Data sources included key informant interviews, site-specific documents, and government communications relating to the PA role. Key informants (i.e., participants) were recruited through the Canadian Association of Physician Assistants (CAPA) email distribution list, and postings on the Ontario PA Facebook group. PA participants who met the inclusion criteria were asked to recruit other members of their respective healthcare teams with assistance from the research team. Inclusion criteria specified that the PA had to be employed in one of the four settings of interest for a minimum of 2 years to participate.

Semi-structured interview guides were developed for PAs, residents/learners, physicians, administrators/managers and other health care providers who worked directly with the individual PA at their respective site. The interview guides were structured around the identified theoretical propositions as informed by evidence, grey literature, and personal experience:

1. The generalist medical training of PAs has the potential to impact role definition in a dynamic healthcare system;
2. Barriers and facilitators to PA integration are interconnected and relationship dependent;
3. Physician knowledge and experience with the PA role impacts role integration success;

The interview guide queried components relating to the PA role, how the role has been accepted, and any facilitators or challenges that had arisen since the PA role was introduced within the four settings. Participants were given the option of phone or in-person interviews, which typically lasted 30-45 minutes. Each interview was recorded and

transcribed verbatim. Interviews were conducted by the first author (KB), the local principal investigator (MV), or a research assistant depending on participant scheduling, researcher availability, and to mitigate any potential conflicts of interest (e.g., when the research participant was known to a member of the research team). Informed consent was obtained from each participant before the interview began.

Site-specific documents relevant to the role of the PA (e.g., medical directives, job descriptions/ postings, media publications, and organizational websites relating to the PA role) were collected from participants and publicly available sources in order to provide context around PA role integration at each site. Existing and archived policy documents from various provincial stakeholders were also reviewed in order to understand the context of provincial stakeholder initiatives. These included communications and position statements from the Ontario Medical Association, Ontario Hospital Association, College of Family Physicians and HealthForceOntario (20-22). This concurrent document analysis helps support the narrative describing the PA role, and situates the interview data in a broader policy and organizational context.

Data analysis

Interviews were transcribed verbatim and anonymized for uploading into N-Vivo version 12. Data analysis for both the interview transcripts and document database was managed through the N-Vivo qualitative software program. Data were analyzed in three phases:

- Phase I consisted of a case description (explanation building) and an inductive thematic analysis for each of the four case settings (family medicine, emergency medicine, general surgery, and hospital inpatient medicine).
- *Phase II* involved a thematic cross-case analysis in order to identify crosscutting themes to explore the similarities and outliers across the four case settings. Outliers were defined as unique perspectives or case exceptions that deviated from the central themes, or were discordant to other case/setting characterizations (23).

- Phase III consisted of a deductive exploration of the identified cross-case patterns and themes pertaining to complexity theory, especially around CAS principles related to relationships, interconnections and uncertainty. Interpretation of the data entailed identifying key concepts that explain relationships between the themes and theoretical assumptions, in addition to highlighting messages that are relevant to policy makers.

The primary investigator (KB) coded each transcript and sorted the relevant documents within the database. A random sample of interview transcripts were coded by a second reviewer (either a research assistant or PM) in order to ensure data congruency. Emerging themes, patterns, and case outliers were discussed amongst the full research team, which included a physician assistant (KB), physiotherapist (PM), physician (ML) and two non-clinician health systems and policy researchers (JA, MV).

The multiple-case analysis started with the development of a description of each case setting (Table 1) (16). The process of identifying the factors/themes that fit each case (family medicine, emergency medicine, general surgery and other inpatient hospital settings) was an iterative process, cycling back and forth between the emerging themes and case data. Factors and processes were only included if they were supported by the data (as documented in the chain of evidence) and if they related to the initial study propositions and research aim. Themes were generated for each case setting and were then reviewed in the context of the other settings to determine cross-case similarities and to determine outliers. Given the extensive volume of data generated from each case, details on the development of each theme are not provided. A summary of the each case analysis, including details on the embedded case sites, is presented in Figure 2, and in greater detail elsewhere for family medicine and general surgery settings (see Chapter 3 and Chapter 4, respectively). An overview of the full research protocol and approach is demonstrated in Figure 3.

Validity & Reliability

Pattern matching, explanation building and replication logic were used to establish overarching associations across each of the four cases (16). Reliability was supported through adhering to a case study protocol. The case study protocol included case selection criteria, interview guides for each member of the healthcare team, and a database of collected documents. Validity was reinforced by using multiple sources of evidence (e.g., medical directives, new media articles, and organizational websites), establishing a clear chain of evidence, and using multiple researchers to code data derived from the interview transcripts, and to address rival explanations (24-26). Each of these case study strategies also helped support the trustworthiness of the research study by establishing credibility (through triangulation and peer debriefing), transferability (descriptive explanation building), and confirmability (reflexivity and documenting the chain of evidence) (27-29).

Ethical Considerations

This study was reviewed and approved by the Hamilton Integrated Research Ethics Board (HiREB), as documented in protocol #2270. Each participant in this study provided informed consent prior to his or her interview.

Results

Forty-six health care providers and administrators were interviewed across 19 different healthcare sites (hospitals = 13, community clinics = 6), including 24 physician assistants, 17 physicians, 2 medical residents, 2 registered nurses, and 1 family health team administrator.

Although there are some variations between practice settings, such as the time and nature of physician collaboration and number of supervising physicians, there were numerous similarities identified in the cross-case analysis. Four interconnected themes emerged from this multiple-case analysis: PA role contribution to Ontario healthcare settings; developing role awareness and role clarity; supervisory relationship dynamics; and variability in funding and remuneration (Table 2). In addition, a number of outliers are

presented within the context of the cross-case analysis. These outliers represent experiences, outcomes or exceptions that deviated from the main emerging themes. In addition, the contextualization of PA role integration across the various clinical sites was supported by the analysis of collected documents.

Role Contribution to Ontario Health Care Settings

The PA role provides a versatile, flexible, and accessible health care provider who models collaborative, interprofessional care in complex settings. Favorable contributions of the PA include increasing patient access to care, fostering person-centered care, improving continuity and filling gaps in the health care system.

In addition, PAs take on a large amount of administrative work, such as patient care documentation, discharge summaries, dictations, consult requests, and resident/learner orientation, which helps improve patient flow.

“The success has been that they’re part of...a team that has taken a program with 1,200 cases and gone to 1,800 cases, with the same number of beds, right. They’ve become a significant part of our improvement and operations... We had all kinds of budget problems with... physician coverage, so they were also an economic success...a tangible reduction in costs for human resources during the day.” [MD, IM]

One unique contribution of PAs is the flexibility and adaptability of their skill set. Across all settings, physicians and PAs provided examples of where being consistently present in their setting or working with particular patients allowed the PA to become a procedure or content expert due to frequency of exposure and clinical experience, or develop a skill set that extends physician services:

“I think because I’m there every day and the doctors rotate, I’ve actually probably performed more of those procedures than most of the docs I work with” [PA, EM]

This expertise is reflected in physician feedback that described how other consulting services (e.g., orthopedic surgeons) started to prefer getting consults from the PA because of the PA’s understanding of the precise information that the consulting service requires:

“They’re so specialized and they see all of those cases, so [they’ve learned] exactly what each specialist wanted, [they’ve learned] how they wanted them cast, they really paid attention to these details that 30 [emergency doctors], who don’t get the same volume and maybe aren’t interested in the same way... so [there’s] really a great deal of satisfaction among orthopedic specialists who take referrals from the PAs.”[MD, EM]

One identified case outlier involves the interplay between increased patient volume and other setting-specific considerations. In settings such as general surgery, increased patient volume in the emergency department (e.g., patients waiting for a surgical consult) or an overloaded ward (e.g., arising when surgical beds are filled to capacity) puts a strain on staff because of the number of consults to be seen, pending discharges, and additional families to update. Faster surgery turnarounds facilitated by PAs may mean a higher need for recovery and ward beds, which were not always available. In contrast, physicians at Family Medicine sites were enthusiastic about the ability to handle increased patient volume because this meant increased access to care for patients and increased remuneration for physicians.

Developing Role Awareness and Role Clarity

The importance of role awareness and establishment of role clarity was echoed by all participants across the four settings. PA participants described both benefits and challenges associated with being an unregulated health care provider:

“Being unregulated is also a big thing, because now... unions in the hospitals that have a strong union presence, being unregulated does raise a lot of questions, especially when there are budget cuts... and then they start bringing in different levels of providers that aren’t regulated. It creates a bit of tension” [PA, GS]

In addition to challenges around lack of regulation, participants also reflected on the complexity of navigating delegation, controlled acts and variable uptake of medical directives. As others in the network of PA care (e.g., patients, health care providers, and administrators) became more aware of the PA role, role clarity is gradually established.

Participants acknowledged the importance of organizational support; both for when the PA role is first introduced, and as it pertains to successful integration and role evolution.

Ultimately each case setting is now heavily reliant on the PA to deliver services, including day-to-day patient care, quality assurance initiatives, other administrative roles (i.e., lead PA), and resident or learner orientation and teaching. Navigating role and work environments with medical learners and residents can be challenging, as the potential exists for challenges around role clarity and overlap. However, these can be ameliorated by an appropriate orientation of learners to the team players and roles within a site that employs a PA. Physician perception is an important driver of this role clarity:

“A resident is there to learn; their primary responsibility is towards their education. PAs are also learning and everything we invest in them we get back. But at the same time, the PAs have a bigger responsibility to manage flow, so they are more efficient generally than residents are, and they are always there... they’re not having to relearn the process” [MD, EM]

Unfortunately organizational and physician support can be undermined by other healthcare professions who may not understand the role, not accept orders written by the PA, or actively demonstrate resistance to role integration: *“I know other pharmacies have a hard time understanding the role of PA and reject some prescriptions” [PA, FM]*, thus decreasing service delivery and efficiencies. In all settings, the PA’s enthusiasm, self-organization and role awareness enables the PA to either change perceptions or find strategies to maximize efficiencies.

With respect to case outliers, it was clear that the PA role is most easily defined by all team members in Family Medicine settings. This is likely influenced by the longitudinal nature of the PA-MD-patient relationship, and the parallel practice of the PA and MD. In emergency settings, any impact of continuity of care is limited to the PA-MD shift schedule and role definition is less controversial due to the close proximity of the work environment. PAs and MDs are seeing patients, interacting with nursing staff, and updating families in close geographical proximity, and opportunities to discuss a patient

are more available. In general surgery and other inpatient settings, role clarity is more complicated due to turnover of residents, patients, surgeons/staff physicians in the midst of new consults, discharges and larger interprofessional healthcare teams.

Supervisory Relationship Dynamics

A key characteristic of the PA-physician relationship is trust, and the physician's understanding that the PA knows when to seek help influences the development of trust. The physician must trust the PA to seek help, and the PA needs to feel confident that the supervising physician is readily available for consultation when required. Failure to seek help or support the PA negatively impacts the relationship dynamics.

"If it's a new doc, or I'm unfamiliar. Or if they're a new hire and haven't worked with a PA, they're going to want to review most patients with us. But again it depends. It'll also depend on my comfort level with a patient. If [the patient] is presenting [with something] I'm really not familiar with, or I feel that the patient is a lot more sick than I'm comfortable dealing with, then absolutely I'll bring in my doc much sooner than otherwise." [PA, EM]

The nature of the supervisory relationship allows PAs to learn from a variety of practitioners. There is considerable setting-dependent variability in the number of supervising physicians that work with a PA (ranged from 1-18). PAs are therefore exposed to a variety of practice styles, personalities, bedside manners, medical expertise and other consulting services. PAs can then adapt their own practice style by observing others and determining patterns that work best within their own setting and clinical environment:

"I appreciate and enjoy [different practice styles] and I think it's nice that it allows me to be able to see all kinds of styles and create my own" [PA, FM]

Working with multiple supervising physicians also requires the PA to constantly adapt their own practice as *"everyone has a slightly different clinical approach" [PA, FM]* that requires the PA to *"deal with multiple personalities" [PA, GS]*. Negative interactions occurred when the PA felt alone or felt as though they lacked supervisory oversight:

“I was somewhat left to my own devices at times when I feel like help might be needed and help’s not always readily available when the rest of the team is in the operating room”[PA, GS].

In addition, variable physician knowledge regarding liability and supervision was identified across each case setting.

Family medicine sites had a significantly reduced number of supervising physicians, compared to the other cases/settings. The family medicine PA-MD team are more likely to work in parallel, with both seeing their own patients and reviewing patient information together only when necessary. In settings with multiple supervising physicians, the PA must also adapt to a variety of practice styles and preferences, which can be a benefit (i.e., can adapt their own practice style) or a hindrance (i.e., there can be varying levels of autonomy that require the PA to constantly adjust their approach to satisfy the supervising physician).

Impact of System Variability on Funding and Remuneration

Across all four settings, funding was consistently identified as a challenge. PAs stated:

“I’m not satisfied [with remuneration] because we are still at the same rate as actually, a little less, than when I was hired over 5 years ago, so that’s very frustrating” [PA, EM], or that “There has been very little increase. I do have job security which is nice, but there are absolutely no benefits, no increase in vacation [time]... there’s been nothing, so that’s very frustrating” [PA, FM].

In addition to dissatisfaction with their salary, cross-case analysis revealed very little employer/organizational responsiveness to consideration of incremental cost of living increases. Most PAs reported that their salaries have remained unchanged since the PA role was introduced to Ontario in 2006.

Funding comes from multiple sources, including global hospital budgets, departments, pay-for-performance, other allocated funding sources (i.e., Family Health Team allied health funds) or directly from physicians. The challenge of these variable sources is the dependency on intermittent, short stream funding and its impact on role sustainability.

One Emergency Physician described the precariousness of funding PAs based on their contribution to meeting a pay-for-performance incentive to reduce wait times:

“The danger is that if our [department] performance went down, then we would no longer be able to afford [our PAs] or if the province stopped the program, we would no longer be able to afford them. So our PAs live in fear every year, because they do not have stability in their jobs. They do not have contracts; they do not have job safety.” [MD, EM]

Physicians and PAs across all settings called for a re-examination of funding and regulatory status:

“My wish would be that there’s some funding model that comes up through OHIP (Ontario Health Insurance Plan) that would pay for them; procedure codes or coverage codes or something so there’s some funding available for [PAs].” [MD, IM]

“...Hospitals are constantly having to cut the budget; and that’s kind of what we’ve been running into lately is, more and more were being kind of asked to prove, not so much prove, we’ve proven our work; but we’ve been essentially told that, we love you guys, but we can’t necessarily fund you forever” [PA, EM]

One noteworthy case outlier relates to evidence of inappropriate billing practices and perverse incentives in select Emergency Departments. The organization was covering the salaries for the PAs in the emergency department, while the physicians were personally billing for the services offered by the PAs: *“they cost nothing for us to have them, they generate income for doctors” [MD, EM]*, or *“gaming the system”* through physician or departmental use of the PA to earn incentives. For example, in multiple cases the Emergency Department arranged PA workflow to assess patients quickly, thereby maximizing their chances of meeting a pay-for-performance target and receiving a financial bonus for reducing wait times. The downside is that patients often waited longer to then be cleared by the physician, demonstrating multiple inefficiencies and the opposite intent of the incentive:

“Basically the whole reason you were sitting there is so you could write up a note to put a time on it, and then the patient would come in and say, the patient came at 8 to triage, you wrote a note, showed the doc at 8:05, and in the records it was like,

oh the patient was seen in 5 minutes. But they weren't seen in 5 minutes...now they'd go to the other waiting room and wait 2 hours to see the doctor. So their real wait time was 2 hours, but on paper it was 5 minutes, and to the government looks really good, and so then they can give the hospital more money.” [PA, EM]

In general, billing and funding issues are more complex in hospital settings as there is often no clear funding source, like in family health team PAs; conversely, liability insurance is less of an issue in hospital settings if PA is a hospital employee and thus covered under organizational insurance.

Findings from Document Analysis

The analysis of participant provided documents (e.g., medical directives) and publicly available websites, position statements, and other communications pertaining to the PA role was helpful in supporting findings both within and across cases. In most instances, the document database supported participant experiences and perceptions. For example, the impact of role resistance and challenges around role clarity were easy to comprehend in light of various position statements released across the province, either rejecting or supporting the PA profession. Documents such as medical directives and organization websites describing the addition of PAs to various healthcare teams helped support participant experiences with how their roles were introduced, and provided a framework to understand the factors that impact efficiencies (e.g., presence or absence of medical directives).

There were a few exceptions where a document conflicted with participant experiences, such as navigating health professional liability insurance (e.g., varying participant perception about who is covered, cost to employer, and how to access liability coverage) and PA/employer knowledge of continuing professional development requirements for PAs. Overall, findings from the document analysis demonstrated the same complex variability and non-linear outcomes around PA integration experienced by PA, nurse, interprofessional lead, physician and resident participants.

Discussion

The multiple case study generated cross-case themes that helped identify the various barriers, facilitators and systemic factors that impact PA role integration in family medicine, emergency medicine, surgery and other inpatient settings. Results from the cross-case analysis establish a foundation for understanding how the PA role contributes to Ontario health care settings, the importance of developing role awareness and clarity, the dynamic supervisory interface between physicians and PAs, and the impact of system factors on role sustainability. As described in other literature, individual PAs roles are described as moldable, which allows the PA to work across silos within the organization in order to fill the needs of their setting. Working across these barriers enables PAs to address care delivery gaps, provide continuity, increase collaborative care, enhance communication, aid patient flow, enhance care during transitions, and free up physician time for other patients or activities (3, 30, 31). Most importantly, PAs contribute to a relationship infrastructure that enables effective communication between patients and their health care team.

The cross-case analysis revealed that factors such as funding, perverse incentives, understanding of liability, lack of regulation and role clarity are often messy and unclear across multiple settings (Table 2). These discrepancies limit long-term relationships (between the PA and employer), sustainability, role success, and the optimization of efficiencies. Understanding differences in the way that role uncertainty manifests in different clinical settings can lead to an improved understanding of the types of improvement efforts (either adaptations or enhancements) that may be more effective (10).

The characterization of PAs as one of many self-organizing agents in complex adaptive systems (e.g., health organizations) allows for barriers and facilitators of PA integration to be considered in the context of a complex network of stakeholders, interactions, events and collaborations. Across each of the four case settings, PA role integration is non-linear,

dynamic, and influenced by cross-case factors. The PA role, by nature of its role diversity, flexibility, and focus on patient-centered care, embodies a dynamic approach to health care delivery that facilitates interactions between other health care providers, medical learners, patients and families. However, as one agent in a large health care organization, the success of the PA role is influenced by role uncertainty, complex funding streams, relationships (both negative and positive), and distributed control as experienced by study participants.

Reflecting on CAS theory and its relevance to this study, the results highlight the operational differences and variations in how the PA role is funded, employer or physician knowledge of funding sources, knowledge of appropriate billing practices, and role descriptions. This is reflected in the observation that the same policy objective (i.e., MOHLTC introduction of PAs) can lead to multiple local configurations and interactions, as demonstrated across cases. Some CAS studies suggest that this variability may allow for a more robust health care system that can adapt and self-organize (32), and where intrinsic properties can be exploited to guide healthcare in a more favorable direction (12). The variation identified in the cross-case analysis demonstrates multiple different configurations of the PA role that have adapted and self-organize to best serve the setting in which the PA is employed. By removing boundaries between health professionals, aligning goals, enabling adaptation and experimentation, and establishing simple rules to limit expenditures, health care systems can move towards a complex systems approach that permits variability and self-organization (12).

The application of a complex system theory approach as it pertains to the health human resource innovation of PA integration in Ontario is novel. Although complexity theory has not been explicitly applied to the PA profession, other research supports the use of CAS to explain why interdisciplinary teams are successful in the provision of services when cases are complex (33), and to explain how patterns of interactions between health team members define team behaviour (34). Complexity theory is well suited to explore PA role

integration given the complexity of healthcare settings including multiple stakeholders, multifaceted issues, uncertainty, diverse agendas, and interconnected relationships.

Exploring PAs as one agent in a complex adaptive system was helpful for examining the iterations, complexity, emerging patterns and interrelationships that support this flexible and adaptable addition to the Ontario health care system. Complexity science provides insights that could not have been reached when only using the traditional explanatory model based on scientific positivism that describes the linear cause-effect relationship between two isolated events (34, 35). Furthermore, CAS was helpful in offering potential solutions and routes for ongoing development of PA integration. By recognizing that the success of PA role integration is largely contingent on relationships and interconnections, removing structural boundaries between professionals, aligning their goals, enabling adaptation and experimentation, and establishing simple rules to minimize expenditures (12), will help optimize the PA role and its sustainability.

Strengths and limitations

The multiple-case study approach allowed for the exploration of relationship patterns, interactions, and processes, and was essential to understanding the successes and challenges of PA role integration within complex adaptive systems. By using a case study approach with attention to relationship patterns, study results are richer and may afford more opportunities for potential interventions (15). As more than one case was studied, multiple successful patterns of PA role integration were identified, providing examples of self-organization and similarities in a variety of healthcare settings.

One limitation regarding use of complexity theory is variability in the application of core CAS principles which may lead to conceptual confusion (36). This limitation did indeed lead to challenges in the operationalization of complexity theory within this research study, as multiple resources reference slightly different principles or features (34, 36-41). However, the methodological approach of iterative coding and thematic analysis within

and between cases, in addition to application of complexity theory, allowed for the identification and refinement of the CAS features most relevant to participant experiences.

Additionally, this research focused exclusively on settings where PA role integration was deemed a success. Case selection targeted PAs that had been employed for at least 2 years, which means the study design did not capture settings where the PA role had been terminated due to system or funding issues. The recruitment of successful, well-functioning PA role integration was partly balanced by participants disclosing negative experiences in previous practices or during their initial implementation. Finally, this study had very limited participation from other non-physician health care providers and did not directly elicit patient satisfaction.

Recommendations for practice, policy and research

Multiple studies echo the importance of determining the appropriate level of regulation and funding support to fully realize the utility of PAs and to optimize their integration (3, 6). In addition, the lack of policy around reimbursement and incentives means that existing payment incentive mechanisms and the legacies of past policies are driving various stakeholders to pursue divergent interests (i.e., physician interests – save time, optimizing their income/reimbursement; increase patient access to care vs. PA interests – to be valued and acknowledged, improve patient experience, negotiate level of autonomy, etc.). The current policy vacuum sets up a system that has the potential for PAs to be taken advantage of as they constantly “need to prove their value” in order to have achieve sustainable employment. Health professional roles are shaped by professional regulations, organizational routines, and interpersonal relations, and therefore give rise to unforeseen events (40). In addition, misalignment at any point in the system to accurately predict how a policy will be implemented, can lead to precarious success or policy (i.e., role integration) failure (42).

To help guide future policies and avoid unanticipated consequences, policy makers should approach health care as a complex system (12, 14) and proactively think about the likely effects and full range of actors and stakeholders (43). Being more deliberate about exploring patterns and relationships around role integration will lead to improved interventions, particularly around reimbursement models and policy changes that promote effective coordination and communication amongst providers (10). Establishing a regulatory body, re-examining current government physician reimbursement models, competitive salary structures, and minimizing perverse incentives will all contribute to PA role optimization. From a practice perspective, PAs and interested employers should continue to voice their successes and challenges. PA enthusiasm, flexibility, and adaptability should be nurtured and supported in healthcare settings, especially where high-physician turnover, patient volume, and teaching requirements challenge collaborative and interprofessional care opportunities.

Conclusions

This study explored and identified key factors that support or restrict the optimization of PA role integration across multiple case settings in Ontario. The exploration of PA contributions across various health care settings, the importance of role awareness, supervisory relationship attributes, and role vulnerability (in relation to sustainability and funding) are interconnected and dynamic in surgical, inpatient, emergency department and family medicine settings. These findings represent the experiences and perceptions of physician assistants, physicians, and other healthcare providers (i.e., nursing, administrators) and demonstrate how the PAs willingness to work and ability to define their roles within existing structural frameworks allows for the establishment of interprofessional collaborative person-centered care. The individual determination of practitioners to make it work was crucial for role success in light of numerous challenges posed by system structures at policy and practice levels.

The exploratory design of case study research allowed for the identification of similarities and differences across a variety of Ontario healthcare settings that employ PAs.

Complexity theory was particularly helpful for studying the PA role within dynamic relationships, adaptable interactions, and unpredictable health care settings. PAs are playing a vital role in the delivery and support of healthcare within a multitude of settings as adaptable and collaborative team members focused on person-centered care. As the PA profession continues to expand into new jurisdictions, findings from this study help fill existing knowledge and practice gaps regarding the role of PAs. Documenting the central role of PAs will continue to inform the design and dissemination of research in order to optimize health care system efficiencies through PA integration.

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Table 1: Characteristics of Case Settings and Embedded Sites

| Multiple Case Study Settings | | | | |
|-------------------------------------|---|---|--|---|
| | Case 1: Family Medicine | Case 2: Emergency Medicine | Case 3: General Surgery | Case 4: Inpatient Medicine |
| Embedded sites | 6 Family Practices; Mix of urban (5) and rural (1); mix of academic (4) and non-academic practices (2). | 6 Emergency Departments; Mix of urban (4) and rural sites (2), mix of academic (5) and non-academic hospitals (1) | 5 Hospitals; mix of rural/non-academic (1), and urban/academic hospitals (4) | 3 Hospitals; All urban sites, all academic hospitals (3) (Cardiac ICU and Internal Medicine) |
| Interview Data | Semi-structured Interviews (15); 7 PAs, 7 Physicians, 1 Clinic Manager | Semi-structured Interviews (13); 7 PAs, 5 Physicians, 1 RPN | Semi-structured Interviews (12); 5 PAs, 3 Surgeons, 2 Surgical Residents, 2 IP Directors (MD, RPN) | Semi-structured Interviews (5); 4 PAs, 1 Physician |
| Document Data | Documents: medical directives, integration tool kits, HFO website/communications, Patient's First Document, 2011 College of Family Physicians of Canada position statement on PAs | Documents: medical directives, job postings, HFO website/communications, organizational websites, media/news | Documents: medical directives, job postings, HFO website/communications, organizational websites, media/news; OHA position statement on PAs; surgery department handbooks | Documents: medical directives, HFO website/communications, organizational websites; OHA position statement on PAs |
| Description of PA role | Certified Canadian (civilian and military) and US trained PAs with 2-9 year of family medicine experience at the time of data collection. | PAs were all Canadian Certified (CCPA) and had been practicing in Emergency Medicine for 4-9 years at the time of data collection. | PAs were all Canadian Certified (CCPA) and had been practicing in General Surgery for 2.5-5.5 years at the time of data collection. | PAs were all Canadian Certified (CCPA) and had been practicing at their hospital site for 2-5.5 years at the time of data collection. |
| PA-MD supervisor relationship | PA/MD work collaboratively, often in parallel. Relationships are longitudinal. PA usually supervised by 1 primary physician. | PA/MD work in same general department, but might be assigned to different areas to different patient cohorts (i.e., triage or assigned different CTAS level patients). PA works with multiple supervising physicians. | PA/surgeon work in same department, but surgeon often in OR. PA present on the ward and for consults within the ED and hospital. PA works with multiple rotating supervising physicians. PA is continuously available. | PA/MD work in same department, but may divide patients between team or may be assigned different tasks. PA works with multiple supervising physicians, so becomes centre of continuity. |

Table 2: Summary Table of Themes from Cross-Case Analysis

| CROSS-CASE THEMES AND PATTERNS | |
|---|--|
| 1. Contribution to Ontario Health Care Settings | |
| <ul style="list-style-type: none"> • Idea of a versatile, flexible, responsive, accessible health care provider that models collaborative, interprofessional care (stemming from foundation of core professional competencies)(+) • Focus on person-centered care – nature of the role allows for time, education and advocacy on behalf of patients (+) • Patient navigator – navigates community resources, hospital resources, other services, etc. (+) • Increase access to care – allows for increased patient volume, decreased wait times, same day appointments, faster consults, timely discharges (+); Fill gaps/bridging gaps in the health care system (+) • Significant impact on improving continuity of care (+) • Leadership & support – mentorship of learners, support residents, interest in research opportunities, quality improvement initiatives, other committee work, etc. (+/-) • Cost of the role; organizational role (+/-) | |
| 2. Developing Role Awareness & Role Clarity | |
| <ul style="list-style-type: none"> • Presence of a PA advocate or champion (+) • Challenge of working as an unregulated health care provider (lack of regulation); understanding of delegation, controlled acts and use of medical directives (+/-); Knowing when to seek help, knowing what you don't know(+) • Trajectory of role development: how PA or role was initially introduced; PA transition to practice; PA establishing role and functioning effectively (learning curve) (+/-) • Access to resources/supports (administrative, physical space, CPD funding/time) (+/-) • Navigating role and work environments amongst residents (especially in academic centres); how PA role is introduced to a learner, i.e., medical students, residents, etc. (+/-) • Heavy reliance on PA to deliver services; role evolution (+/-) • Organizational support; level of autonomy; influence of patient satisfaction (+/-) • Incentives (financial, time, support) to provide administrative, teaching or mentorship to medical students, residents, or PA learners (-) • Other healthcare professions not understanding role, not accepting orders, interprofessional relationships (-) • Concept of “caregiver creep”: PAs don't have an individual or MD-associated billing number, blood results ordered by the PA go back to the physician provider rather than the PA, even if the PA has been regularly seeing patient. Leaves providers feeling as though they have lost their role as care provider (-) • Lack of evaluation processes (performance, patient flow, productivity)(-) | |
| 3. Supervisory Relationship Dynamics | |
| <ul style="list-style-type: none"> • Nature of supervisory relationship allows PA to learn from a variety of practitioners – PA is exposed to variety of practice styles, personalities, bed-side manner, medical expertise, other consulting services, etc. (PA can adapt their own practice style by observing others, determine what works best for their own setting/clinical environment – echoed across settings where multiple supervising physicians are part of daily practice)(+) • Role of trust and mutual respect, defining entrustment, presence of PA frees up physician for other patients/cases (+) • Mutual support/resource: PA develops skill set that extends Physician services, or PA becomes the procedure or content expert due to frequency of exposure and clinical experience (+) • Mutual learning curves: PA orientation to clinical setting, procedures, physician preferences; Physician orientation to working with a PA (+/-); Physician experience, PA background (training, specialty interest) (+/-) • Feeling alone, lack of supervisory oversight (-) • Physician knowledge of oversight and liability (-) | |
| 4. System Variability and Sustainability | |
| <ul style="list-style-type: none"> • Potential disconnect being the physician supervisor +/- employer that has implications on sustainability of role, vulnerability of PA role, and PAs ability to negotiate for equal/more pay (+/-) • Navigating an unknown future; need to appropriately shift resources (+/-) • Variable remuneration for additional responsibilities (i.e., teaching, mentorship, QI initiatives, research)(+/-) • Inconsistent funding models, funding sources, salaries, benefit packages, and hourly rates; Lack of clarity around funding sources, streams, and opportunities (-) • Poor responsiveness to cost of living standards, stagnant salaries (-) • Concerns about “gaming the system”; double billing (-) • Lack of PA specific management or advocacy for contract negotiations and role sustainability (-) | |

Impact on Role Optimization (+ or -)

Negative impact (-): identified factor or process negatively impacts role optimization (is a challenge or barrier)

Positive impact (+): identified factor or process positively impacts role optimization (facilitates or supports role optimization)

Factor is neutral (+/-): Neutral in some circumstances, it can act as a barrier; in other settings, it is a facilitator

Figure 1: Schematic of Multiple-case Design with Embedded Subunits of Analysis

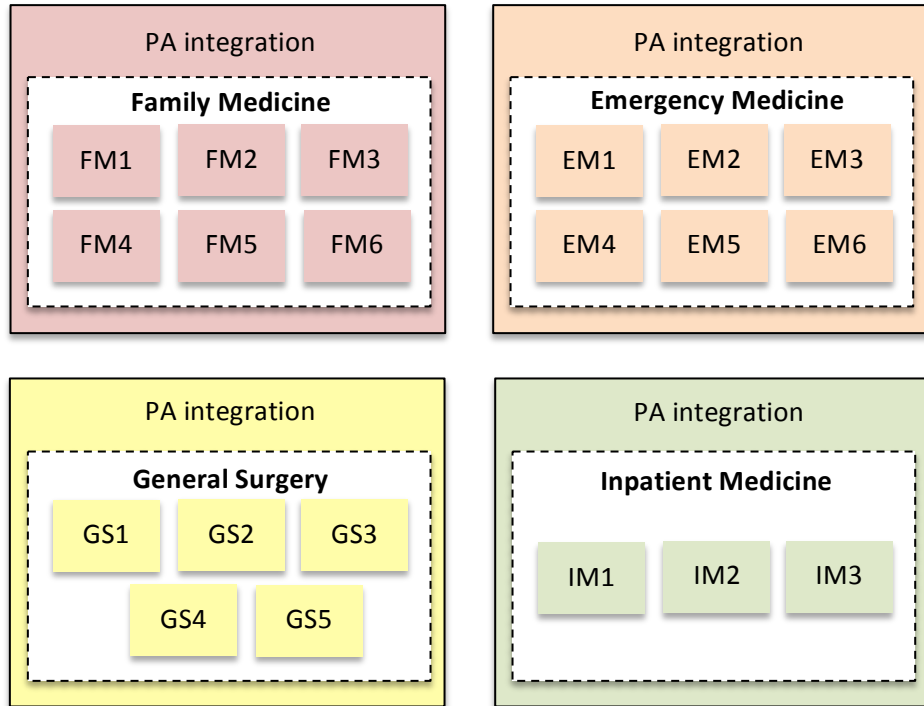
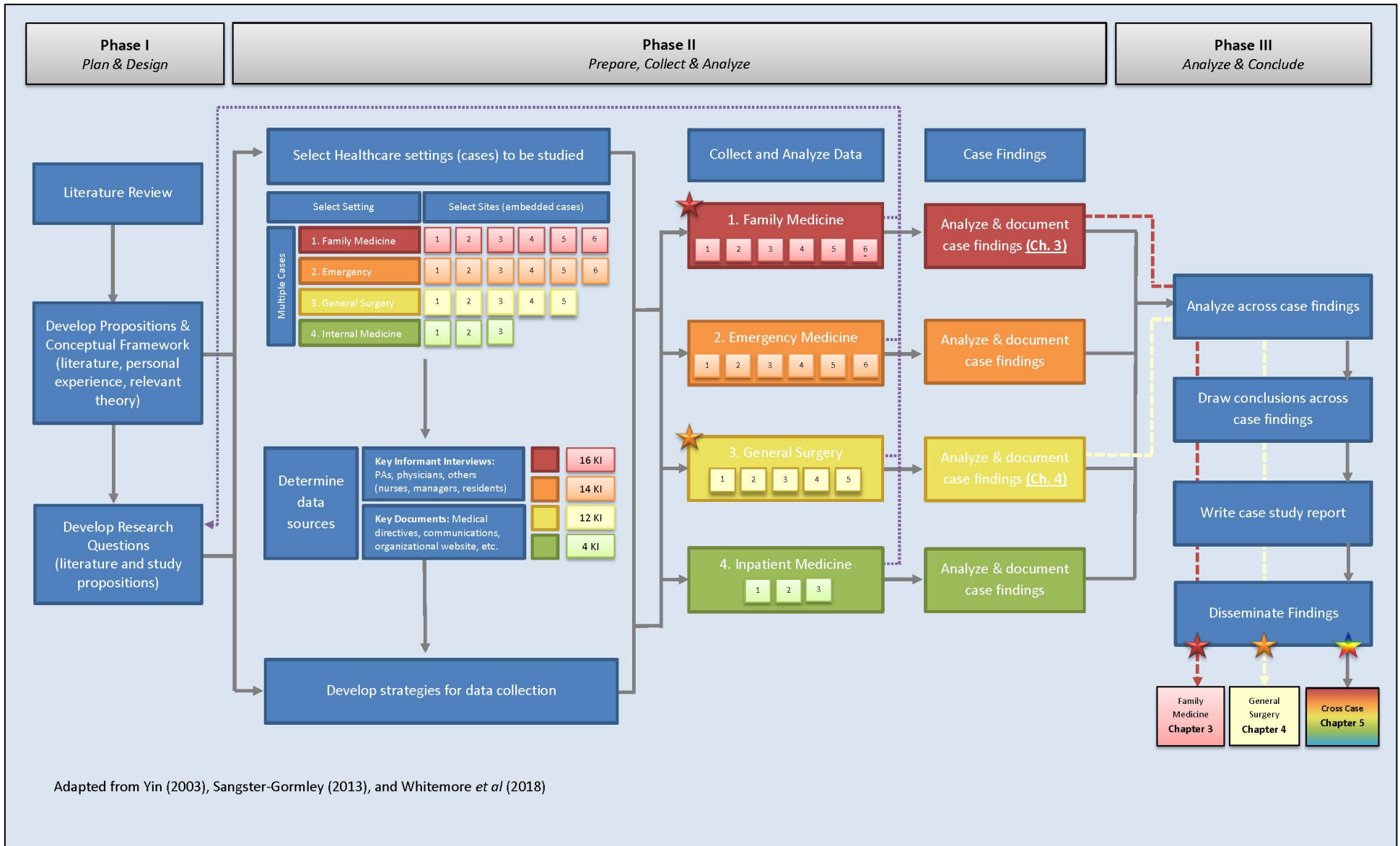


Figure 2: Summary of Within-Case Analysis (overarching themes within each case)



Figure 3: Overview of Multiple Case Study Design & Approach



Adapted from Yin (2003), Sangster-Gormley (2013), and Whitemore *et al* (2018)

CHAPTER 6: CONCLUSIONS FROM THE EXPLORATION OF PHYSICIAN ASSISTANT ROLE INTEGRATION IN THE ONTARIO HEALTHCARE SYSTEM

Conclusions

The three research chapters presented in this dissertation contribute to an increased understanding of the roles of PAs, the perceptions of other health care providers' about PAs, and the barriers and facilitators to PA integration across four different settings. This final chapter provides an overview of the principal findings from this multi-case dissertation through a summary of their practical, methodological and theoretical contributions, strengths and limitations, suggestions for future research, and global implications for policy and practice.

“Healthcare in the new millennium is being remapped. The challenge for [health care providers] is in making sure we learn the language required to not only read the map but assume an active role in the cartography itself”

~Adapted from Cary A. Brown (1)

Principal findings

The success of PA role integration is multi-factorial, dynamic and complex. Collaborative relationships, personal experience, negotiation of autonomy, mutual trust, opportunities for growth and mentorship, and patient satisfaction were repeatedly identified by study participants as key determinants of successful PA role integration. Barriers to role integration included PA dissatisfaction with salary and benefits, funding/billing challenges, physician/employer knowledge of liability insurance requirements, lack of role clarity and resistance from other health care providers.

The integration of PAs in the included cases reflects motivation from the PA, physician, clinic or health organization to create a collaborative team practice, improve patient access to care, and to creatively work around or overcome the identified barriers. Complex adaptive systems theory, collaborative and interprofessional care frameworks,

and implementation literature were all helpful tools to explore the patterns of relationships and interactions identified in the preceding chapters.

In chapter 3, I presented findings specific to the role of PAs in family health teams (i.e., primary care settings) which highlighted *professional* and *practice* based factors that have facilitated the provision of person-centered care, and allowed for the identification of *policy* challenges that could be ameliorated by clear guidance from a government agency or health professional regulation. The identified barriers and facilitators within family health teams aligned well with other implementation and collaborative care research, and highlighted the interactional determinants (i.e., personal/partnership factors), organizational determinants (i.e., practice/site factors), and systemic determinants (i.e., policy/provincial factors) impacting PA role success (2).

Findings from general surgery settings are presented in chapter 4. In this chapter, I identified three interrelated themes: PAs are flexible care providers who are willing and able to assume required tasks; PAs play an important role in improving continuity of care; and PAs play a significant role in facilitating interprofessional collaboration within surgical settings. Central to the PA role is their ability to navigate role uncertainty by demonstrating their skill set (including communication skills and medical expertise) and role enthusiasm. The characterization of “who PAs are” as health professionals sets the foundation for “what PAs can do” in surgical settings, demonstrating a dynamic interplay between what the PA brings to the setting and how they identify opportunities to coordinate the provision of patient care and improve service gaps.

The multiple-case study, as presented in chapter 5, generated cross-case themes that helped identify the various barriers, facilitators and systemic factors that impact PA role integration in family medicine, emergency medicine, general surgery and inpatient medicine settings. Results from the cross-case analysis establish a foundation for understanding how the PA role contributes to Ontario health care settings, the

importance of developing role awareness and clarity, the dynamic supervisory interface between physicians and PAs, and the impact of system variables on role sustainability and optimization. In addition to broad cross-case findings, this multiple case study allowed for a detailed analysis within each case.

Thesis contributions

Practical contributions

This thesis examines the role of PAs in range of health care settings in Ontario and provides a foundation for future research. The PA role was introduced in Ontario over thirteen years ago, but continues to be limited by a lack of research supporting the role. By seeking to understand the central role PAs play in a variety of health care settings, my research helps elucidate the many ways PAs can contribute to the provision of person-centered care, and provides lessons for other settings or jurisdictions interested in integrating PAs. The acceptance of PAs related to a number of dynamic professional, practice based and policy factors that allow PAs to contribute to collaborative and interprofessional care, regardless of practice setting. More broadly, my thesis explicitly identified the diversity of patient and operational needs that can be addressed by the PA role, including outcomes generated at the practice level in terms of organizational effectiveness and service provision. In addition, this research substantiates the impact of PAs in improving access to care and continuity of care in the Ontario healthcare system.

Methodological and theoretical contributions

The case study approach allowed for the exploration of relationship patterns, interactions, and processes, and was essential to understanding the successes and challenges of PA role integration within complex adaptive systems (3). The case study method is appropriate for this study as health professional role integration is complex, context dependent, and involves social processes. This method allows for the in depth exploration of setting specific contextual factors, the identification of consistent factors by analyzing across

cases, and for knowledge to be developed about how and why some events and situations affect others (4). Complexity theory, as understood in the context of PA role integration in the complex adaptive system of Ontario healthcare organizations, was a useful companion to the case study methodology. Complexity theory concurrently focused attention on the emerging relationship patterns and interactions among the system's agents and provided well-defined principles to explore the complex settings in which PAs are employed (3, 5).

Methodologically, the case study approach allowed for increased generalizability and transferability by increasing sampling to including multiple cases. This feature also increased construct validity, and decreased potential problems with contextual variation through insightful use of multiple cases and sources of data. It is anticipated that the methods outlined in this dissertation can be applied to different settings and different healthcare professions, assuming similar contextual factors.

With respect to theoretical contributions, this research provides specific and novel examples of where the exploration of PA role integration aligns and supports existing theories around health innovation, implementation literature, complexity theory, collaborative and interprofessional frameworks, and principles of person-centered care. Similar to the advantages of taking a CAS approach, each of these theoretical contributions provides us with a starting place to study and reform the healthcare system as an integrated whole (3).

Strengths and Limitations

Within Canadian physician assistant literature, this dissertation is novel in its design and contributions. By exploring the role of PAs across multiple settings, the multi-case study approach generated a substantial volume of data pertaining to individual sites, settings and organizations, in addition to being the first multi-site Canadian study to identify cross case themes and to explore outliers. Given the lack of existing research, study

propositions were grounded in my personal experience as a PA, evidence from other jurisdictions, and grey literature.

In order to minimize bias, a number of methods were used to strengthen the study protocol including: member checking (e.g., family medicine results were circulated to participants to ensure congruency), triangulation (e.g., coding and emerging themes were identified and discussed by multiple researchers), and by establishing trustworthiness. Reliability and validity were fostered through the use of a case study protocol, using multiple sources of evidence, establishing clear chains of evidence, explanation building, pattern matching, and addressing case outliers (6). In addition, specific case study strategies such as establishing credibility, transferability and confirmability, were used to address trustworthiness (7). Creditability was developed through multiple approaches, including peer debriefing, triangulation of data sources and researcher coding, and through the analysis of negative cases (outliers). Descriptive explanation building was used to facilitate the transferability of the research findings (e.g., descriptions and experiences are put into context so that they are meaningful to an outsider or can be transferred to other settings) (8). Finally, dependability and confirmability were optimized through the use of a log (audit trail) to ensure that research protocols and decisions are transparent.

I was uniquely situated as a PA and education program administrator to access a number of political, organizational, academic and professional networks that allow for a strong discourse between emerging research findings, policy reform, and contributions to PA education. However, the “insider” perspective is also a limitation. It is possible that I didn’t probe for further explanation to certain comments because I presumed I knew what the interviewee meant, and it is possible I did not.

Although the multiple-case study approach is a strength, there are limitations to this study design in the context of PA role integration. It was difficult to construct boundaries or limits around the cases of interest. PAs are currently employed in a multitude of settings

in Ontario, and limiting the multi-case study to only four cases requires transferability of study findings to other settings to be interpreted with caution. Additionally, the volume of data generated by multiple case studies is substantial. Emphasis is placed on reporting broad themes and categories, which takes away from an in-depth analysis and discussion around outliers and cross-case inconsistencies. Case study findings are not meant to be generalizable outside of the context they were examined in (9), and complexity theory studies are often difficult to generalize due to heterogeneity and variation in reporting (10). However, as demonstrated by other health services work, using CAS theory helped strengthened the credibility of findings and suggests their transferability within the Ontario context of PA integration.

Despite efforts to recruit research participants from non-medical professions, very few of these perspectives were represented in the data. It was particularly disappointing to have so little participation from other health care professions. Although I believe this reflects the complex and busy settings in which most health professionals are employed, the lack of other health provider perspective on the PA role limits the study findings. Additional contributions from other health care providers is especially pertinent given the comments from physicians and PAs about working closely with other professionals, and the potential for tensions around role clarity or role resistance. Within a similar context, patient and family perspectives would have also strengthened study findings and provided important feedback from the most central stakeholders in healthcare delivery. However, reflecting on each limitation does highlight opportunities for future research and helps identify specific groups, settings, and organizations that should be targeted for feedback on the role of PAs in the Ontario healthcare system.

Personal reflections

My own personal experience as a hospital-based physician assistant and an academic program administrator was both a benefit and a challenge throughout this research study. Navigating the healthcare system, being aware of PA networks, opportunities for diffusion of research findings, and access to data was relatively easy to circumnavigate because of my experience and current role. My position, and the knowledge and experiences that it has offered me, enabled me to clearly identify gaps in current knowledge around the PA role in Ontario, and to develop specifically tailored research questions to address these gaps. In many cases, it was easier to connect with participants as I had my own first-hand experience and understanding of the PA role.

However, my own role experience also made some of the interviews and global analysis challenging. There were a few supervising physicians who verbalized misinformation regarding PA education programs, or incorrect pieces of information that were not aligned with current literature. It was difficult to avoid trying to correct this misinformation and required considerable time reflecting on the interview experience upon completion. In addition, I knew many of the study findings anecdotally, and data analysis required me to take extra efforts to ensure that I employed a conscientious, iterative approach to ensure the developing themes and categories were emerging from the participant's voice and not from my own experience. The case study approach also helped ameliorate these challenges through the design of a rigorous protocol that allowed me to be conscious of my own experiences while embedding myself in the context of participant experiences. It was a humbling experience and a privilege to interview these individuals in an effort to shed light on the exceptional work being done by Canadian and US trained (both military and civilian) PAs within our healthcare system.

Implications for policy, practice and future research

These findings provide insight into the role of PAs across various Ontario health care settings. Results from this study will help refine existing PA hiring toolkits and integration

blueprints, and will be disseminated to the Canadian Association of Physician Assistants. In addition, the anticipated journal publications from each research chapter and the forthcoming health professions textbook publication of the introductory chapter will significantly contribute to the limited body of literature regarding Canadian PAs. This contribution to Canadian research evidence will help revive provincial efforts to support health system stakeholders in creating sustainable programs to optimize the role of PAs in health care delivery.

A lack of policy in many ways has allowed PAs to be flexible and adaptable health care providers who can fill gaps through their skill set and competencies. Without fixed provincial funding models or regulatory status, PAs must tirelessly demonstrate their competencies and contributions in order to maintain their employment and to prove their value, and their advocates must constantly seek creative workarounds. Unfortunately, this same lack of policy around financial reimbursements and incentives means that existing mechanisms of payment and policy legacies are driving various stakeholders to pursue divergent interests. For example, physicians may be interested in saving time, decreasing their workload, increasing patient access to care, or optimizing their income. PA interests may include wanting to be acknowledged and recognized, and to negotiate some autonomy. Ultimately the value misalignment between stakeholders, especially in the context of complex adaptive systems, means various agents have different beliefs about who PAs are and what value they add to patient care.

The decision to integrate a PA may come from an individual physician, a department or clinic, or broader organizational decisions, which complicates PA role integration, funding, oversight and management. Instability in funding and lack of regulatory models makes it difficult to establish a strong quantitative research foundation given the variability of practice environments and potential for PA turnover. However, the results of this dissertation highlight a number of opportunities for future research: the importance of

tracking outcomes of interest; assessing patient satisfaction and willingness to receive care from a PA; and quantifying the efficiencies and economic benefit of the PA role.

Future research should continue to build on PA, NP and other literature around tracking specific outcomes of interest within a variety of settings. In hospital settings, indicators such as such as quality of care, length of stay, patient outcomes, complications, readmissions, and other economic outcomes (i.e., cost savings) should be captured in clinical settings when a new health professional role is introduced. Indicators such as patient satisfaction and willingness to receive care from a PA, reduction of hospital visits, and tracking delegated tasks (i.e., PA performing well baby exams in family practice settings, or PA being the surgical first assistant in the OR) would strengthen the evidence base about PAs.

While health professional perceptions are favorable regarding the impact PAs have on patient care experiences, future research should directly engage patients and their families to explore their feedback on the PA role. Additional patient engagement around the PA role should be pursued in provinces that have already integrated PAs, or are considering their introduction to ensure feedback guided by information from all stakeholders. Finally, the economic impact of the PA role needs to be quantified. Participants touched on the benefit of PAs as lower-cost alternatives to other health care providers, but very little economic modeling or forecasting has been done regarding the role of PAs. With a richer understanding of the roles PA play in a variety of health care settings, future research can focus on cost-savings and efficiency outcomes.

While the use of the qualitative case study methodology was an excellent fit for my overarching research questions, navigating the significant amount of data derived from this approach was often overwhelming. Setting parameters around where to focus the analysis, selecting the most pertinent study findings, and situating the existing literature required considerable energy, reiteration, time, and reflection. This rich data set provides

many opportunities for future manuscripts, including an exploration of PA competencies and skill sets, professional self-identification, examining continuing professional development requirements of PAs, exploring physician and PA perspectives on PA/medical education and training, and factors that influence and define the supervisory relationship.

Implications for professional practice and Physician Assistant education

As identified in the reflexivity portion of this dissertation (chapter 2 and chapter 6), situating myself as a PA and administrator of a PA education program provides one final layer by which the findings of these collective studies can be applied. The theories and themes developed throughout this study and in health professional literature provide helpful context for the training and education of PA students and practicing PAs. Practicing PAs will benefit from rich role descriptions and literature that supports their experiences in the healthcare system. For example, educating employers and PAs about continuing professional development requirements and the importance of liability insurance will ensure supports can be developed for ongoing PA medical education opportunities, and to ensure that PAs and employers are protected from a liability perspective.

This research highlighted a number of important concepts that would lend themselves well to curriculum integration. Having an opportunity to demonstrate what successful roles look like, and being able to identify where PAs are contributing the most value to the Ontario healthcare system is a significant benefit to students and new graduates. Similarly, identifying professional challenges and integrating them into the PA curriculum gives students an opportunity to learn how to navigate these issues when the stakes are low (i.e., employment is not at risk) and mentorship is available. Finally, PA participant interest in clinical education and teaching roles will help foster ongoing program faculty development to build the skill set and competencies of PAs interested in formalized teaching opportunities.

Concluding Statement

Overall the findings from this multiple case study are important from a broad systems perspective as the results help fill existing knowledge and practice gaps regarding the role of PAs, and will help inform the design of human health resource research in order to optimize health care system efficiencies. This is an exciting and opportune time for health services research around PA integration as the profession continues to expand nationally and internationally.

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APPENDIX I: DOCUMENT DATABASE OVERVIEW

| Document Source and Type | Examples in Document Database |
|---|---|
| Competency Frameworks and Standards | CanMEDS 2015-PA Competency Framework ARC-PA (US) accreditation standards for PA education CMA accreditation standards for PA education CIHC Interprofessional Competency Framework |
| Medical Directives | Family Medicine settings, Emergency Medicine Settings, General Surgery, General Internal Medicine, and Cardiac Intensive Care Unit |
| Position Statements on Physician Assistants | Registered Nursing Association of Ontario College of Nurses of Ontario Ontario Hospital Association College of Family Physicians of Canada Ontario Medical Association College of Physicians and Surgeons of Ontario |
| Application for Health Professional Regulation (Ontario) | Jurisdictional Review Jurisprudence Review Application for Regulation Volume 1 & 2 Minister’s letter |
| Government documents/ websites pertaining to PA profession | HealthForceOntario Ministry of Health and Long Term Care Government of Ontario Patient’s First Act HFO Health Human Resources Toolkit |
| Hospital and Health Organization Websites | Organizational announcements pertaining to introduction of PA role PA Advocacy, celebration of National PA Day Health Professional role descriptions |
| Job Descriptions | Captured from PA employers and organizations Indeed Job Bank CAPA Internal Job Postings (archived and recent) |
| PA Integration Toolkits | Ontario Family Medicine Blueprint OHA/OMA PA Toolkit |
| Health Professions Act/ Medical Acts | Reviewed from Nova Scotia, New Brunswick, Manitoba, Alberta |
| Documents created by PAs | General Surgery Resident Handbook Family Medicine Blueprint for Employing a PA |
| Reports | Conference Board of Canada Reports Ontario PA Implementation – Evaluation Subcommittee |
| Social Media | Publicly available twitter feeds, Canadian PA blogs, YouTube channels pertaining to PA practice in Ontario |

APPENDIX II: HIREB INFORMATION LETTER AND CONSENT FORM



PARTICIPANT LETTER OF INFORMATION/CONSENT

A Study of the Factors Impacting Physician Assistant Integration into Clinical Settings

Principal Investigator:

Dr. Meredith Vanstone is the principal investigator of this study. She is a faculty member in the Department of Family Medicine at McMaster University and is the supervisor of the student investigator.

meredith.vanstone@mcmaster.ca, 905-525-9140 x22113

Student Investigator:

Kristen Burrows is a PhD student in the Health Research Methodology PhD program.

burrowk@mcmaster.ca, 905-525-9140 x21557

Co-Investigators:

Dr. Julia Abelson is a Professor in the Department of Health Research Methods, Impact & Evaluation at McMaster University.

Dr. Mitch Levine is a Professor in the Department of Health Research Methods, Impact & Evaluation at McMaster University.

Dr. Patricia Miller is an Associate Clinical Professor in the Department of Rehabilitation Science at McMaster University.

You are invited to take part in this study examining the factors that impact the integration of Physician Assistants in primary care settings because you are a physician assistant or you work with a physician assistant in a primary care setting. In order to decide whether or not you want to be a part of this research study, you should understand what is involved and the potential risks and benefits. This form gives detailed information about the research study, which will be discussed with you. Once you understand the study, you will be asked to sign this form if you wish to participate. Please take your time to make your decision. Feel free to discuss it with your friends and family.

Why is this research being done?

The goal of this study is to identify the factors that impact the integration of Physician Assistants. This study will examine your personal experience regarding PA integration, both through barriers and facilitators.

What will my responsibilities be if I take part in this study?

If you volunteer to participate in this study, we will ask you to do the following:

If you choose to participate in this study, you will be asked to participate in one face-to-face interview that will take approximately 45 minutes. The interview will be audio recorded and later transcribed verbatim.

The interview will be arranged at a mutually agreeable time and place, preferably in an area with low noise and privacy. A second follow up interview may be required at your convenience.

How many people will be in this study?

We anticipate that up to fifteen people will be involved in this study.



What are the potential harms, risks or discomforts?

There are no anticipated risks or discomfort associated with your participation in this study. You do not need to answer questions that make you feel uncomfortable or that you don't want to answer. You can end the interview at any time or completely withdraw from the study at any time. I will take the steps outline below to protect your privacy.

What are the potential benefits for me and/or society?

Although this research may not benefit you directly, it is anticipated that the results from this study will contribute to establishing a foundation of Physician Assistant research in Ontario. I hope that different stakeholders, especially those in control of Physician Assistant funding, can use this research to make research driven decisions regarding the integration of Physician Assistants in Ontario.

How will information be kept private?

To protect your privacy, any identifying information (including your name) that appears in the transcript of the interview will be removed and replaced with a non-identifying placeholder.

Consent forms, interview audio recordings and materials with identified information will be kept in a secure setting. The electronic materials will be stored on a password-protected computer in a locked office at McMaster University. Paper copies of study materials, including study materials and shared documents, will be kept in a locked drawer in the student investigators private office. The transcripts and audio-recordings will be destroyed ten years following the completion of the study. Electronic data will be deleted using a process approved by the research ethics board. The paper data will be shredded using a confidential shredding service.

Can participation in the study end early?

Your participation in this study is completely voluntary. If you wish to withdraw from the study you can do so at any time for any reason with no consequences to you. If you wish to withdraw from the study, please email the student investigator (Kristen Burrows, burrowk@mcmaster.ca). If you do not want to answer some of the questions during the interview, you can do so and still be in the study. Please note, once you have completed an interview, it may not be possible to remove your information from the analysis. However, no direct quotes will be used from your data.

Information about study results:

I expect to have this study complete by December 2018. If you would like a brief summary of the results, please let me know how you would like it to be distributed to you.



Questions about the study:

Any questions regarding this study or requests for additional information can be directed to:

Kristen Burrows
Health Research Methodology PhD program
McMaster University
905-525-9140 x21557
Email: burrowk@mcmaster.ca

Or my faculty supervisor at:

Dr. Meredith Vanstone
Department of Family Medicine
McMaster University
905-525-9140 x22113
Email: meredith.vanstone@mcmaster.ca

This study has been reviewed by the Hamilton Integrated Research Ethics Board (HIREB). The HIREB is responsible for ensuring that participants are informed of the risks associated with the research, and that participants are free to decide if participation is right for them. If you have any questions about your rights as a research participant, please call The Office of the Chair, HIREB at 905-521-2100 x42013.



CONSENT

A Study of the Factors Impacting Physician Assistant Integration into Clinical Settings

I have read the information presented in the information letter about a study being conducted by Kristen Burrows and Dr. Meredith Vanstone at McMaster University.

I have had the opportunity to ask questions about my involvement in this study and to receive additional details.

I understand that if I participate in this study, I may withdraw from the study at any time. I will receive a signed copy of this form.

I understand that once I have completed an interview, my information may not be able to be removed from the analysis. However, no direct quotes of my information will be used.

| | | |
|--------------|-----------|-------|
| _____ | _____ | _____ |
| Name & Title | Signature | Date |

Consent form administrated and explained by:

| | | |
|--------------|-----------|-------|
| _____ | _____ | _____ |
| Name & Title | Signature | Date |

I would like to receive a summary of the study's results.

Please send them to this email address:

Or to this mailing address:

| | |
|-------|-------|
| _____ | _____ |
| | _____ |
| | _____ |

APPENDIX III: SAMPLE INTERVIEW GUIDES

Interview Guide for Supervising Physician A Study to Explore Physician Assistant Integration into Ontario Hospital Settings

Interview Orientation

1. Do you have any questions before we begin?
2. Do I have your permission to start the recording?

Physician Background and Experience

3. How did you first hear about physician assistants?
4. How long have you employed or worked with a PA?
 - a. Can you describe the training/experience your PA brought to their role? (i.e., new grad, military, out of province, etc.)
5. Were you the person who made the decision to integrate a PA into your department?
 - a. If so, what prompted you to do this? If not, how did you react?
 - b. Can you describe any resistance or support regarding the PA role in your department/setting?
6. Did you have any previous experience working/employing a PA?
7. How did you feel when you first integrated the PA into your practice?

Currently PA Employer

8. How many PAs do you employ/supervise in your department? (*prompt: distinguish between how many they supervise directly and how many work in the department*)
9. Can you describe to me the role of the PA(s) in your department?
 - a. What are the PAs responsibilities? What do they do independently and what must they consult you about? How did you come to that understanding?
 - b. How long did it take for your PA(s) to be efficient in their role? (or how would you describe the learning curve in working with/integrating a PA?)
10. How would you describe the success of the PA role?
11. What are the challenges of employing/supervising a PA in this setting?
12. How would you describe your relationship with the PA? How do you work to improve this relationship? Is your relationship with the PA different than your relationship with other non-MD health professionals?
13. What are the benefits of working with a PA in a hospital setting/in your department?
14. How do your patients feel about being seen by/with a PA?
15. How do other staff or health care professionals (and who are they) feel about working with a PA?

- a. Is your PA part of an interdisciplinary care team?
 - i. If yes, can you describe the PAs role on the team?
 - ii. If NP part of team, can you describe difference/similarities between roles?
16. Does your clinic/setting have medical students or residents?
 - a. If yes, how do they feel about the PA role? What is their understanding?
 - i. How is the PA introduced or integrated?
 - ii. How do you distinguish the PA role from the role of a medical resident?
 - b. What kind of a role does the PA play in terms of mentorship/ teaching/ precepting other medical learners or students?
(if not currently done, do you see a role for the PA to do this?)
17. What do you think a PA needs in terms of continuing medical education?
(same/different than MD?)
 - a. What is your role as the supervising physician in maintenance and extension of PA competencies?
 - b. What are your expectations of the PA in terms of maintenance and extension of PA competencies?
18. What is your understanding about what is happening with PA regulation in the Province?
19. How is your PA funded? Does salary include benefits, CME time?
20. How is liability insurance covered for your PA?
21. In summary:
 - a. What are the barriers that impact the PA role?
 - b. What are some examples of where you feel the PA has the biggest impact?
 - c. What advice would you give a colleague or another department interested in hiring a PA?
22. Are there any other comments or feedback you would like to share? Are there any questions that you feel were missed during this interview that are relevant to the PA role or your experience with a PA?

End of Interview

Interview Guide for Physician Assistants
A Study to Explore Physician Assistant Integration into Ontario Hospital Settings

Interview Orientation

1. Do you have any questions before we begin?
2. Do I have your permission to start the recording?

Demographic Questions

3. What PA program did you graduate from?
4. What year did you graduate?
5. Are you a Canadian (or US) certified PA?
6. What was your background prior to becoming a PA? (education, experience)
7. What year were you born in?
8. How long have you been practicing at this hospital? Have you worked anywhere else as a PA? If yes, what other settings have you worked in and for how long?

PA Specific Questions

9. How did you come to be a physician assistant?
10. What drew you to this profession?
**if participant describes interest in medical school – follow up end of interview with question about now that they have worked as a PA, would they pursue medicine or would they opt to fast track if it was offered? (i.e., with x numbers of years of PA experience, could get into residency – why or why not?)*
11. Please describe to me what it means to you to be a physician assistant?
12. What is your role as a PA at this hospital?
 - a. Has your role evolved over time?
 - b. What core competencies do you think you need to be a PA in your current role? (prompts: *What do you need to know or be able to do in your current role?*) *Do you think this skill set would change in a different [health care] setting?*
 - c. What does your supervising physician entrust you with? (prompt: *what are your responsibilities? What do you do by yourself and what do you need to consult with your supervising physician about?*)
 - d. Does your hospital have medical students or residents? Can you describe how you interact with them? What is their understanding of your role?
 - e. Is teaching/mentorship part of your role? If yes, can you describe what role you play in teaching/mentorship/orientation? How are you supported to do this? If no, would mentoring/teaching be of interest to you?
13. Let's talk about when you first started at this hospital in your role...
 - a. How long ago was that? How were you introduced in your first few days?
 - b. Were you the first PA in this organization? In this area/department?
 - i. If yes, what was it like to be blazing the trail of a new profession? What kinds of work did you have to do to establish yourself?

- ii. If no, what understandings did the first PA establish? How were your colleagues prepared to work with a PA?
 - c. What have you learned about how to function effectively in your role since that time? (prompt: looking back, how long did it take to transition into your role? Learning curve?)
- 14. How do you describe your role to patients?
 - a. How do patients react to being cared for by a PA when you first meet them?
 - b. Does that change as you get to know them? (*note: may not be relevant in Emerg settings*)
 - c. What facilitates a good relationship with patients?
- 15. What would success in your role look like?
- 16. How many supervising physicians do you work with?
 - a. How would you describe the relationship with your supervising physician? What kind of work do you do together? What are the strengths and challenges of this relationship? How do physicians like working with you?
- 17. What's your interaction with other health care professionals like? What kind of work do you do together? What are the strengths and challenges of this relationship? (*prompt: are there other HC professionals interested in participating in this research?*)
 - a. If NP part of team, can you describe similarities/differences between your roles?
- 18. What are the challenges of being a PA in your particular hospital setting/ department?
- 19. What are the benefits of working as a PA in this setting?
- 20. What would you find beneficial in terms of continuing medical education? Accessibility/volume? What is most useful to maintain certification?
 - a. What role does your supervising physician play in terms of maintenance and extension of competencies?
 - b. What do you think your responsibilities are in terms of maintenance and extension of competencies?
- 21. What do you understand about what is happening with PA regulation? Do you think your role would change with regulation/what would change if you were regulated?
- 22. How are you funded? Are you satisfied with your current salary and/or benefits? If no, why not satisfied? (*prompts: What is included, do you get CME time/funding, etc.*)
- 23. Do you work under medical directives at your site? Who developed them?
- 24. How is your liability covered? Do you have individual insurance separate from hospital coverage?
- 25. Do you, your supervising physicians, or hospital collect data or indicators about the impact of your role?

26. In summary:

- a. Can you describe any barriers impact your role? (efficiency, sustainability, etc.)?
- b. Can you describe examples of where you feel you have the biggest impact?
- c. What advice or feedback would you give to a PA student or graduate looking to work in your setting/a similar setting to yours?

27. Any other additional comments or information you'd like to share? Are there any questions that you feel were missed during this interview that are relevant to your role?

End of Interview

Interview Guide for PA Manager or Hospital Administrator
A Study to Explore Physician Assistant Integration into Ontario Hospital Settings

Interview Orientation

- 1) Do you have any questions before we begin?
- 2) Do I have your permission to start the recording?

Administrator Background and Experience

- 3) To start, could you tell me a bit about your role in this organization? How long have you worked in the industry? At this location?
- 4) How did you first hear about physician assistants?
- 5) How long has your hospital/department employed a PA?
 - a. Can you describe the training/experience your PA brought to their role? (i.e., new grad, military, out of province, etc.)
- 6) Did you have any previous experience working/employing a PA, before one started working at this institution?
- 7) Were you the person who made the decision to integrate a PA into your department/hospital?
 - a. If so, what prompted you to do this? If not, how did you react?
 - b. Can you describe any resistance or support in developing/promoting the PA role?

Currently Employed PA

- 8) How many PAs do you employ/manage in your department/hospital?
 - a. What departments do they work in? With whom?
 - b. The PAs who currently work here- how long have they been here? Did you employ any other PAs before these individuals?
- 9) Can you describe to me the role of the PA(s) in your department/hospital?
 - a. What do you think the key tasks or responsibilities of the PA are? Is this the same as when you started employing PAs here?
 - b. Can you describe the learning curve for both the PA and staff working with a PA?
- 10) What are the benefits of a PA in your department/hospital? Can you provide some examples of where you feel the PA has the biggest impact?
- 11) What are the barriers that impact the PA role? What are the challenges of employing/managing a PA in this setting?
- 12) How do patients/community feel about being seen by a PA/PAs?
- 13) How do other staff or health care professionals (and who are they) feel about working with a PA?
 - a. Is your PA part of an interdisciplinary care team?
 - i. If yes, can you describe the PAs role on the team?
 - ii. If NP part of team, can you describe difference/similarities between roles?

- 14) Does your department/hospital have medical students or residents? If yes, how do they feel about the PA role? What is their understanding? How is the PA introduced or integrated?
- 15) What are your expectations around continuing medical education for PAs?
 - a. What is your role in maintenance and extension of PA competencies?
- 16) What is your understanding about what is happening with PA regulation in the Province?
- 17) How is the PA role funded? Does salary include benefits, CME time?
- 18) How is liability insurance covered for PAs in your hospital/department?
- 19) Do other hospital administrators support the PA role? If yes, how? If no, why not?
 - a. What advice would you give a colleague or another department interested in hiring a PA?
- 20) Are there any other comments or feedback you would like to share? Are there any questions that you feel were missed during this interview that are relevant to the PA role or your experience with a PA?

End of Interview