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Crossing the Technological Line :
Blood Transfusion and the Art and Science of Nursing, 1942-1990

by
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Thesis submitted to the
School of Graduate Studies and Research
in partial fulfilment of the requirements for the
degree of Master of Science in Nursing

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Abstract

Recent events in Canada have stimulated great interest in the topic of blood. While previous transfusion histories have focused on chronological narratives from medical and institutional perspectives, limited understanding exists regarding blood evolution and the associated technology. Little is known about the adoption of this technology; few studies have considered the social contexts within which it evolved; and no studies have examined the roles of the nurses who administered blood to patients. In the process of seeking professional and scientific status, nurses increasingly adopted the biomedical model with its associated technologies, yet neglected to develop and articulate the relationship between highly technical practice environments and their philosophy of caring. Current restructuring in health care now threatens to reduce nursing to a series of technical tasks which can be delegated to lowest cost providers. Historians are only beginning to explore questions related to nurses as 'shapers' or 'inheritors' of technology, as well as how nurses have taken on technological roles and for what reasons.

This thesis examined the process by which blood transfusion was incorporated into nursing practice at the Ottawa Civic Hospital after 1942. Oral history, archival sources, professional literature, and popular literature provided data for an analysis which used social history as the framework. Three themes emerged from the data, based on the manner in which nurses were involved with blood: the construction of knowledge related to transfusion; the manner in which transfusion complicated care giving; and the influence of changing work patterns on nursing expertise. Discussion was organized by three time periods: 1924-1949, 1950-1970, and 1970-1990. I have argued that nurses take on a variety of technological roles, incorporating them into practice, and transforming them. In doing so, the art and science of nursing became integrated and seamless--'knowing' and 'doing' became a unified whole. This study contributes to knowledge in Canadian history, medical and nursing history, women's history, and the history of technology-- through a complementary understanding of blood transfusion and nurses' roles in adopting medical technology.

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List of Abbreviations

Archives:

Bytown Musuem, Ottawa

City of Ottawa Archives, Ottawa (COA)

National Archives of Canada, Ottawa (NA)

Canadian Red Cross Society Archives, Ottawa (CRCA)

Ottawa Civic Hospital School of Nursing Alumnae Association Archives, Ottawa (OCHA)

Organizations and abbreviations:

HAR	Hospital Annual Report
OCH	Ottawa Civic Hospital
OCHSN	Ottawa Civic Hospital School of Nursing
GPH	County of Carleton General Protestant Hospital
CRC	Canadian Red Cross
St. Luke's	Saint Luke's General Hospital
LSI	Lady Stanley Institute for Trained Nurses
OMA	Ontario Medical Association
CPSO	College of Physicians and Surgeons of Ontario
RNAO	Registered Nurses Association of Ontario
CNO	College of Nurses of Ontario
OHA	Ontario Hospital Association
ICN	International Council of Nurses

Chapter 1

BLOOD TRANSFUSION AS A NURSING TECHNOLOGY

Introduction

The use and administration of blood is an example of a technology that was introduced and accepted into medical practice in Canada during the mid-twentieth century. Blood was promoted predominantly as life-saving and capable of solving a wide variety of medical problems. By the end of the twentieth century, blood transfusion has become a subject of controversy, legal challenges, and public distrust. Although there are celebratory histories written about organizations associated with blood and blood services, the social construction which has shaped this technology is poorly understood. There is limited understanding regarding the context and evolution of blood transfusion and its associated technology. Little is known about influences on related decision making processes. No research has examined nurses' roles related to blood transfusion.

Historical research since the 1970s has challenged traditional approaches to understanding the past¹ and suggested that knowledge is constructed through an interpretation of events and processes as shaped by a wide variety of influences. For this study, the lived experiences of health care workers (often expressed as the 'view from below'²) were accepted as equally valid with the views of the leadership elite. Technology was approached as a process rather than a product or discovery. As well, understanding technology as socially-constructed shifted the frame of reference to non-traditional data sources.

In his work on technology in American hospitals during the early twentieth-century, Joel Howell noted that "technology does not arrive at the bedside with its meanings already determined. . . ." and suggested that there are advantages in shifting our frame of reference away from the technology, toward the patient and the interaction with the health care system. He further suggested there is need to move away from a focus on published clinical literature which gives only one image, since it represents the perspective of educated, elite medical researchers and writers.³

Within the nursing hierarchy, the leadership often undervalued technological knowledge considering 'technical procedures' as mere tasks in contrast to meeting higher level holistic needs of the patient. Using blood transfusion technology as an exemplar or case study, I will argue that nurses take on a variety of technological roles, incorporating them into their practice, and transforming them by the development of knowledge around the applications. In doing so, the art and science of nursing are integrated and seamless—the knowing and the doing become a unified whole and thus the tasks of nursing care cannot be successfully separated from the body of knowledge. Based on the manner in which nurses were involved with the technology, transfusion can be divided into three time periods: a period of introduction, a period of delegation, and a period of incorporation. Across these three time periods, technology shaped and was shaped by nurses. They constructed new knowledge related to it and dealt with the manner in which it complicated patient care activities and the work environment. Changes in nurses' work patterns created a different work force at the bedside which facilitated the development of practice knowledge and the transfer of technology into their domain.

Scope and Objectives

This study examined the process by which nurses incorporated blood transfusion into nursing practice at the Ottawa Civic Hospital (OCH) during the period from 1940s to the 1990. Analysis illuminated the process by which current medical technologies are adopted and rejected. The study of this specific technology also provided insight to the state of nursing knowledge and nursing

practice in general. Since most nurses have been and continue to be women, the examination of a 'female' profession reflected trends in women's work lives as well. Thus, the research contributes to knowledge in the areas of Canadian history, medical history, nursing history, women's history, and the history of technology.

Concepts for analysis included: the art versus science dilemma in nursing, nurses' relationship to technology, the process of incorporating medical technology, and blood transfusion as a nursing technology. The following questions were asked: What was the state of nurses' knowledge related to blood transfusion before, during and after its implementation as a medical therapy in civilian populations? How did the theoretical knowledge imparted in nursing education compare with nursing practice in a hospital setting (ie. uses, procedures, practice expectations, documentation)? How and under what conditions did nurses incorporate blood transfusion technology into their practice? What were nurses' roles related to blood? Were there sources of resistance to the technology and if so, why?

The time frame from 1942 to 1990 is critical. Literature indicates that basic knowledge and techniques required for the collection and storage of blood existed by 1935. The first large scale demonstration of transfusion efficacy using blood products which had been stored, was documented during the Spanish Civil War, 1936-1939.⁴ Onset of World War II created further military demands for blood products. As the war drew to a close, transfer of the technology into the civilian population became feasible and medically accepted. Viewed as 'life giving', blood transfusion was an available treatment throughout much of Canada by the end of the 1940s.⁵ In hospitals and blood collection agencies, nurses were first introduced to the uses and techniques associated with blood products during this time. Over the next decades, knowledge and skills related to blood products were accepted as basic competencies required for entry to nursing practice.

Through these decades, the use of blood products steadily increased.⁶ By 1990, the association of fatal iatrogenic illnesses--such as hepatitis C and acquired immunodeficiency syndrome (AIDS) with blood products, had been creating alarm in both the health care and public

spheres for almost a decade.⁷ These growing concerns paralleled a reduction in blood use and increased research into alternative therapies.⁸ Although the transmission of infection through blood had been recognized earlier with malaria, syphilis, and hepatitis B, it was the linkage of AIDS and hepatitis C to policy decisions on screening and testing blood products that led to the changed perception of blood as "tainted"⁹, "filthy"¹⁰, and "the gift of death."¹¹

Through the 1980s, there were increasing numbers of controversies and legal challenges from consumers, families, and advocacy groups related to blood.¹² Early reports indicated that more than 1,200 persons contracted AIDS and over 12,000 persons contracted Hepatitis C in Canada, as a result of blood transfusions received during the late 1980s. More recent reports suggest that as many as 60,000 Canadians were infected with Hepatitis C prior to 1986 and 20,000 more between 1986 and 1990--the period during which it is alleged that the state of scientific knowledge provided methods for testing and screening of the infective agents.¹³ Legal arguments center on the role and accountability of the Canadian Red Cross (CRC) in the collection, monitoring, and distribution of blood products. Specifically, the organization has been accused of failure to adopt measures for screening and treating infected blood, as well as failure to inform blood recipients of their possible and actual exposure to contaminated blood.¹⁴

This study focuses on nursing practice, not on the current controversies surrounding the blood crisis. But this practice must be understood within the larger context of blood issues, since nurses are the front-line workers who interact with the technology, the procedures, the patients and families, and the public. AIDS and hepatitis C irrevocably changed how nurses managed the technology--how they responded to patients' needs for information, care, and support. It changed how they dealt with infection control, self-protection, and screening issues. It removed a sense of complacency that nurses had developed regarding blood products. The advent of AIDS and hepatitis C effectively prevents this study from becoming a 'history of progress.'

Conceptualizing Technology and Nursing Practice

Typically, nurses have not perceived themselves to have or to use technology.¹⁵ The result has been to render much of what nurses do invisible, and therefore undervalued. Researchers in the history of technology suggest that "broadening the definition of technological actor has made the concept a more flexible one, as not only inventors and designers but also . . . users can now be understood as agents in processes of technological change."¹⁶ Furthermore, they suggest that the human body is an appropriate setting for study, "as a site of technological activity . . . [in a] blurring of boundaries between human and machine"¹⁷

In 1976, the United States Congress Office of Technology Assessment developed a definition of medical technology which included both hardware (equipment and facilities) and software (knowledge and skills) components. This commonly-accepted statement defined medical technology as "the set of techniques, drugs, equipment, and procedures used by health-care professionals in delivering medical care to individuals and the systems within which such care is delivered."¹⁸ Although knowledge is implied in the definition, it is not clearly articulated nor visible as part of the technology. As a result, knowledge is often overlooked in research and evaluation strategies while the technology is at risk of becoming merely a task and the person using the technology, a de-skilled technician.

Sociologists have contributed insights from institutional and organizational contexts which shaped technology and influenced its diffusion into medical practice. They have developed models to explain how medical innovations became standard practices.¹⁹ Even though social influences were incorporated increasingly into these models, the explanations view medical technology as primarily physician-centered, and are inadequate for understanding the technological roles of nurses. While nurses have influenced, shaped and resisted technology (as will be demonstrated in the study), they have not usually been in positions of control or decision making.

Science in the twentieth-century came to be increasingly understood within the empirical model of objective, experimentally-produced evidence.²⁰ Technology emerged mid-century as an

application of basic science research. Historian Ruth Schwartz Cowan issued a caveat, that when writing about science and technology, it is necessary to use temporal and/or descriptive adjectives—distinguishing between the use of the terms, based on the contemporary understanding of what comprised science. She noted that "knowledge comes in many forms, which can be acquired in many different ways, and gets applied all the time."²¹ Cowan also pointed out parallels between the conceptualizations of science/technology and gender: "Some say science is theoretical and technology is practical; . . . that men are rational and women are practical. Some historians have argued that, in chronological sequence, science comes first and then technology follows when science is applied so as to meet some human need . . . technology [is], in a salient way, science's poor sister."²² For the most part, women have been portrayed as users of science and not knowledge developers of science.

Understanding transfusion as a nursing technology developed within the larger dialogue concerning the 'art' and 'science' of nursing, terms which held particular meaning and must be understood within context of their various time periods.²³ Nursing 'science' referred to knowledge of principles as well as to the basic sciences usually associated with the classroom. Among early nursing educators in general, a distinction was made between basic science knowledge which came in the form of lectures on bacteriology, materia medica, chemistry, and anatomy (usually delivered by physicians and called 'nursing science') and the knowledge which came in the form of demonstrations and practice of nursing techniques (usually modeled by nursing instructors and called 'nursing art'). Nursing 'art' referred to the skilled application of both medical and nursing therapeutics, some of which had a scientific base.

These distinctions were not based directly on the presence or absence of scientific evidence although clearly, some early nursing leaders understood and engaged in research. In 1919, Isabel M. Stewart called for a standard of practice which was not based "on the *opinion* of even the most expert, or on a majority vote, but on *the results of actual scientific investigations* [italics in original], . . ."²⁴ According to historian Susan Reverby, by the late 1930s, graduate students at Teacher's

College (Columbia University) were publishing articles on medical/surgical asepsis, thermometer techniques, and the control of bacteriological contamination as part of their course on "comparative nursing practice."²⁵ Early nursing practice was also considered 'scientific' when it was based on efficiency or 'time and motion' studies, reflecting the 'scientific management' movements of the late nineteenth- and early twentieth-century. Interestingly, the student evaluation report at the OCH was titled "Efficiency Record."²⁶

Technology usually fell outside the definition of either art or science.²⁷ It was not a commonly used term in medicine until the 1960s when diagnostic and therapeutic tools became more widely available and more visible in patient care areas. By 1955, the Canadian Nurses' Association published a recruitment brochure, in which "nursing technique" was clearly distinguished from the "natural and social science" content of student curricula.²⁸

For this study, nursing science will refer to those aspects of knowledge developed by formal teaching methods, using conceptual or abstract teaching/learning strategies, emphasizing scientific principles and where available the contemporary research. Nursing art will refer to those aspects of knowledge developed by informal teaching/learning methods, using concrete learning strategies in real-life settings, which may be neither planned nor formally recognized as knowledge.²⁹

In the emerging historiography of nursing, Barbara Melosh and Susan Reverby have published classic research which examined the profession and its origins, using feminist and labor frameworks for an analysis of nurses' roles within the American context.³⁰ Reverby commented that Melosh, ". . . provides a sophisticated analysis of the work culture of twentieth-century nursing and the tensions between the nursing leadership's quest for professional power and the rank and file's efforts to maintain control."³¹ She described her own research as structured in chronological form and confronting the dilemmas of American nursing between 1850 and the end of World War II; these dilemmas centered around "the order to care, in a society that refuses to value caring."³²

Reverby examined changes in nursing practice related to medical therapeutics during the 1920s and 30s. These changes required increasingly trained and educated personnel to use and

interpret the technologies. She contended that these changes resulted in greater demands on nursing service, as physicians became too busy to perform them and added them to nurses' work.³³ In a later article, she examined the relationship of nurses to science, describing how science held different meanings for nurses in different time frames and how the profession sought legitimate status by the pursuit of these scientific paradigms. Science and scientific nursing practice were associated increasingly with the use of a biomedical model and technological advances.³⁴

Kathryn McPherson explored the everyday lives of 'ordinary' nurses at work in a Canadian social context using a social history framework of labor, women's history and medical history. Part of her analysis queried what nurses did at the bedside and what was their growing repertoire of therapeutics. She reiterated Reverby's earlier assertion that following World War II, the proliferation of technological interventions prompted physicians to relinquish certain responsibilities which were then assumed by nurses.³⁵ She has also argued that nurses' technique (the precise protocols, detailed approaches, rituals and routines that constituted their practice) comprised 'nursing science' prior to the 1940s. She noted that "science, in terms of both scientific medicine and scientific management and the rationalization of nurses' work, was a critical determinant in locating nurses in a subordinate position within the health-care hierarchy." Yet, the same rituals and protocols also provided nurses with a discrete set of skills which were used to their advantage in differentiating the trained from the untrained nurse. "Science allowed nurses to distinguish their work from maternal care giving For nurses at the workplace, claims to specific rituals, all in the name of science, were more useful than abstract professional concepts in elevating trained personnel above the informally or untrained competition in the marketplace." According to McPherson, an important distinction was that physicians, administrators and educators retained conceptual authority over the techniques while staff and students were responsible for their execution.³⁶ Based on the arguments of Cowan, Reverby, and McPherson, gender and class rendered much of nursing 'unscientific.'

As medical practice became more specialized during the 1950s and 1960s, so did the technologies and the hospital settings in which they were used. Julie Fairman's dissertation

documented the origins and structuring of intensive care units to meet these new demands.³⁷ Her work suggests however, that these units were more than a "technologic repository" and that "watchful vigilance" of patients was a complex phenomenon that has not been examined nor understood.³⁸ In recent work, Fairman noted ambivalence between the cost and intrusiveness of technology into caring, and increasing demands for its use. She observed that while technology was frequently blamed for interfering in patient care, on the other hand, it was compelling and exciting to nurses. In addition, "nursing is central to the use of technology in hospitals, in fact, it may be argued that the nurse makes technology systems possible."³⁹

Margarete Sandelowski explored issues and problems that nurses encountered with technology (primarily considered as the use of tools) prior to World War II. She divided technology into pre- and post-World War II periods, suggesting that the nature and applications of technology changed extensively due to the influences of war. In many cases, nurses were "the primary and probably (by virtue of greater use) more proficient users of technology"⁴⁰ Though physicians had to order a therapy, nurses were the ones who administered it. Recent research by Sandelowski explored the question of whether technology is at odds with nursing. She criticized nursing literature since 1960, using Mitcham's concepts of technological optimism (in which technology is viewed as time and labor saving, scientific, and extending nursing practice) and romanticism (in which technology is viewed as disruptive, dangerous, and depersonalizing). Her analysis suggested both views are inadequate--that there is a need to differentiate modes of human-machine engagement and need for a continuum of "reconcilability" instead of a dichotomy between nursing and technology.⁴¹

The establishment of nursing as a science was a major impetus to achieving the rights and privileges of professional status as well as educational, economic and power implications for nurses themselves. Nurses needed to distance themselves from their domestic roots in order to claim scientific credibility.⁴² In doing so, a dualism developed between knowledge and practice which became pervasive and divisive within the profession; it impeded the achievement of autonomy and

the development of a distinct body of knowledge capable of incorporating both the theory and technological aspects of caring. As nursing leadership moved further away from the practice setting, it lost a sense of connectedness to practice. At the professional level, nursing leaders focused on establishing organizations, standardizing educational requirements, establishing journals and lobbying for registration/licensing laws. Hamilton asserted that for early leaders (such as Annie Goodrich, Lavinia Dock, and Lillian Wald), it was "clear that the mechanics of nursing and the profession of nursing were distinctly different."⁴³ As late as the mid-1960s at the academic level, "many nursing theorists were supporting the view that learned professions and technical work were incompatible."⁴⁴ Likewise, most of the research conducted during this time had nothing to do with the practice of nursing.⁴⁵ On the other hand, the profession lacked a critical mass of experienced practitioners with the capability to identify clinical research issues and conduct research.

Advancement in the profession consisted of movement away from the patient. To become a supervisor, administrator or educator, the nurse had to leave the ranks of 'doers' and enter the ranks of 'knowers.' Entry was controlled through additional formal education, a codeword (or surrogate term) for class differentiation.⁴⁶ Meanwhile at the bedside, rapid changes associated with medical therapeutics co-opted the focus of a predominantly student labour force. Students struggled to deliver safe and 'efficient' care in the midst of new equipment, procedures and knowledge expectations which were mostly treated as a "little shopping list of skills"⁴⁷ to be demonstrated prior to graduation. A distinct way of 'knowing' which might have developed by valuing the technique of nursing did not evolve because one way of knowing (the theoretical) was rewarded while another way of knowing (the technical) was ignored. Science was advanced at the expense of the art, although superficially nursing was portrayed as both an art and a science and in reality, the nursing curriculum was overwhelmingly comprised of 'practice' hours.

Practice nurses highly valued and sought 'hands' on skills' which brought status primarily within the practice setting among their peers. McPherson suggested skills were central to nurses' collective sense of self.⁴⁸ Melosh found that these technological competencies were also highly

valued by patients and families.⁴⁹ Over time, examples of this discontinuity between the science and the art of nursing were noted in: the absence of technological components within nursing theories; the trend for career advancement to move nurses further away from direct patient care; and low participation rates by practice nurses in educational and research endeavors. This dichotomous and divisive view was facilitated by the manner in which knowledge related to medical technology was constructed for nurses, by the requirement for patient care in the midst of complicating technological activities, and by nurses' work patterns which relied on novice practitioners as the major care givers.

Although practice was becoming increasingly technological and bedside nurses placed a high value on acquiring and maintaining 'skills,' nursing theorists and educators generally neglected to incorporate technological concepts into the knowledge base underpinning the profession. Instead, they sought to dissociate curing activities from caring activities in order to create a distinct identity for the discipline. Technology has generally been treated as 'other,' although nurses have always been utilizers of tools and equipment; they have also been adaptors and innovators although they are seldom recognized or credited for their contributions.⁵⁰ When technology has been discussed in literature and research, authors have adopted definitions similar to those used in the medical technology literature.⁵¹ Only recently have nursing scholars begun to consider the relationship and these efforts remain very preliminary.

Nursing theorists who included some aspect of technology in their nursing models, neither defined nor described how they were using the term. Dorothea Orem described a technological component of nursing practice in her model, referred to as the "designing of care."⁵² Patricia Benner and Judith Wrubel built on Heidegger's concepts of "ready-to-hand, unready-to-hand, and present-at-hand" to explain relationships between nurses and technologies.⁵³ Jean Watson suggested that human care is threatened by medical technology.⁵⁴ Madeleine Leininger's model of caring viewed technological factors as intrusive and restrictive to the cultural care of clients and their support systems.⁵⁵ Marilyn Ray developed a theoretical model for critical care nursing in which research findings demonstrated that the concept of the nurse as a purely technical agent did not exist in

practice.⁵⁸ Rozzano Locsin proposed a beginning model of machine technologies and caring in nursing, suggesting "technologic competence requires intentionality" ⁵⁷ In her model, technology is described "as a human way to know a patient more fully" in the sense that data generated by monitoring devices, functioned to extend the senses and provide information not otherwise available.

Technology, Blood Transfusion, and Nursing

For this research, I defined technology as a system which is socially constructed, consisting of three levels of understanding: first, the machine or equipment level; second, the activity associated with using the equipment or procedural level; and third, the knowledge which develops around the use of the equipment.⁵⁸ Non-traditional sources and alternative perspectives must be used to document this knowledge and its application in nursing practice.

The first level or most narrow definition views technology as the physical equipment or machines. In relation to blood transfusion, nurses not only used a range of tools and equipment, but they occasionally became part of the technology as when they literally were the suction, the pump, or the product itself--becoming 'part artifact.' One example in which nurses acted as part of the equipment involved early donation methods where blood was collected into glass flasks and bottles which were either open at the top or capped, but were not vacuum-sealed. A sluggish flow often impeded the gravity drainage. Photos and audiotapes from the 1940s featured equipment in which a second glass tube was inserted through the cap of the collection bottle, as an air vent for the system. Nurses used this short glass tube to apply negative suction for the collection bottle, facilitating the blood flow--becoming the suction, as pictured in illustration 1.⁵⁹ The Canadian Red Cross (CRC) produced an audio tape for circulation in Canada as part of a campaign for blood donations during World War II, in which radio reporter Bill Herbert, described his experience during an actual donation of his own blood. Part of the description elaborated on the process, as the nurse provided the suction during the entire procedure.⁶⁰



"A doctor having inserted the needle, . . . a St. John Ambulance nurse takes over and completes the procedure."

Illustration 1: The Nurse as Suction for Transfusions

Photograph from Norman Miles Guiou, *Transfusion: A Canadian Surgeon's Story in War and in Peace*, (Yarmouth, Nova Scotia: Stoneycroft Publishers, 1985): 114. Used with permission.

Sometimes, the nurse also became part of the equipment as a human (manual) pump for infusing blood at a rapid rate when gravity flow was not adequate. Nurses even became the 'product' when they were called upon to be emergency donors.⁶¹

At the second level of definition, technology is considered as the activity or means of achieving a goal. I will also refer to this level as 'procedure' or 'procedural knowledge,' since much of this activity was strictly delineated in the form of written procedures, meticulously outlined in texts and procedure manuals. It included the multitude of skills lists which students were required to complete prior to graduation. For blood, examples of nursing activity ranged from meticulous steps in the cleaning of equipment, to blood procurement and administration. Nurses interfaced with technology daily as they carried out medical therapeutics and applied a variety of skills.

Nurses could also be perceived as part of the technology at this second conceptual level, by their participation in public relation campaigns for the Canadian Red Cross (CRC) and by their

personal endorsement of blood donation. An excellent illustration can be found in the *Canadian Nurse* in 1954. To increase the level of volunteer donations, the director of the CRC, Dr. W. Stuart Stanbury targeted and engaged nurses in the promotion by appealing to their duty as citizens: "This [the production of gamma globulin] will necessitate the collection each year of vast quantities of blood from the Canadian public, a task which will not only strain the resources of our Society but will require the assistance of every public-spirited citizen . . . I can think of no more influential group in Canada that its professional nurses, not only in allaying the fears of timorous prospective blood donors but in disseminating authoritative information" ⁶²

The conceptualization of technology at the third definitional level, includes understanding it as both artifact and associated activity--and adds knowledge or 'what people know' in relation to the technology. This level of definition holds the most potential for making large parts of nursing practice visible and valued. It is within this broadest conceptualization, that nursing can be re-connected into a whole. Nursing art and nursing science become nursing again: from their lived experience in the administration of blood transfusions, nurses incorporated use of the equipment and implemented the procedures; they also built their own knowledge related to observation and monitoring, problem solving, critical thinking, teaching, supportive care, patient advocacy, and decision making.

Theoretical Significance and Practical Importance

In tertiary health care settings, one of the dominant characteristics of nursing is the highly technological environment within which caring occurs.⁶³ From its inception, nursing science has been based on a philosophy of holism and on concepts of caring and curing.⁶⁴ Nurses have assumed the challenge of 'humanizing' the illness experience,⁶⁵ but nursing science lacks an in-depth understanding of how caring has occurred within technological contexts. Nurse lecturer Alan Barnard, criticized recent professional literature for assumptions concerning the relationship between nurses and technology. He suggested there is a "more pervasive influence [of technology] on the politics of practice, the values of individuals, nursing practice and decision making, than many nurses

identify." Furthermore, he challenged four common beliefs that "technology is transforming nursing, advancing nursing practice, dehumanising health care or solving the problems of our planet."⁶⁵

As nurses increasingly adopted the biomedical model, the optimism and promises of post-war technology for health care evolved into a sense of disillusionment by the end of the century--related to associated economic costs, ethical considerations, and quality of life issues. Restructuring and rationalization of health care services threatens to reduce nursing to a series of technical tasks which can then be delegated to lesser educated, lower cost providers.⁶⁷ Once restricted to hospital settings and used to justify the rise of hospitals as central to health care, technology now extends into patients' homes. As policies allocate resources and determine the conditions in which technology will be implemented, nurses need a variety of ways to understand how and why they have interfaced with past and present technologies. The purpose and relevance of the study lies in its application for policy and decision making in health care, especially given the current restructuring environment. Historical research offers an alternative, complementary method by which to understand technological choices and influences on nursing practice.

Relationship of Study to Existing Research and Literature on Health Care

In historical research, literature not only fulfills the usual purpose of identifying gaps in the current state of knowledge, but it also guides the choice of interpretive frameworks for analysis and the parameters of time, place, and persons selected for study. Analysis of the literature shapes the research questions and provides the background context for verification of the evidence. Historian Wendy Mitchinson examined the state of medical historiography in English Canada, confirming that research has been monopolized by a focus on "great men and great diseases" and histories of medical institutions. Her findings supported the need for research which uses a social history framework and explores health care beyond the confines of the medical profession--to include other health care options, workers, and even patients. She also stressed the need to understand the

repercussions of adopting certain technologies over others and to expand previous research which has focused predominantly on the nineteenth century, into the twentieth century.⁶⁸

Lack of historical scholarship has contributed to nursing's uneasy and unarticulated relationship with technology. Historians are only beginning to explore questions related to nurses as "shapers" and/or "inheritors" of technology, and how nurses have taken on technological roles and for what reasons.⁶⁹ In spite of new roles for nurses which arose from these opportunities, historians of women in science and/or technology, have ignored the evolution of nursing as a women's science. According to Marsden and Omery, "When and if these historians . . . mention nursing, it is never as a science of equal stature to male generated sciences. Indeed, it is never seen as a science or as a practice based in science at all There is no recognition of the changes in nursing education in the last 50 years which placed increasing emphasis on the scientific basis for clinical practice."⁷⁰ These authors further suggested that feminist historians have also failed to recognize nurses' contributions as a uniquely feminine science by their assumptions that when nursing increasingly adopted a positivistic paradigm for science, they were engaged in a process of 'identification with the oppressor.'⁷¹

Literature pertinent to the North American context in general and the Canadian context in particular, was analyzed for the influences on medical and nursing practice, medical technology, and the state of knowledge about blood (its applications in health care practice and its political/economic aspects in collection and delivery systems). Although social, political, and economic decisions have shaped a different health care system in Canada, inclusion of the North American literature contributed to a fuller understanding of blood transfusion.⁷² Analysis of this body of literature revealed: limited research on health care workers outside of the medical profession; limited research which considers roles of women in either science and/or technology; limited research which uses gender as an analytical concept for understanding how women were involved in science or technology; limited research which examines nurses as women in science or as shapers of

technology; little research on nursing at the practice level; no research on nurses' roles with blood transfusion; and little research on transfusion situated in the Canadian context.

Transfusion must be understood in relation to the major influences on health care and nursing, as well as the evolution of blood and blood services during the time periods under study. Industrialization, immigration, and urbanization were among the major influences on the size and character of communities and had implications for the early, twentieth-century health care environment through the transfer of care from home to hospital, the rise of the profession of medicine and the legitimacy of science, and changing beliefs about health and illness. In turn, these processes shaped a system in which nurses during the mid-1940s were situated to take on new roles and responsibilities related to medical technologies, such as blood transfusions.

Transfer of care from home to hospital

Using a social history framework, Charles E. Rosenberg explored the evolution of hospitals as the central force in shaping the origins of health care in the United States from 1850 to 1910. One concept of his analysis was the "the allure of innovation, of the promised amelioration of painful and incapacitating symptoms through an increasingly effective hospital-based technology."⁷³ In the mid-1800s, medical capability offered little treatment which could not be delivered in the home and readily understood by the layman. Much household medicine was identical with hospital treatment and thus, admission to a hospital was based more on dependency (charity) than on technical resources. By 1920, care had shifted from the home to the hospital; hospital care was more frequently, privately paid care; and this care was being shaped by a biomedical model focused on diagnosis and curing. According to Rosenberg, the shift fostered and supported new technology which then lent legitimacy and scientific credibility to medical practice. In later work, Rosenberg used the 'frame' metaphor to describe the social construction of medical history, reminding the reader that, "medical thought and practice are rarely free of cultural constraint, even in matters seemingly technical."⁷⁴ He pointed out that historians have "in general, failed to focus on the connection between biological event, its

perception by patient and practitioner and the collective effort to make cognitive and policy sense out of this perception.⁷⁵

Rosemary Stevens traced the further expansion of hospitals into a massive corporate complex through the twentieth century. She structured her analysis around tensions between profit and not-for-profit hospital systems, in addition to contrasting models of hospitals as technological systems versus community services. According to Stevens, hospitals have prospered because of medical technology and expertise and while physicians "claimed hospitals as their own domain; nurses were captured by the hospital and institutionally subsumed."⁷⁶ She further suggested that medicine and nursing adopted different roles in relation to technology, based on their different ideologies.

A fundamental change in belief occurred as hospitals moved from being public charities to being public necessities. Services were supported through local taxes and/or user pay systems. Thus the family divested itself of responsibility for care in favour of paid care. Without universal insurance coverage though, two levels of care emerged—one for the private, wealthy patient and another for the public, charity patient.

In Canada, the two-tiered system was an on-going concern through the middle decades of the century. The Marsh Report (1943) on post-war reconstruction, was stimulated in part by a desire to prevent a reoccurrence of conditions which followed World War I (mass unemployment, strikes, riots, and the Depression).⁷⁷ The report outlined comprehensive "social safety-net" policies which were to provide for unemployment, medicare, old age programs and the support of children through family allowances. Full implementation of these social policies required several decades and had various impacts on decisions made within the health care community. Leading ultimately to universal health insurance coverage, this vision (and the policies which followed) eliminated the direct burden on individuals for the costs associated with technologies such as blood transfusion.⁷⁸ By 1959, all provincial governments with a hospital insurance plan (which was nine of the ten provinces) were contributing funds regularly to the Canadian Red Cross Blood Transfusion Service.⁷⁹

G. Harvey Agnew (a founder and former president of the Canadian Hospital Association) published a semi-autobiographical, celebratory account of Canadian hospital history from 1920-1970. Agnew's account corroborates the importance of the insurance programs and described the efforts of hospital boards to organize for the purpose of monitoring and controlling medical care. His descriptions of staffing shortages, the lack of technology (as he viewed it), and the early introduction of blood along with the associated Canadian Red Cross roles also offered brief glimpses of the post-war clinical practice setting.⁸⁰

The Canadian government established the Hospital Insurance and Diagnostic Services Act in 1958, based on the earlier provincial plan in Saskatchewan. Jacalyn Duffin has examined the development of this insurance system in her research on two physicians who were deeply involved in the surveys, politics, and recommendations behind Saskatchewan Premier T. C. Douglas, and his Cooperative Commonwealth Federation (CCF) party's health insurance program.⁸¹ In 1968, this federal program expanded to include physician services by way of the Medicare Act. Comprehensive and universal coverage was finally achieved by further changes which were incorporated in the Canada Health Act of 1984.⁸² Each of these legislative acts had implications for the utilization and delivery of blood services. Within Canadian health care, the development of an insurance system that was universal, comprehensive, accessible, transportable and publicly administered was significant in shaping how this care would be delivered and by whom.

As the middle class increasingly accepted hospitals as the appropriate setting for medical care, the need grew for a cheap, dependable labour supply. Hospitals solved the need by opening training schools for nurses, by which students exchanged extended hours of labour for their education, room and board. Small numbers of graduate nurses were hired in the hospital as supervisors, head nurses and educators. The majority of graduates were left to find their own private duty employment or to marry. By the 1920s and 1930s, as the hospitals continued to graduate large classes into a non-existent work world, nurses had to face high levels of unemployment. Whether it was actually an oversupply or an inability of the public to pay for adequate nursing care is unclear.⁸³

For students and the few graduate nurses who found employment in the hospital, the developing work culture manifested gendered and classed attributes. Physicians became the 'captain of the ship,' the 'father of the family' (with the nurse as mother, the patient as the child, and the hospital referred to as a house—hence the term 'house doctor.') Nurses were to show deference to authority at the same time that they were responsible for the discipline of the patient—to assure patient compliance with treatment regimes.⁸⁴ Hospital governance shifted from the control of the lady superintendents and lay leaders to physician boards and male trustees in these years.⁸⁵

Graduate nurses generally preferred private duty practice or employment in larger institutions which offered higher pay. Private duty afforded more independence although the nurse was frequently dependent on physician referrals and employment could be seasonal and sporadic as in outbreaks of polio, tuberculosis and influenza. As a result, nurses developed into a mobile workforce, capable of working across provinces and countries.⁸⁶ By the interwar years, the emergence of public health nursing presented nurses with alternative options. Caring moved (to a limited degree) back into the community setting; more autonomy could be achieved although nurses still encountered opposition from physicians and restrictions on their practice.⁸⁷

The Weir report of 1932 was a comprehensive, eighteen-month study of nursing education which also gave a representative view of the nursing practice context and issues because education and practice were so intertwined for nurses of this period. A joint committee of the Canadian Medical Association and the Canadian Nurses Association hired Professor George Weir, Head of the Department of Education at the University of British Columbia, as the Director of the Survey. Weir struggled to address "the urgent nursing problem of the hour:—How shall the gap between the needy patient and the needy nurse be bridged?"⁸⁸ The research questions were: Are people of moderate incomes getting the kind of nursing services they need? And are such services available at a reasonable cost? He further acknowledged that the "interests of the nurse, who obviously is entitled to a respectable livelihood in return for services rendered, must also be considered."⁸⁹

In the process of conducting the survey, Weir produced a thorough description of the state of nursing practice. He conducted 650 conferences and meetings with nurses, physicians, student nurses, educators, administrators, and the public. He visited 145 nurse training schools and collected a wide variety of data from anecdotal letters and survey forms to 2,280 intelligence tests administered to nursing students. The final report revealed a need for extensive changes to nurses' education and made recommendations for practice which were intended to raise the standards of both. For example, in comparing the relative value of the student versus the graduate nurse to the hospital, statistical findings indicated the relative value of the student to be 55.5 per cent of the graduate. The report then advocated for a greater proportion of graduate nurses as more economical to the hospital and more beneficial to the student.⁹⁰ As well, it made recommendations for more equitable financial compensation while raising concerns for reducing the financial burden to the patient. While the study was insightful, the recommendations were slow and only partially implemented. The economic recession of the 1930s brought extreme financial hardships for graduate nurses instead of the reforms envisioned by Weir.⁹¹

By the end of the 1930s, however, hospitals were not able to meet the increased demand for nurses for a variety of reasons. Some of these were purported to be the enlistment of nurses for military service, the competition of higher salaries paid in the United States, the loss of nurses to marriage, and the increased work opportunities/choices for women in general.⁹² These shortages served as impetus for changes such as shorter working hours, incentives for married nurses to return or to stay in practice (whereas previously, nurses had not been permitted to work after marriage), and wage improvements. Changes were occurring in labour expectations and working conditions for nurses. While hospitals were rapidly becoming the major employer of nurses, the expansion which followed the end of the war contributed to massive nursing shortages which continued into the 1970s.

Changing beliefs about science, medicine, health and illness

In the 1880s, physicians and nurses had overlapping roles characterized more by caring than curing. Both gave care in the home, with little technology and limited science; both were unregulated workers. Health and illness were viewed as predispositions, as religious punishments, and/or as caused by unfavorable climates (vapours). Treatment was based on sanitary science and moral cleanliness.⁹³ With the gradual acceptance of germ theory and antisepsis, the belief shifted to illness as specific clinical entities with unique sources and pathologies. Health care viewed once as 'instinctive' and 'natural' shifted to the belief that health care was expert knowledge held by a few.

As society accepted the hospital as the locus of medical care, a belief grew that modern hospitals led to healthy communities. Hospitals expanded in number and size, becoming the focal setting of care. Since this required increased numbers of nurses, hospitals increased their enrollment of students to supply the labour force instead of employing graduate nurses. Within that hospital environment, suffering was less important than curing and by controlling the patient's behaviours, the disease could be controlled. Nurses were expected to ensure that patients complied with the physicians orders and that decorum was maintained.⁹⁴ Through the middle decades, there was little emphasis given to patient decision making or even to explicit consent. Nor did patients generally expect to participate in these activities. The belief in the expertise and judgement of the physician was seldom questioned.

A growing belief in medical expertise was based partially on the scientific claims made in relation to technological skills and tools for diagnostic and cure activities. Dominant themes from the literature on medical technology include: technological innovation and diffusion, technology and the organization of medical work, costs, and social regulation of new technologies. Few historians have explored the social implications or the patients' perspectives related to particular technologies.⁹⁵ Harry M. Marks points out that "clinical utility is as much a product of historical events as an inherent property of a technology . . . ," and that necessary components of utility include "requisite enthusiasm

for the product, sufficient patients on whom to assess and demonstrate the . . . worth, and the opportunity to 'train . . . fellow clinicians in a new way of thinking'⁹⁶

J. T. H. Conner has examined medical technology in the Victorian era, specifically to "ascertain the extent to which technology was a component of the Canadian medical scene" and focussed on "medical apparatus that was either designed or built in Canada."⁹⁷ Audrey Davis analysed the existing types of historical research on medical technology of the Victorian era.⁹⁸ She identified common issues such as the standardization of instruments, the selection of criteria to distinguish health and disease, changing concepts of disease, and the stage of illness at which patients sought medical advice. Davis' discussion included social issues, mostly inter-physician relationships and practice settings. Her specific exemplars included thermometry, stethoscopes, cardiometers and the sphygmograph. She identified research issues, suggesting potential sources for study, and future directions for scholars on this topic. No artifacts related to blood were included in either of these studies since the time frames predated the utilization of transfusion as a common medical therapy.

Sociologist Susan Bell described medical technologies after World War II, in relation to the associated research and its diffusion into medical practice.⁹⁹ Bell stated that, in this time frame new technologies were perceived as desirable and that public policy encouraged the expansion of hospital services. She raised issues such as: medical practitioners' adoption of new technologies before they are evaluated; the continued use of technologies after evaluation indicates they are ineffective or unsafe; and the development and diffusion as influenced by interests, values and paradigms of the producers and users. Her research examined the use of diethylstilbestrol (DES) in gynaecology in the United States beginning in the 1940s until it was banned from use during pregnancy in 1971. Bell contributed to an understanding of this technology from the macro and the micro levels, including the patient perspective. As well, she raised significant questions regarding the assumptions behind technology and the process of diffusion into practice.

Historian Stanley Joel Reiser traced the development of selected technological advances in medical diagnoses, primarily during the early twentieth century in the United States and Great Britain. He identified a variety of factors which influenced medical care and the use of technology (such as philosophy and religion, economic and political systems, social and cultural values), but centered his analysis on "the thoughts and actions of doctors and patients as they have responded to the availability of new diagnostic technology, and on the process by which a technical advance is accepted or rejected."¹⁰⁰ His analysis was limited to selected techniques involved in medical diagnosis, however, his conclusions have relevance to the exploration of blood transfusions, in that "techniques influence the relationship of the patient with the physician; they influence the doctor's image of himself as a decision maker; they influence the association of physicians with each other."¹⁰¹

In partial rebuttal to Reiser's work, Sandra Harding suggested technology needs to be understood as a way of organizing labour. She wrote: "The favored social relations also determine what kinds of technologies will be developed and adopted in a given society And centralized control is necessary if just a few people are to extract the maximum profit from labour which is performed mainly by others."¹⁰²

Joel Howell published a major analysis of the relation between technology and medical care at two points in time (1900 and 1925), based on case records at two hospitals in the United States.¹⁰³ He examined the use of three types of clinical technology: urinalysis, x-rays, and blood counts during this period. He asked how and why medical technology became such a routine part of the U.S. medical practice between 1920 and 1925, in what ways was medical care part of a larger system of people and ideas, and when and how the appeal to science derived its power. Howell suggested that technology has been inadequately conceptualized by scholars. He found that: 1) meanings of technology change over time; 2) forms originally created for managing information such as laboratory results, shape which tests are performed and how frequently; 3) new medical technology can emerge without many (or any) new techniques or machines; 4) clinical application

of a technology is related to who uses it and their position within hospital structures (control of technology brought power); 5) popular literature and art revealed emotions related to technology; 6) technology was used first in exploratory, experimental ways; only after social meanings were attached, did specific applications to practice develop; and 7) technology is a process not an isolated event--it is contingent, not autonomous.

In the Canadian context, sociologist George Torrance described hospitals as health factories, building on eighteenth-century work by Tenon which described hospitals as machines which cure.¹⁰⁴ On technology, Torrance pointed out that little is known about the process of adopting new therapies. According to Torrance, new techniques were acquired and spread from the large teaching hospitals to smaller institutions during the 1920s and 1930s. After World War II, the Canadian hospital industry experienced tremendous expansion under the influences of hospital construction, increased funding, and insurance plans with technology as a major factor in these changes.

By the 1970s and 1980s, attitudes were changing toward medical authority. Across North America student activism, civil rights, the sexual revolution, and the feminist movement were challenged assumptions and values from the previous generation. Skepticism, questioning of authority, and disillusionment characterized this generation, in contrast to the optimism of the 1950s and 1960s.¹⁰⁵ This consumer-oriented generation developed attitudes and strategies which would be instrumental in their response to the issues surrounding blood use when they, their family members and friends became victims of blood-transmitted diseases.¹⁰⁶

Sources of Research Material

The Ottawa Civic Hospital (OCH) was selected as the setting for this study based on its role in the evolution of early blood banks and transfusion in eastern Canada,¹⁰⁷ its role as a large, urban, municipally-owned hospital with its own school of nursing, the extent of influence the graduates of this school exerted on nursing practice over the decades under study, and the existence of archival material preserved under the auspices of nursing education at the hospital. These materials

constituted a rich source of data which has been used only for a narrative history of the school of nursing.¹⁰⁸ Sources from the OCH archives included artifacts, lecture notes, examinations, textbooks, photographs, a school of nursing scrapbook, student yearbooks, procedure and policy manuals, alumnae association newsletters, correspondence between administration and practice personnel, correspondence between the Medical Advisory Committee and nursing, minutes of the Nursing Education Committee, and OCH hospital annual reports.

Additional sources included films of the OCH school of nursing graduations (beginning in 1928) which are held at the National Archives of Canada. Records of the Lady Stanley Institute Nurses' Alumnae Association, The Lady Stanley Institute for Trained Nurses, and the County of Carleton General Protestant Hospital are also held at the City of Ottawa Archives and the Bytown Museum. Both institutions and their schools of nursing merged to become the OCH School of Nursing in 1924. Their respective histories, policies and practices influenced the practice environment within which new technologies would emerge.

Since the Canadian Red Cross was responsible for donor recruitment and blood collection, storage, and distribution across Canada, primary sources at the national organization were also used for contextual corroboration. These sources included provincial and national annual reports, committee minutes, policy and procedure manuals for the blood donor clinics, newsletters, public relations materials such as posters and photographs, correspondence between the organization and government agencies, contemporary news articles related to Red Cross activities, editorial responses in professional journals, and official histories of the national and provincial organizations.

Contemporary professional literature from the *Canadian Nurse Journal* and *The American Journal of Nursing* provided additional primary sources. This literature was hand-searched from 1935 to 1966 and searched through electronic databases (CINAHL, Medline) after 1966, for evidence of nurses' developing knowledge and roles in blood technology, as well as evidence of their concerns and opposition to its diffusion. In addition, secondary literature from the fields of medical technology, medical history, blood transfusion, and medical sociology was searched for historical accounts

related to blood as well as recent Canadian historiography on blood agencies and laboratories. Both primary and secondary literature was analyzed for provenance and corroboration of the data, as well as for themes and chronology.

Participants for the oral history interviews were nurses who had been students, practitioners, and/or educators at the Ottawa Civic Hospital during the time under study. They were identified from class lists of the hospital's school of nursing; snowball or network sampling was then used to identify other key informants. The alumnae association was also consulted. The eight participants selected for interview, represented a variety of experiences, practice areas, and time periods from the class of 1942 to the class of 1972. These nurses also represented graduating classes at intervals of 6-8 years. Only three of them continued to practice at the time of the interviews. Biographical data is presented in Appendix E.

After receiving ethical approval from the University of Ottawa Human Research Ethics Committee for oral history interviews (Appendix A), the researcher contacted key informants in person and presented the purpose of the study verbally and in written format (Appendix B). Written consent was obtained prior to the interviews (Appendix C). Participant limitations related to age and health were carefully considered during the recruitment and interview phases of the study as per approval of the ethics review committee. Techniques for interviewing and for analysis were guided by feminist and oral history strategies.¹⁰⁹ Interviews were audiotaped, using a semi-structured interview guide (Appendix D) and the tapes were transcribed for analysis.

Participants had the option of reviewing their tape and/or transcription for clarification of ideas or deletion of sensitive material. Participants could choose to remain anonymous in the use, reporting and publication of findings from the study, however, all participants consented to be taped and quoted. Although there is debate in historical research regarding the use of actual names, locations, and events, the provision of this information facilitates validation of the data. In addition, it can be empowering for the subjects to record their lived experiences.¹¹⁰

Personal communication with a nurse technician, two lab technologists and a physician (who directed the transfusion program at the OCH from 1969 until his retirement in 1996), provided further data for the study which was not taped. Written, informed consent to use the material and to quote them in the research was obtained from these participants as well.

Methods

Historical research methodology, using a social history framework was selected as an appropriate means to understand the wider contextual issues surrounding nurses' practice and blood transfusion technology. As articulated by Hamilton, social history uses particular constructs to form the perspective (or "lens") which frames the study, the questions and the analysis. Knowledge development by means of historical research incorporates the processes of analysis, synthesis and interpretation. Historiography is characterized "as a product of investigation, reasoned argument, interpretation and prose It is the quality of a reasoned argument, sometimes called an interpretive dialogue, derived from the historical record that distinguishes historical scholarship from other forms of research." The emphasis is on understanding and meaning reconstructed from data sources. There is an interplay of facts from surviving records with the researcher's existing cognitions, values and intuition. There is also interplay between the person, the context and the thinking.¹¹¹

One of the tools available for conducting historical research is oral history. Oral history has the capacity to incorporate previously overlooked lives, activities, and feelings into our understanding of the past and present.¹¹² It has the capability to add new social understandings to the historical records and to uncover subjective interpretations of the past. This element of subjectivity becomes a strength rather than a limitation. It is especially appropriate for understanding issues within which there are power inequities--such as the views of women, patients, workers, and the general public who are not represented in official, documented records. The proximity of the time frame of this study to the present made it feasible to search for these often neglected perspectives.

The oral history interviews ranged in length from thirty to ninety minutes, with a mode of sixty minutes. After transcription, I used a variety of techniques for analysis. Initially, I read the transcripts for the overall tones and themes of each participant, then for overlapping and emerging themes across the time period. I identified unique themes and stories from each participant as well as commonalities in their experiences. Using computer files, I created individual folders in which the themes were sorted by the guiding research questions, by the concepts for analysis in the proposal, by categories of knowledge (art and science), by time periods within the scope of the study, and finally by collapsing the dominant themes which had emerged, into three main ones. Analysis of the interviews was then incorporated with the other primary-sources, corroborated with the secondary sources, synthesized, and interpreted.

In summary, data consisted of a wide variety of primary and secondary sources, to which techniques for verification were applied to establish the reliability and validity of the data. These techniques established the provenance, concordance, comparison, and corroboration of the data.¹¹³ The historian seeks to determine: how evidence came into existence and for what purpose it was originally intended; who collected it; what biases were operative in the selection of evidence retained; and what biases are operative in the interpretation of the evidence.¹¹⁴

Limitations and Bias

Limitations to this study included: the choice of only one setting which was a large, urban, teaching hospital; the small number of participants interviewed; missing perspectives of racial difference and males in nursing; missing perspectives of nurses who left the profession; and missing perspectives from allied health care workers. I was fortunate to gain limited insight from the patient perspective through witness testimony from a judicial inquiry into medical and nursing care at the OCH in 1949. The use of oral history is both a strength and a limitation to the research. While the participants were selected to represent a variety of time periods and roles, the women are recalling their experiences as interpreted and filtered through ideas and language from the present. On the

other hand, their accounts are a valued and important source for documenting nurses' work at the bedside. I also did not investigate nurses' roles with the Canadian Red Cross to any depth, although it is clear that they ran the blood donor clinics, participated in recruitment of donors, developed policies and procedures around blood collection, and served in both volunteer and paid capacities. Research in these areas would enhance the developing body of knowledge around blood transfusion and nursing roles.

Overview of Chapters: Transfusion by Time Periods

Chapter two provides a background chronology on blood, an overview of the development of transfusions in Canada, and situates the Ottawa Civic Hospital within the larger, transfusion context. Chapters three, four and five present analysis of the data within three time periods based on the nature of nurses' roles and responsibilities related to blood: introduction, delegation, and incorporation. Chapter three examines the origins of the OCH School of Nursing and the period during which transfusion was introduced (1924-1949), from its implementation as a medical therapy to the decision for delegation of the technology to two specific nurses. Chapter four considers the period of delegation to increased numbers of nurses, along with the impact of nurses' work patterns and educational changes on their roles with blood (1950-1970). Chapter five deals with the period of incorporation, when the technology became a routine practice competency for all nurses and perceptions about blood safety changed (1970-1990). In chapter six, I include a synthesis of the research with application for practice, contribution of this work to historical research in general, and directions for future study.

Three major themes emerged: 1) Nursing knowledge was constructed in certain ways to meet the needs of the system, the care provider, and the patient. 2) Technology complicated care giving and relationships. And 3) Nurses' work patterns exerted tremendous influence over the nature of their roles related to technology and the boundaries within which they practised.

Endnotes

1. Associated with the 'école des Annales' movement in France, this 'nouvelle histoire' is founded on a different set of assumptions, which I have adapted for this study. For an explanation of the changes in approach and frameworks for analysis, refer to Peter Burke, "Overture: the New History, its Past and its Future," in *New Perspectives on Historical Writing*, ed. Peter Burke (University Park, Pennsylvania: The Pennsylvania State University Press, 1984).
2. Roy Porter, "The Patient's View: Doing Medical History from Below," *Theory and Society* 14 (1985): 175-198. Charles E. Rosenberg describes this view as an interest in the life of ordinary men and women, in contrast to explanations from the view of the elite (leaders, professionals, the well-educated, the policy makers) or of the innovations themselves. It implies an interest in people's 'ailments' and ways in which they were treated. Refer to "Clio and Caring: An Agenda for American Historians and Nursing," *Nursing Research* 36, no. 1 (1987): 67-68.
3. Joel D. Howell, *Technology in the Hospital: Transforming Patient Care in the Early Twentieth Century*, (Baltimore: The Johns Hopkins University Press, 1995): 229 and 16.
4. Ted Allan and Sydney Gordon, *The Scalpel, the Sword: The Story of Dr. Norman Bethune* (Toronto/Montreal: McClelland and Stewart Limited, 1971); see also: *Blood, Pure and Eloquent: A Story of Discovery, of People, and of Ideas*, edited by Maxwell Wintrobe (Toronto: McGraw-Hill Book Company, 1980).
5. Richard Kapp, "Charles H. Best, the Canadian Red Cross Society, and Canada's First National Blood Donation Program," *Canadian Bulletin of Medical History* 12 (1995): 27-46; George W. Miller, "A Modern Blood Transfusion Service," *Canadian Journal of Public Health* 56 (1965): 329-334.
6. E. H. A. Watson, *History Ontario Red Cross, 1914-1946* (Toronto: Ontario Division Headquarters, n.d.); George W. Miller, "A Modern Blood Transfusion Service," *Canadian Journal of Public Health* 56 (August, 1965): 329-334.
7. Andre Picard, *The Gift of Death: Confronting Canada's Tainted Blood Tragedy* (Toronto: Harper Collins Publishers Ltd., 1995).
8. Results of a meta-analysis of the published professional literature on alternatives to blood transfusions from ten countries, during the time frame of 1966 to 1994, was presented by Ian Graham in a session titled "Bibliometric Analysis," to the International Study of Perioperative Transfusion (ISPOT), Ottawa, May 25, 1996. 8707 articles were identified and the data were analyzed for frequency by the blood technologies studied. The number of documents remained fewer than ten per year from 1966 until 1986 when sharp rises in publication were noted in all ten countries. These increases continued through 1994. For example, in the United States alone, there were five documents in 1986, ten in 1987, twenty-four in 1988, thirty-five in 1989, and fifty-eight in 1990.
9. *The Ottawa Citizen*, "Krever on Trail of Tainted Blood--2," 26 February 1996; "Krever on Trail of Tainted Blood--3," 27 February 1996.
10. Michael Grange, "Blood is 'Filthy,' Inquiry Told," *The Globe and Mail (Toronto)*, 11 December 1996.
11. Picard, *The Gift of Death*

12. Newspapers offered public interest articles several times a week related to the Canadian government investigations of the blood supply (the Krever Commission), the Canadian Red Cross involvement in blood services, advocacy groups such as the Hemophilia Society, and general public responses and experiences as consumers of blood services. See items from *The Ottawa Citizen*, 26 February 1996 - 21 April 1997 such as: "Red Cross to Strengthen Recently Neglected Programs," 26 March 1997; "Firing Signals New Strategy for Red Cross," 24 March 1997; "Justice Krever Accuses Red Cross of Using Appeal to Protect Itself," 4 March 1997; "Why Were the Blood Committee Tapes Erased?" 16 January 1997; "Government Slams Blood Inquiry Head," 7 December 1996; "Blood Official Denies Misconduct," 12 December 1996; "Red Cross Tells Krever its Hands Were Tied," 12 December 1996; "Red Cross Goes on the Offensive," 13 February 1997; "Red Cross Cut From Plans--for Now," 8 February 1997; "Red Cross Delivers Ultimatum," 17 January 1997; "Court Reaffirms Krever's Right to Assign Blame in Blood Tragedy," 18 January 1997; "Blood Official Denies Misconduct," 12 December 1996; "Transfusion Expert Uneasy About Red Cross Blood," 26 February 1997; "Safety of Blood Important Enough to Put Questionnaire to Donors," 22 February 1997. See also articles from *The Globe and Mail (Toronto)*, 12 February 1996 - 28 February 1997 such as: Anne McIlroy and Wallace Immen, "Red Cross Using Public Cash to Fight Hepatitis C Lawsuits," 28 February 1997; Michael Grange, "Blood is 'Filthy,' Inquiry Told," 11 December 1996; and Andre Picard, "Krever Allegations revealed," 12 February 1996. From *The Financial Post*, see articles such as: Jennifer Lanthier, "Blood Money" and "All These Nasty Questions," 8 March 1997. "Bloodless Surgery," radio interview with Joan Leshan, "Sunday Morning Program," Canadian Broadcasting Corporation, Toronto, 17 November 1996.

13. Mark Kennedy and Joan Bryden, "Ministers Rethink Hep C Package," *Ottawa Citizen*, 15 May 1998.

14. Picard, *The Gift of Death*, 1-3.

15. Margarete Sandelowski: " 'Making the Best of Things': Technology in American Nursing, 1870-1940," *Nursing History Review* 5 (1997): 3-22, and "Irreconcilable Differences? The Debate Concerning Nursing and Technology," *Image: Journal of Nursing Scholarship* 29, no. 2 (1997): 169-174.

16. Nina E. Lerman, Arwen Palmer Mohun, and Ruth Oldenziel, "The Shoulders We Stand On and the View From Here: Historiography and Directions for Research," *Technology and Culture* 38, no. 1: 20.

17. *Ibid.*, 25.

18. United States Congress, Office of Technology Assessment, *Development of Medical Technology: Opportunities for Assessment* (Washington, DC: U. S. Government Printing Office, 1976): 4. As an example of the pervasive acceptance of this definition, it has been adopted by the International Society of Technology Assessment in Health Care (ISTAHC) for its use in determining the efficacy and outcomes of technology in medical care, over the past 13 years. See H. David Banta and Seymour Perry, "A History of ISTAHC: A Personal Perspective on its First 10 Years," *International Journal of Technology Assessment in Health Care* 13, no. 3 (1997): 430--453.

19. An analysis of the medical diffusion models can be found in Ian D. Graham, *Episiotomy: Challenging Obstetric Intervention*, (Toronto: Blackwell Science Ltd., 1997): 1-9. See also, J. B. McKinlay, "From 'Promising Report' to 'Standard Procedure': Seven Stages in the Career of a Medical Innovation," *Milbank Memorial Fund Quarterly/Health and Society* 59, no. 3 (1981): 374-

411; and Susan E. Bell, "Technology in Medicine: Development, Diffusion, and Health Policy," in *Handbook of Medical Sociology*, 4th ed., eds. Howard E. Freeman and Sol Levine (Englewood Cliffs, New Jersey: Prentice Hall, 1989); Susan E. Bell, "A New Model of Medical Technology Development: A Case Study of DES," *Research in the Sociology of Health Care* 4 (1986): 1-32.

20. The scientific paradigm which was widely accepted at the beginning of the twentieth century was based on concepts of logical positivism. By the 1960s, alternative paradigms challenged traditional ways of "knowing." For an informative analysis of changing perspectives in the scientific community which included medicine, see Ada K. Jacox and Glenn Webster, "Competing Theories of Science," in *Perspectives on Nursing Theory*, 2nd ed., ed. Leslie H. Nicoll (Philadelphia: J. B. Lippincott Company, 1992).

21. Ruth Schwartz Cowan, "Technology is to Science as Female is to Male: Musings on the History and Character of Our Discipline," *Technology and Culture* 37, no. 3 (1996): 581.

22. *Ibid.*, 576-577.

23. Refer to the research of Joy Louise Johnson, "Toward a Clearer Understanding of the Art of Nursing," University of Alberta, PhD thesis, Faculty of Nursing, Fall 1993. Johnson constructed her dialectical analysis on nursing art by use of the search terms: skill, technique, judgement, ability, know-how, practice, and practical knowledge. She acknowledged the difficulty in identification of terms and searched the years from 1860-1992. Her conclusion is that no one has satisfactorily delineated the topic. A limitation to her analysis is the acknowledgment that her study is in "no way historical in aim or method" and thus she assumed the authors to be "engaged in a continuing dialogue even though they belong to different historical periods" (p. 17). My own beginning effort to understand the use of these terms as contextually-constructed leads me to believe this is a significant limitation.

24. Isabel M. Stewart, "Possibilities of Standardization in Nursing Technique," *The Modern Hospital* (June 12, 1919): 451.

25. Susan M. Reverby, "A Legitimate Relationship: Nursing, Hospitals, and Science in the Twentieth Century." In *The American General Hospital: Communities and Social Contexts*, edited by Diana Elizabeth Long and Janet Golden, 135-156. Ithaca: Cornell University Press, 1989): 146.

26. "The Ottawa Civic Hospital School for Nurses Efficiency Record," OCHSNAAA.

27. Joy L. Johnson has attempted to define art as "the name for any skill or technique and includes the useful, the liberal, and the fine arts. Nursing art is a useful art and can be broadly defined as the practical know-how that an individual nurse has in a particular situation, which is used to achieve a particular result," p. 10; she further defines science as "empirical knowledge that is grounded and tested in experience, specifically . . . investigative efforts," p. 9 in "Nursing Science: Basic, Applied, or Practical? Implications for the Art of Nursing," *Advances in Nursing Science* 14, no. 1 (1991): 7-16. In Joan L. Bottorff, "Nursing: A Practical Science of Caring," *Advances in Nursing Science* 14, no. 1 (1991): 26-39, the author compared 'theoretic knowledge' (to know for the sake of knowing) with 'practical knowledge' (to know for the sake of doing), p. 29. She further concluded that "theorists are increasingly ignoring the human body and its associated physical care, making it difficult to differentiate nursing from other caring disciplines," p. 37. The major difficulty with most of the current dialogue lies with the lack of historical construction of these terms.

28. Canadian Nurses' Association, "What You Want to Know about Nursing," (Ottawa: Queen's Printer, 1955).

29. Contextually-constructed terminology for practice knowledge or 'art' included: technic, technique, practice, practical nursing, practical experience, nursing arts, caring, and applied nursing science. Likewise, terms referring to theoretical knowledge or 'science' included: theory, theoretical education, theoretical nursing, basic sciences, scientific management, scientific principles, scientific rationale, nursing science, classroom courses.

30. Barbara Melosh, *"The Physician's Hand": Work, Culture and Conflict in American Nursing* (Philadelphia: Temple University Press, 1982) and Susan M. Reverby, *Ordered to Care: The Dilemma of American Nursing, 1850-1945* (New York: Cambridge University Press, 1987).

31. Susan Reverby, *Ordered to Care*: 1.

32. Ibid.

33. Reverby, *Ordered to Care*: . . .

34. Reverby, "A Legitimate Relationship . . ."

35. Kathryn McPherson, "Science and Technique: Nurses' Work in a Canadian Hospital, 1920-1939," in *Caring and Curing: Historical Perspectives on Women and Healing in Canada*, eds. Dianne Dodd and Deborah Gorham (Ottawa: University of Ottawa Press, 1994); see also McPherson, *Bedside Matters: The Transformation of Canadian Nursing, 1900-1990*. (Toronto: Oxford University Press, 1996).

36. McPherson, *Bedside Matters*: . . . , 78, 88, and 107.

37. Julie Fairman, "New Hospitals, New Nurses, New Spaces: The Development of Intensive Care Units, 1950-1965" (Unpublished Ph.D. dissertation, University of Pennsylvania, 1992).

38. Julie Fairman, "Watchful Vigilance: Nursing Care, Technology, and the Development of Intensive Care Units," *Nursing Research* 41, no. 1 (1992): 56-60. See also classic work done by Judith A. McGaw, "No Passive Victims, No Separate Spheres: A Feminist Perspective on Technology's History," in *In Context: History and the History of Technology*, vol. 1, eds. Stephen H. Cutcliffe and Robert C. Post (Toronto: Lehigh University Press, 1989), pp. 172-191 and Judith A. McGaw, "Women and the History of American Technology," *Signs: Journal of Women in Culture and Society* 7, no. 4 (1982): 798-827.

39. Julie Fairman, "Alternate Visions: The Nurse-Technology Relationship in the Context of the History of Technology," *Nursing History Review* 6 (1998): 137.

40. Margarete Sandelowski, " 'Making the Best of Things' . . . , " 7.

41. Sandelowski, "(r)reconcilable Differences? . . ." 172.

42. For an analysis of the domestic roots of nursing and a beginning understanding of dualistic thinking, two sources are Patricia D'Antonio, "Legacy of Domesticity," *Nursing History Review* 1 (1993): 229-246, and Diane Hamilton, "Constructing the Mind of Nursing," *Nursing History Review* 2 (1994): 3-28. Further scholarly investigation on the art of nursing as seen

through the published literature of thirty-seven nursing theorists formed the basis of a thesis by Joy Louise Johnson, "Toward a Clearer Understanding of the Art of Nursing," PhD thesis, University of Alberta, Faculty of Nursing, Fall 1993.

43. Diane Hamilton, "Constructing the Mind of Nursing, . . .", 7 and also refer to her endnote #33. An excellent analysis of the extent of professionalization movements is forthcoming in The International Nursing History Collective, Barbara L. Brush and Joan E. Lynaugh, eds., *Internationalizing Nursing: A History of the International Council of Nurses, 1899-1999*. In press.

44. Johnson, "Toward a Clearer Understanding . . .," 5.

45. Ibid., 6.

46. D'Antonio, "Legacy of Domesticity," . . . 242.

47. Gwen Hefferman, interview by author, tape recording, Ottawa, 29 January, 1998.

48. McPherson, *Bedside Matters: . . .*, 74.

49. Melosh, "*The Physician's Hand*" . . . : 183-186.

50. Sandelowski, "'Making the Best of Things': . . ." and Julie Fairman, "Alternative Visions: 129-146.

51. Barbara Pillar, Ada K. Jacox, and Barbara K. Redman, "Technology, its Assessment, and Nursing," *Nursing Outlook* 38, no. 1 (1990): 16-19. M. Campbell's statement in *Technology and Nursing: A review and Analysis of Selected Literature* (Ottawa: Canadian Nurses' Association, 1990) represents a growing awareness among practice nurses that "technology is more than devices, products, things, procedures, techniques . . .," but the author was unable to elaborate further on the nursing body of knowledge related to technology.

52. Jacqueline Fawcett, *Analysis and Evaluation of Conceptual Models of Nursing*, 3rd. ed. (Philadelphia: F. A. Davis Company, 1995).

53. Patrician Benner and Judith Wrubel, *The Primacy of Caring: Stress and Coping in Health and Illness* (Don Mills, Ontario: Addison-Wesley Publishing Company, 1989): 80-82.

54. Jacqueline Fawcett, *Analysis and Evaluation of Nursing Theories* (Philadelphia: F. A. Davis Company, 1993).

55. Ibid.

56. Marilyn Anne Ray, "Technological Caring: A New Model in Critical Care," *Dimensions of Critical Care Nursing* 6, no. 3, (1987): 166-173.

57. Rozzano C. Locsin, "Machine Technologies and Caring in Nursing," *Image: Journal of Nursing Scholarship* 27, no. 3 (1995): 202.

58. Wiebe E. Bijker, Thomas P. Hughes, and Trevor J. Pinch, *The Social Construction of Technological Systems: New Directions in the Social History of Technology* (Cambridge, Mass: MIT Press, 1989); and Joel Howell, *Technology in the Hospital . . .*, 11-12.

59. See photograph in Norman Miles Guiou, *Transfusion: A Canadian Surgeon's Story in War and in Peace* (Yarmouth, Nova Scotia: Stoneycroft Publishers, 1985): 114. Photographs which are included in Guiou's book, were taken at the Ottawa Civic Hospital by the National Film Board of Canada. One of these shows the nurse 'being' the suction force to create a vacuum in the blood collection bottle. See also, photo in the Canadian Red Cross news bulletin, *Despatch* 5, no. 7 (November, 1946) and also the description in Frances Brown, "A Blood Donor Service in Halifax," *Canadian Nurse* 38, no. 11 (1942): 872-874.

60. Canadian Broadcasting Corporation, "Our Blood for Their Lives," narrated by Bill Herbert, National Archives of Canada, Documentary Art and Photography Division, source DSINTRNL, ISN 82176.

61. Two student nurses were the blood donors in Helen Marie Caraher, "An Emergency Splenectomy," *Canadian Nurse* 37, no. 3 (1941): 185-186.

62. W. Stuart Stanbury, "Gamma Globulin," *Canadian Nurse* 50, no. 6 (1954): 466.

63. For a general understanding of the technological trends in the second half of the twentieth century, see J. Naisbitt, *Megatrends: Ten New Directions Transforming Our Lives* (London: Macdonald & Company, 1982) and J. Naisbitt and P. Aburdene, *Megatrends 2000: Ten New Directions for the 1990s* (New York: Avon Books, 1990). For further understanding of the use of technology in nursing contexts and the tension between models of curing and models of caring, see Mary Carolyn Cooper, "The Intersection of Technology and Care in the ICU," *Advances in Nursing Science* 15, no. 3 (1993): 23-32; Rozzano C. Locsin, "Machine Technologies and Caring in Nursing," . . . ; 201-203; Barbara B. Minckley, "The Multiphasic Human-to-human Monitor (ICU model)," *Nursing Clinics of North America* 3, no. 1, (1968): 29-39; and Marilyn Anne Ray, "Technological Caring: . . . : 166-173.

64. Patricia Benner and Judith Wrubel, *The Primacy of Caring: Stress and Coping in Health and Illness* (Don Mills, Ontario: Addison-Wesley Publishing Company, 1989); see also references to Cooper, Locsin, Minckley, and Ray.

65. Cynthia Toman, "The emergence of cardiovascular nursing as a specialty at the Ottawa Civic Hospital, 1968-1972." Paper presented at the Canadian Association for the History of Nursing, Halifax, June, 1996.

66. Alan Barnard, "A Critical Review of the Belief that Technology is a Neutral Object and Nurses are its Master," *Journal of Advanced Nursing* 26, (1997): 127.

67. Alison L. Kitson, "Johns Hopkins Address: Does Nursing Have a Future?" *Image: Journal of Nursing Scholarship* 29, no. 2, (1997): 111-115.

68. Wendy Mitchinson, "Medical Historiography in English Canada," *Health and Canadian Society* 1, no. 1 (1993): 205-227.

69. McPherson, "Science and Technique: . . . ; and *Bedside Matters*: . . . ; Sandelowski, "Making the Best of Things": . . . ; and "(Ir)Reconcilable Differences? . . .

70. Celine Marsden, and Anna Omery, "Women, Science, and a Women's Science," *Women's Studies* 21 (1992): 480-481.

71. *Ibid.*, 487.

72. Recommended sources for understanding the influences which helped to shape the Canadian health care system as distinctly different from the American system are: C. David Naylor, *Private Practice, Public Payment: Canadian Medicine and the Politics of Health Insurance, 1911-1966* (Kingston, Ontario: McGill-Queen's University Press, 1986); Malcolm G. Taylor, *Health Insurance and Canadian Public Policy: The Seven Decisions that Created the Canadian Health Insurance System*. (Montreal: McGill-Queen's University Press, 1978); Jacalyn Duffin, "The Guru and the Godfather: Henry Sigerist, Hugh MacLean, and the Politics of Health Care Reform in 1940s Canada," *Canadian Bulletin of Medical History* 9 (1992): 191-218. For a general, sociological overview of the Canadian healthcare system refer to: Juane Nancarrow Clarke, *Health, Illness, and Medicine in Canada*, 2nd ed. (Toronto: Oxford University Press, 1996). Finally, some of the current issues around restructuring in the 1990s are represented in Pat Armstrong and Hugh Armstrong, *Wasting Away: The Undermining of Canadian Health Care* (Toronto: Oxford University Press, 1996).

73. Charles E. Rosenberg, *The Care of Strangers: The Rise of America's Hospital System* (New York: Basic Books, Inc., Publishers, 1987): 7. See also his introductory essay, "Community and Communities: The Evolution of the American Hospital," in *The American General Hospital: Communities and Social Contexts*, eds., Diana Elizabeth Long and Janet Golden (Ithaca: Cornell University Press, 1989).

74. Charles E. Rosenberg, "Introduction to Framing Disease: Illness, Society, and History," in *Framing Disease: Studies in Cultural History*, eds. Charles E. Rosenberg and Janet Golden (New Brunswick, New Jersey: Rutgers University Press, 1992): xiv.

75. *Ibid.*, p. xvi.

76. Rosemary Stevens, *In Sickness and in Wealth: American Hospitals in the Twentieth Century* (New York: Basic Books, 1989): 11-12.

77. Robert Bothwell, Ian Drummond, and John English, *Canada Since 1945: Power, Politics, and Provincialism*, revised edition (Toronto: University of Toronto Press, 1996).

78. For fuller discussion on the emergence of the hospital, see Charles E. Rosenberg, *The Care of Strangers: . . .* as well as his introductory essay, "Community and Communities: The Evolution of the American Hospital," in *The American General Hospital: Communities and Social Contexts*, eds., Diana Elizabeth Long and Janet Golden (Ithaca: Cornell University Press, 1989); See also: Joel D. Howell, *Technology in the Hospital: . . .*; G. Harvey Agnew, *Canadian Hospitals, 1920-1970: A Dramatic Half Century* (Toronto: University of Toronto Press, 1974); David Gagan, "For Patients of Moderate Means: The Transformation of Ontario's Public General Hospitals," *Canadian Historical Review*, 70, no. 2 (1989): 151-179 and *A Necessity Among Us: The Owen Sound General and Marine Hospital, 1891-1985* (Toronto: University of Toronto Press, 1990); and Barbara Bates, *Bargaining for Life: A Social History of Tuberculosis, 1876-1938* (Philadelphia: University of Pennsylvania Press, 1992).

79. McKenzie Porter, *To All Men: The Story of the Canadian Red Cross* (Toronto: McClelland & Stewart Limited, 1960): 142.

80. G. Harvey Agnew, *Canadian Hospitals, 1920-1970: . . .*

81. Duffin, "The Guru and the Godfather . . . "

82. Duffin, "The Guru and the Godfather;" Clarke, *Health, Illness, and Medicine in Canada*; Bothwell, Drummond, and English, *Canada Since 1945*.

83. George M. Weir, *Survey of Nursing Education in Canada* (Toronto, 1932). In this classic and extensive study, Weir frequently raised this as an issue—how to get the education and wage standards increased to a level nurses could live on while providing much needed care for a population unable to afford it. Hospitals typically took advantage of student labour in repetitive tasks to the detriment of educational needs, yet had no obligation to supply employment opportunities.

84. Excellent analysis of these roles and the origins of the terms may be found in work by Susan M. Reverby, *Ordered to Care: . . .* and Barbara Melosh, "The Physician's Hand": . . .

85. Gagan, *A Necessity Among Us . . .*

86. Gagan, *A Necessity Among Us:..*

87. Meryn Stuart demonstrates the emergence of this field in Ontario in "Shifting Professional Boundaries: Gender Conflict in Public Health, 1920-1925," in *Caring and Curing: Historical Perspectives on Women and Healing in Canada*, eds. Dianne Dodd and Deborah Gorham (Ottawa: University of Ottawa Press, 1994). She also illustrates the challenges and conflicts within which nurses sought to achieve health for mothers and children in "Ideology and Experience: Public Health Nursing and the Ontario Rural Child Welfare Project, 1920-1925," *Canadian Bulletin of Medical History* 6 (1989). See also Denise Baillargeon, "Care of Mothers and Infants in Montreal Between the Wars: The Visiting Nurses of Metropolitan Life, Les Gouttes de Lait, and Assistance Maternelle," in Dianne Dodd and Deborah Gorham, eds. *Caring and Curing: Historical Perspectives on Women and Healing in Canada* (Ottawa: University of Ottawa Press, 1994).

88. Weir, *Survey of Nursing Education in Canada . . .*, 498.

89. *Ibid.*, 15.

90. Weir, p. 455.

91. Kathryn McPherson, *Bedside Matters: . . .*, in particular, refer to chapter 4 on "An Occupation in Crisis: The Third Generation of Graduate Nurses, 1920-1942."

92. Traditional explanations are given by G. Harvey Agnew, *Canadian Hospitals, . . .*. The OCH HARs for 1946-1949 also attempt to explain their nursing shortages. A more analytical discussion of women's roles related to the supply and demand in the profession is presented by McPherson, *Bedside Matters: . . .*, chapter 6.

93. Beverly Boutilier, "Helpers or Heroines? The National Council of Women, Nursing, and 'Women's Work' in Late Victorian Canada," in Dianne Dodd and Deborah Gorham, eds. *Caring and Curing: Historical Perspectives on Women and Healing in Canada* (Ottawa: University of Ottawa Press, 1994).

94. These concepts have been summarized from previously cited works by Bates, Gagan, Boutilier, and Stuart.

95. See the overviews and discussion by Harry M. Marks, "Medical Technologies: Social Contexts and Consequences," in the *Companion Encyclopedia of the History of Medicine*, ed. W. F. Bynum and Roy Porter, vol. 1 (New York: Routledge, 1993).

96. *Ibid.*, p. 1594.

97. J. T. H. Conner, "Medical Technology in Victorian Canada," *Canadian Bulletin of Medical History* 3 (1986): 98.

98. Audrey B. Davis, *Medicine and its Technology: An Introduction to the History of Medical Instrumentation* (Westport, Conn.: Greenwood Press, 1981).

99. Susan E. Bell, "Technology in Medicine: . . . and "A New Model of Medical Technology Development:

100. Stanley Joel Reiser, *Medicine and the Reign of Technology* (New York: Cambridge University Press, 1978) : ix, x.

101. *Ibid.*, p. 227.

102. Sandra Harding, "Knowledge, Technology, and Social Relations" *Journal of Medicine and Philosophy* 3, no. 4 (December, 1978): 353, 355.

103. Howell, *Technology in the Hospital*. See also Howell's earlier work, "Machines and Medicine: Technology Transforms the American Hospital," in *The American General Hospital: Communities and Social Contexts*, eds., Diana Elizabeth Long and Janet Golden (Ithaca: Cornell University Press, 1989), 109-134.

104. George M. Torrance, "Hospitals as Health Factories," in *Health and Canadian Society: Sociological Perspectives*, eds. David Coburn, Carl D'Arcy, Peter New and George Torrance (Canada: Fitzhenry and Whiteside Limited, 1981). In an earlier version of the health factory image, the hospital was referred to as a machine by the eighteenth-century French hospital analyst, J. R. Tenon (1724-1816): "un instrument qui facilite la curation." See Dora B. Weiner, *The Citizen-Patient in Revolutionary and Imperial Paris* (Baltimore: Johns Hopkins University Press, 1993): 373.

105. For a humorous, insightful interpretation of young women's lives during the 1960s, see Susan J. Douglas, *Where the Girls Are--Growing up Female With the Mass Media* (Toronto: Random House, 1994).

106. Picard, *Gift of Death*.

107. See the *Eighteenth Annual Report of the Ottawa Civic Hospital*, 1942, p. 12; W. Stuart Stanbury, *A National Blood Transfusion Service: What it Means to You*, (Ottawa: Canadian Red Cross Society, 1949); and Norman Miles Guiou, *Transfusion:*

108. Valerie Knowles, *Leaving with a Red Rose: A History of the Ottawa Civic Hospital School of Nursing*. (Ottawa: Deneau Publishers and Company Ltd., 1981).

109. Explicit techniques are described in Paul Thompson, "The Interview," (chapter 6), pp. 165-185, "Storing and Sifting," (Chapter 7), pp. 186-202, and "Interpretation: The Making of History," (Chapter 8), pp. 203-226 in *The Voice of the Past: Oral History* (Oxford: Oxford

University Press, 1978). For feminist techniques, refer to Ann Oakley, "Interviewing Women: A Contradiction in Terms," in *Doing Feminist Research*, ed. H. Roberts (New York: Routledge, 1991); Susan Geiger, "What's So Feminist About Doing Women's Oral History," in *Expanding the Boundaries of Women's History: Essays on Women in the Third World*, eds. Cheryl Johnson-Odim and Margaret Strobel (Indiana University Press, 1992).

110. Julie Cruikshank, "Oral Tradition and Oral History: Reviewing Some Issues," *The Canadian Historical Review* 75, no. 3 (September, 1994): 403-418.

111. Diane B. Hamilton, "The Idea of History and the History of Ideas," *Image: Journal of Nursing Scholarship* 25, no. 1 (1993): 45-46. For a fuller explanation of social history frameworks, see also: Peter Burke, "Overture: the New History, its Past and its Future" and "History of Events and the Revival of Narrative," in *New Perspectives on Historical Writing*, ed. Peter Burke (University Park, Pennsylvania: The Pennsylvania State University Press, 1984): 1-23 and 233-248.

112. For an understanding of oral history as a methodology, see: Paul Thompson, *The Voice of the Past: Oral History* (Oxford: Oxford University Press, 1978); Elizabeth Lapovsky Kennedy, "Telling Tales: Oral History and the Construction of Pre-Stonewall Lesbian History," *Radical History Review* 62 (1995): 58-79; Kathryn Anderson, Susan Armitage, Dana Jack, and Judith Wittner, "Beginning Where We Are: Feminist Methodology in Oral History," *Oral History Review*, 15 (Spring, 1987) 103-127; Julie Cruikshank, "Oral Tradition and Oral History: Reviewing Some Issues," *The Canadian Historical Review*, 75, no. 3 (September, 1994):403-418.

113. Oscar Handlin, "Using Historical Sources," in *Clio's Craft: A Primer of Historical Methods*, ed. Terry Crowley (Toronto: Copp Clark Pitman Ltd., 1988).

114. One of my insights from using historical research methods has been to understand the importance of acknowledging the researcher's bias. I have understood and interpreted my data from the perspective of a white, middle class, North American, female nurse who has practiced the majority of her career in the tertiary setting. I am comfortable with the technological caring environment and perceive it as useful and inevitable. However, I approach technology with caution, with concerns for the ethical, cultural, and economic issues it brings. I also bring a strong sense that nurses have important contributions to make in choices about technology. My bias is both a strength and a limitation through close identification with the practice setting and the nurses interviewed.

Chapter 2

'READY TO TAKE ON MORE ': BLOOD TRANSFUSION AND THE OTTAWA CIVIC HOSPITAL BEFORE 1945

The Almonte Train Disaster

By all reports, that Sunday evening (December 27, 1942) at the end of the Christmas holiday weekend, was stormy and cold. The local passenger train was behind schedule and overcrowded—especially the last cars, as individuals and families returned from the Ottawa valley to their homes and jobs. A military troop train carrying personnel from Petawawa to Halifax was traveling into the Almonte station, unaware of the delayed departure of the passenger train and hampered by poor visibility. Unable to stop on the icy rails, it crashed into the back of the local train which was still loading and demolished the last three cars. The impact shook houses for blocks. Final reports attributed 36 deaths and more than 150 injured persons to the wreck. ¹

One man told reporters how he was catapulted through the window of his coach when the collision drove the undercarriage of his car through the coach floor, lifting his seat and heaving him through the double glass of the window on to the loading platform. Another victim's clothing was stripped off by the impact. A woman suffered leg and head injuries, while her husband and baby were killed. The injuries and loss of life touched the community deeply. Among the victims were friends, co-workers, family members (including many children and babies), and soldiers.



Illustration 2: The Almonte Train Disaster

Photograph from City of Toronto Archives, as used in Hugh A. Halliday, *Wreck! Canada's Worst Railway Accidents*, (Toronto: Robin Brass Studio, 1997). Used with permission.

Nurses who were victims of the crash, provided immediate assistance to other survivors. One nurse worked at the site for five hours until the hospital train left for Ottawa, then reported for work in Ottawa at 1:30 in the morning and working the rest of her scheduled shift.² Nursing Sister Toner, a passenger in the next car ahead of the wrecked one, assisted immediately. She used a jack knife to cut the sleeves from her shirt and underclothing to make bandages for the injured:

From her underclothing she ripped enough bandages to see her through until a doctor arrived. Provincial police told reporters that it was nothing short of a miracle the way the girl worked on alone with only her own clothes for supplies and speed that almost seemed super-human. She spoke kind words, administered first aid and when a doctor arrived some 20 minutes later, 14 of the car's 40 injured had been taken care of. Clad only in her skirt, sleeveless shirt and greatcoat Nursing Sister Toner worked on.³

The local Red Cross coordinator phoned five nurses in Smith Falls to go to the wreck site where they worked at the scene, then accompanied the hospital train for Ottawa with the victims.⁴ The small Rosamond Memorial Hospital in Almonte could only take four of the injured, while four other victims were treated at the home of a local physician.⁵

Not all of the recorded events involved acts of heroism. Someone "siphoned all the gasoline from the full tank of an R.C.A.F. [Royal Canadian Air Force] ambulance, as it stood in the Union Station yard waiting to take to hospital, persons injured in last night's Almonte train wreck."⁶ For days, the lists of the dead and the injured (including their specific injuries and level of progress) were published in local newspapers. But among the headlines was another story—the role of the Ottawa Civic Hospital (OCH) in caring for the survivors and the role played by the first Blood Bank in this disaster.⁷

Almonte was (and is) a small community located forty-two kilometers west of Ottawa. When the accident occurred around 8:30 PM, the OCH was notified and began preparations to receive mass casualties. A special hospital train was dispatched from Almonte for victim transport.⁸ The hospital called in graduate staff, physicians and surgeons. Patients were discharged and others transferred to make room for the injured. Student nurses were mobilized to prepare extra procedure trays and equipment. Accounts of the event frequently referred to nurses waiting at the emergency doors for the ambulances to arrive and to the efficiency with which eighty-four stretcher cases were admitted in two hours. When one nurse (who was working the night shift at the time), volunteered to stay on duty for the arrival of the casualties, she was told to "get some sleep" because she would be busy that next night, caring for the survivors.⁹

In 1942, the OCH board of trustees had approved the location of a regional blood bank at the hospital. It opened in November, just six weeks prior to the Almonte wreck—the first major activation of the transfusion service. In addition to the personal accounts, newspapers described the role of the OCH in receiving and treating victims and the role attributed to blood donations as a "life saving fluid."¹⁰ News headlines recalled: "Scenes at Station as Injured Reach Capital, The Civic was

Ready, Capable Staff Work Enabled Civic to Care for Injured, Red Cross Blood Saves Many Lives in Wreck Emergency, and Blood Donor Wakened at 5 a.m. Second to Aid Wreck Victims."¹¹

At the OCH, the Blood Bank put out a request by telephone to the Red Cross for twenty-five donors to come to the hospital where they would be available for blood collection as needed through the treatments and surgeries. In addition, the hospital requested and received forty-five containers of dried plasma from the military. Some stories recount how donors walked to the hospital during a bitterly cold night, through the dark because it was too early for the scheduled trolleys to run.

Although the OCH Blood Bank opened only six weeks earlier, the Canadian Red Cross had conducted a massive donor recruitment program ("Blood for the Wounded") since 1940, specifically for military use overseas.¹² This campaign operated out of Toronto under Dr. Charles Best and the blood donated was "to be used in the treatment of shock suffered by His Majesty's forces."¹³ As noted in the Canadian Red Cross Society's *News Bulletin*, a careful distinction was made between this program and the voluntary blood donor services for civilians. A large quantity of blood was needed to meet established quotas per month, per region. As the war escalated, so did the need for blood. Considerable effort was required to increase the voluntary donations. The Ontario Division sought a "continuous and effective flow of Red Cross information through every possible channel . . . the press, the radio, the movie and the pulpit."¹⁴ As donors came into Ottawa from outlying regions of eastern Ontario, "red directing signs, marked 'BLOOD FOR THE WOUNDED' in white [letters,] led from all highways to Red Cross House."¹⁵

Blood took on a very public role during this event. From the time of the disaster, citizens of the Ottawa region would be more aware of blood transfusions as an available medical therapy for civilian needs. One particularly poignant account in the *Ottawa Citizen* described how the blood donor center in Almonte became an improvised morgue for train victims: "Over the door of the room in which the bodies lay was the sign 'Blood for the Wounded,' part of Almonte's blood donor campaign."¹⁶ The media publicity, which raised the visibility of transfusion efficacy and directly

linked its 'life saving' capabilities to the local community level, also served to augment the altruism that would be needed in order to meet increased donor quotas in the Blood for the Wounded project.

Events on the night of December 27, 1942 did not constitute a 'first time' occurrence or a 'great discovery' in the history of blood. Rather, the events illustrated in a very visible and public manner, that blood transfusion technology was now readily available for use in general hospitals. The extension of blood use to civilian populations would require increased numbers of health care workers, available continuously, with knowledge and skills necessary to assume the associated responsibilities. Nurses were well situated for these (and other) technological roles by a convergence of scientific, economic, labour, gender, professional, and educational influences— influences which contributed to the necessary conditions within which, blood transfusion could be incorporated as a nursing competency. This setting both constrained and facilitated technological roles for nurses.

In this chapter, I present a background chronology of blood transfusion, an overview of blood use and issues within the Canadian context, and specifically describe the development of transfusion at the OCH prior to 1945. Once restricted to medical practice, blood would become a shared technology. And around these technological roles, nurses would contribute from their own evolving body of knowledge. As one 1942 graduate nurse commented, nurses were "ready to take on more."¹⁷

Historiography of Blood and Blood Services

The historical literature related to blood falls into three categories: 1) chronological narratives which trace the development and use of blood; 2) celebratory accounts of persons, events, and organizations associated with the use of blood products, its first time uses and contribution to society; and 3) analytical accounts of the use of blood--either from philosophical, economic, or historical perspectives.

Chronological narratives and celebratory accounts of transfusion vary from brief exposés to comprehensive accounts, found in medical journals, textbooks, and in material published by special interest groups (such as the Jehovah's Witnesses).¹⁸ Frequently these accounts appear as introductory remarks to educational material and focus on medical events which were primarily oriented around solving three problems related to transfusion: clotting, the need for practical, aseptic methods of collecting and administering blood, and immunological compatibility.¹⁹

Organizational histories pertinent to this study, describe the Canadian Red Cross (which was the sole blood collection and distribution agency in Canada from the origins of blood banking in the 1940s).²⁰ These accounts reinforce the agency's role in war and domestic relief work, its reliance on voluntary workers, its close association with the Canadian Army, and its initial involvement with blood services during the second World War. As contemporary interpretations of blood agency roles, values, and practices, this body of literature contributes insights to the official and professional perspectives during the time frame under study. The Red Cross Societies in the United States (US) and the United Kingdom (UK) were initially involved in transfusion services at the donor level and related to the war effort, but they were not given sole responsibility for the peace time management of blood programs. By 1938 in the UK, "the Red Cross blood bank never became operational and was supplanted by a government organised transfusion service."²¹ The Medical Research Council agreed to administer the blood depots on behalf of the Ministry of Health until the National Blood Transfusion Service was established in 1945.

Analytical accounts of the use of blood (from philosophical, economic, or historical perspectives) appeared in the literature during the 1970s. A debate began between British social administrator, Richard M. Titmuss and several economists, arising from a perceived shortage of blood in Great Britain.²² The debate questioned if a voluntary blood system could meet the growing medical demand for blood. Titmuss claimed to have investigated "the scientific, social, economic and ethical issues involved in [blood's] procurement, processing, distribution, use and benefit in Britain, the United States, the USSR, South Africa and other countries."²³ Rebuttals were then

published in the form of five essays written by economists, from perspectives of the private market, the political market, and the charity market.²⁴

In his ambitious project, Titmuss planned to examine beliefs, attitudes and values both past and present, drawing on historical, religious and sociological materials. He admitted however, the primary focus became "the role of altruism in modern society."²⁵ His choice of countries appeared to have been an attempt to represent different decisions about the commercialization of blood management. The value of his study for my research lies in the portrayal of contemporary attitudes and thought concerning blood in the 1960s, as well as the pertinent questions raised, but not explored in depth. These questions concerned truthfulness in donors, questions about health and medical history, characteristics of donors, reward systems for donors, standards in donor selection, motivations for giving, and obligations in receiving.

A decade later, Dutch journalist and editor Piet Hagen continued the discussion of "how a sufficient and high-quality blood supply can be organized in a responsible way and at reasonable cost."²⁶ He examined blood as a commodity and the United States' roles as an exporter of plasma products. As a critic, Hagen raised questions concerning patients' perspective as well as ethical questions related to the exploitation of the third world as a source for blood and plasma.

Pauline Mazumdar studied serology and the Aryan racial state.²⁷ Her initial research was an analysis of the literature on blood between 1901 and 1931 (using a bibliography of 2,979 entries created by the curator of the German Society for Blood Group Research as the database). She found that 50 per cent of the papers dealt with transfusion related problems. The remaining 50 percent dealt with blood groups and disease, race studies, and the genetics of blood groups.²⁸ She also found that the scientific and medical communities displayed the greatest interest in the subject and their interest was primarily physiological.

In a 1988 dissertation, Joel Williams considered ethical issues in the compulsory medical treatment of Jehovah's Witnesses. Set within the environment of American constitutional law, he used theological and bio-ethical arguments.²⁹ In her doctoral research in 1994, Margaret J. Hanson

reviewed risk reduction strategies since AIDS, and "suggest[ed] that some [strategies] have been implemented due to political and legal pressures rather than for scientifically based medical reasons."³⁰ She then developed a model for use as a decision making tool, to reduce the risk of transfusions for recipients.

Recent studies by John Hutchinson have re-constructed traditional accounts of the origins of the Red Cross and the role of Henri Dunant. Hutchinson re-examined the founding of the Red Cross Society as principally a work of humanitarianism and internationalism, suggesting instead that there were other proposals also under consideration in Geneva during 1861-1862. As well, he positioned the event within the larger social context of the industrial revolution with multiple, changing, social and economic structures. Hutchinson concluded that: "these events set the stage for the great paradox of later Red Cross history: "the continuing tension, . . . between those who regarded the Geneva Convention as a first step on the road to building a higher civilization and those who saw only the useful services these volunteer organizations could render to the militaristic nationalism of late nineteenth-century Europe."³¹

In a later study, Hutchinson explored the transformation of the American Red Cross into a national corporation during 1904-1905 through an analysis of a legal case in which the government brought suit against a German-American, for criticism against the management of the organization. Support for the Red Cross was thereafter considered part of American patriotic duty. Hutchinson suggests this case was illustrative of the process of nationalizing and militarizing the American Red Cross.³²

In the Canadian context, Richard Kapp explored the relationship between Dr. Charles Best, Connaught Laboratories, and the Canadian Red Cross Society. His topic was Best's blood serum project at the University of Toronto during the 1930s and 40s, and the establishment of the Canadian Red Cross as the national blood collection agency. Kapp suggested that the idea of blood banking was intended initially for military rather than civilian use.³³ In a later paper, he examined the implementation of Canada's first national blood donor program, with a focus on how wartime

social activism represented a shift in national identity. According to Kapp, popular response to blood donor campaigns varied on the basis of gender, class, regional and ethnic affiliations.³⁴

Recent analytical work by historian, William Schneider, addressed the process of transfusion as it changed "from being a medical curiosity and procedure of last resort to a practical and relatively simple treatment that demonstrated its value in saving thousands of lives" in less than twenty years.³⁵ He suggested that war served to perfect and diffuse the techniques which were already evolving; further, that public expectations for transfusion safety served as an even greater stimulus for developments in transfusion, than did war conditions where blood was used as a last resort.

Necessary Conditions for Transfusion

The development and acceptance of blood for transfusion required the ability to resolve three main challenges: immunological compatibility, coagulation problems, and practical methods for performing transfusions. Only when these problems were addressed by the recognition of blood grouping and type crossing, by anticoagulation methods, and by convenient and aseptic devices for conducting the transfusion, did the technology gain increased acceptance as a therapy.³⁶

Until the early 1900s, methods of transfusion involved direct infusions wherein the donor was connected directly to the recipient in a variety of ways. Semi-direct infusions became possible with the availability of devices to obtain and deliver the blood; donor and recipient were still in proximity but no longer directly connected. With anticoagulation and asepsis, indirect infusion became possible; donor and recipient were now separated by space and/or time. The extension of storage life (primarily by the addition of glucose and/or citrates) finally allowed for the banking of blood. The necessary components for obtaining, storing, and re-infusing were available by the end of the 1930s, although the evolution of these techniques would continue as blood became an increasingly used medical therapy.

A chronology of blood transfusion is constrained by contemporary definitions of the term 'transfusion' and by the products that were infused. In early sources, transfusion accounts most

often referred to oral ingestion of blood while in later materials, transfusion also included the practice of phlebotomy or blood-letting. Many of the broad brush chronologies which are in existence have been constructed on secondary sources and need to be understood within a careful analysis of the terms of reference used. For example, records and policies of the 1920s to 1940s included blood under the category of infusions, classifying the process as equivalent to intravenous infusions and blood as just another type of solution.

Chronologies which concern the 'taking in of blood,' frequently refer to the first blood transfusion as occurring in 1492, when Pope Innocent VIII received the blood of three young men for the purpose of rejuvenation.³⁷ This commonly quoted anecdote lacks reliable verification and its provenance is questionable. Closer examination of the event indicates that the blood would have had to be ingested rather than injected, since the knowledge and techniques were not yet known for infusion. Other early anecdotes describe the practice of humans ingesting blood for the purpose of improved, competitive performances or for assimilating desired attributes of the donor—such as courage, bravery, or strength in battle.³⁸ In such cases, blood was believed to confer longevity and/or behavioral changes. Blood was not yet understood in terms of specific properties such as oxygen carrying capacity or volume replacement.

Blood was a difficult product to manage. Therefore, a variety of experimental solutions were infused into humans, such as wine, ale, opium, and milk to avoid some of the difficulties.³⁹ Some of these experiments with fluids continued into the late nineteenth century.⁴⁰ Many early accounts describe a variety of processes and rationales for phlebotomy or blood-letting.⁴¹ This practice was based on the Hippocratic doctrine of the four humors. In this tradition, health was equated to a balance between the humors and phlebotomy was practiced to rid the body of excess or fouled fluids.⁴² Blood was not re-infused. However, some of the techniques for venesection which developed in relation to blood letting practices, formed the basis for the surgical techniques of 'cutting down' on the vein which was later used for both donors and recipients.

Issues of immunology

Using the definition of blood transfusion as the injection of blood into the circulatory system, necessarily places the origin of the procedure after the descriptions of circulation by William Harvey in 1616 and 1628. Most accounts credit the first experiments with transfusion to either of two persons: Richard Lower or Jean-Baptiste Denys (or Denis). Lower conducted demonstrations of blood transfused between animals in England; Denys infused animal blood into humans in France. Both men performed these experiments in 1667, mere months apart. The injected blood involved only a few ounces and had varying results. The human recipients were paid to allow blood to be injected and an audience gathered to view the procedure and subsequent reactions.⁴³

Other reports indicate that blood was used to treat palsy, melancholia, insanity and manias⁴⁴, in attempts to alter personality (as in the use of bovine blood to promote placidity), and in at least one case to promote marital compatibility by transfusion between husband and wife.⁴⁵ Considering the preliminary states of knowledge about transfusing blood between living organisms (ie. lack of knowledge regarding cross-species issues, blood groupings, reactions, antisepsis/asepsis, and coagulation to mention a few), survival in these early experiments was a stochastic event. Even without knowledge of immunology and blood groups, 64.4 percent of transfusions between white humans would pass as compatible by chance, based on the American Association of Blood Banks calculations.⁴⁶

Probably the most significant results of these early experiments were the social and religious restrictions subsequently placed on transfusion experiments. In 1668, the French Parliament and the Supreme Courts of Italy, France and England forbade the practice. In 1675, the Pope of the Catholic Church banned it. Following these prohibitions, there was a gap of approximately 150 years during which experimentation probably went 'underground' or at least restricted itself to animal experimentation. While earlier experiments in using blood for humans attempted to transfer affective characteristics for the correction of mental disorders and personality traits, James Blundell is generally credited with initiation of human-to-human transfusion for acute hemorrhage. By 1818-

1828, Blundell used blood therapeutically for shock in obstetrical cases and reported it in a medical journal.⁴⁷ Blundell re-infused the patient's own blood. He also studied and published principles of blood which represented innovative concepts for the time.⁴⁸

The identification of blood groups and typing techniques around the turn of this century greatly reduced the deaths from incompatible blood. Karl Landsteiner established the ABO system of blood groups based on the immunological importance of blood group antigens and iso-antibodies; later, he also participated in the identification of the Rh factor.⁴⁹ His was not the only grouping system however. J. Jansky and W. I. Moss also developed classification systems similar to Landsteiner's. With the establishment of blood banks and the large scale use of blood during World War II, the medical authorities and the Red Cross Societies advocated a single classification system.⁵⁰

Issues related to coagulation

To overcome the problem of coagulation, initial methods of transfusion focused on developing advanced surgical venesection techniques, elaborate systems of cannulae and the direct connection of donor and recipient. The reduction in time between blood withdrawal and blood infusion was one attempt to prevent coagulation, therefore, speed and surgical skill were essential.⁵¹ Until the early 1900s, methods of transfusion involved direct infusions wherein the donor was connected directly to the recipient in a variety of ways (such as artery-to-artery and artery-to-vein anastomoses or series of cannulae). Since the radial artery was sacrificed in the process, each donor could only give blood twice. Semi-direct infusions became possible with the availability of devices to obtain and deliver the blood (syringes and stopcocks, for example); donor and recipient were still in proximity but no longer directly connected and arteries were no longer sacrificed during the process. Two mechanical solutions involved coating syringes with paraffin prior to withdrawing blood for transfusion⁵² and stirring the flask of blood with a glass rod to de-fibrinate it.

Another solution for the coagulation problem was to use cadaver blood. After death, there is a period of time (between ninety minutes and six hours) when blood becomes liquified. If it was collected and used within the time period, this blood required no anticoagulation treatment. It provided an economical and ready source of blood, popular in Russia but less popular in North America.⁵³ As early as 1892, Landois experimented with the use of hirudin (or leech extract) as an anticoagulant to maintain whole blood in a liquid state. Between 1890 and 1920, a variety of other additives to blood were used: sodium salts of oxalic and citric acids, sodium citrate, and combinations of acid-citrate-dextrose solutions. With effective, convenient and acceptable means of anticoagulation, indirect infusion became possible; donor and recipient could now be separated by space and/or time. Along with solutions to the anticoagulation problem, the extension of storage life (primarily by the addition of glucose and/or citrates) finally allowed for the banking of blood in the mid-1930s.

Issues related to practical delivery systems

Over time, a variety of collection and delivery devices were developed with varying degrees of success. Blood was initially collected in open funnels and flasks, without the benefits of either antisepsis or asepsis. In the early 1900s, both donation and transfusion were surgical procedures, conducted in operating rooms. It was common for persons to be positioned next to each other (usually head-to-foot) for the process. In the semi-direct or syringe method, limiting factors were volume and coagulation of the blood in the syringe. Speed was still a definite asset to facilitate re-infusion. Some procedures describe the need for three physicians to successfully transfuse sufficient volumes.⁵⁴

With the advent of indirect methods for collection and storage, there were still challenges for sterility, transport and storage. As equipment evolved from glass to plastic, from rubber to vinyl, from reusable to disposable, the technology gained increased acceptance as a medical therapy.⁵⁵

The necessary components for obtaining, storing, and re-infusing were available by the end of the 1930s, although the evolution of these components would continue.

Performance of the techniques for transfusion, depended not only on the availability of instruments and experienced persons, but also the degree of private and public interest in the process. In the 1600-1700s, experiments and so-called discoveries took on an aura of public entertainment. Blood transfusions entered the world of the 'salons', for the enlightenment of the wealthy and/or the satisfaction of public curiosity.⁵⁶ For demonstrations, subjects were sometimes paid as incentive to permit the experiment. Some experiments were even reported in local newsletters and journals. Examples included blood slide projection shows, transfusion demonstrations, and microscopy shows. In general, new technologies were viewed as curiosities with entertainment value, prior to their acceptance as science.⁵⁷

The entertainment aspect of transfusion surfaced again in 1924, in the form of a demonstration before a medical audience. Dr. G. Harvey Agnew (one of the founders of the Canadian Hospital Association) recorded his experience during the association's first annual convention. The program committee had arranged the demonstration, selected the participants, and conducted the blood grouping. The gallery and floor of the operating room were filled with observers when Agnew decided to conduct one last check, a direct cross match of the blood to be infused with the recipient's blood. "To my horror, the clumps of reddish, agglutinated cells were distinctly visible The bloods were absolutely incompatible. The young lady. . . would have received the first syringe full all right. But by the time the turnscrew would have been turned and a second syringe of blood partly withdrawn, she would have given a gasp and been beyond help." He suggested that "techniques for matching were not fully mastered and there was conflict of terminology between the then-used Moss and Jansky classifications." According to Agnew's account, his intern saved the day by volunteering his own blood for the demonstration and preventing a tragedy as a 'universal donor.' "The delegates never realized what a tragic situation they could have witnessed."⁵⁸

Canadian Blood Context

Military use

With transfusions increasingly feasible, World War I provided opportunity to test the efficacy of the technology for trauma resuscitation in the field.⁵⁹ Dr. Norman Guiou described his early experiences with transfusion as a medical student of McGill University during World War I, followed by his experiences as a Medical Officer of the Canadian Army, Field Ambulance Unit and his studies in Harlem with Dr. Lester Unger.⁶⁰ Guiou used the syringe (or Unger) method, with other soldiers and medical staff as donors, and a rudimentary method of determining blood groups by mixing samples of the recipient's and potential donor's blood on the "physician's spectacles."⁶¹ Guiou was linked with the OCH when he became a gynecologist on staff with the Ottawa Civic Hospital in 1924; he was appointed as the head of the Committee on Parenteral Fluids and Transfusions and became instrumental in establishing the blood transfusion program in the late 1930s. It is interesting to note that initially blood was categorized with infusions, as merely a different type of fluid; in the late 1940s, blood was more frequently referred to as a transfusion, but still grouped in responsibility to the intravenous team. Guiou was also a member of the World War II Red Cross Committee on "Blood for the Wounded." In 1937, he corresponded with Dr. Norman Bethune about transfusions used during the Spanish Civil War. Bethune replied, describing his "preserved blood service" in which blood was refrigerated at 4°C, stored up to 14 days, and transported to combat areas for use. According to Bethune's letter, the blood was warmed, ideally filtered through gauze, and then injected into the vein by a Higginson enema syringe. He was beginning to experiment with giving blood by the "drip" method and with the use of cadaver blood.⁶²

By World War II, the efficacy of transfusion in treating trauma was well-established. Wartime conditions provided both opportunity and impetus for blood use: large groups of patients, dedicated organizational structure, and financial resources.⁶³ During the war, the Canadian Red Cross (CRC) operated the National Donor Service with responsibility for supplying the military needs for blood. Civilian blood banks had not been included in their initial mandate.⁶⁴ This service opened in January

1940 and closed in August, 1945. The volume of blood collected increased from 5325 units in 1940 to 1,038,701 units in 1944; only 548,124 units had been collected in 1945 when the program was closed because of the end of the war and the CRC's mandate for blood.⁶⁵ The CRC accepted the responsibility at the request of the Department of National Defense. Dr. Charles Best's blood serum project of the 1930s and 40s illustrates one way in which a complex relationship was constructed between the University of Toronto, the Connaught Laboratory, the CRC, and the federal government, in order to mobilize resources, personnel, and the public to provide blood products for the war effort.⁶⁶

From 1939 to 1942, radio and film media were developed jointly by the CRC and the National Film Board to stimulate donation of blood. Early examples of these public relation messages included: "Canadian Blood Saves Lives on All Fronts" (no date), a silent film production with war footage; "Red Cross Blood Serves Canada" (no date); and "Who Sheds His Blood" (1939), a film on Connaught Laboratory and the dried serum project. This last film emphasized the 'trained nurse' involvement throughout the process of donation and used visual imagery of the personnel and product details.⁶⁷

In a 1941 audiotape entitled "Our Blood for Their Lives," a reporter pointed out during the process of donating his own blood, that instead of "...visions of brightly lit operating rooms, men and women in white, and strange, weird and wonderful machines...[donation] takes only a few minutes; no drama or heroics; it could even be performed in your own home."⁶⁸ He frequently described what the nurse was doing (always a concern for patients). The presentation focused on the method of donation, what happens during processing (ie. the Connaught connection), and the administration of a unit of blood to a child injured during the bombing of London. Dominant themes were cleanliness and sterility, convenience and painlessness to the donor, democracy at work (blood as the equalizer among classes and genders), and patriotism. As a physician started a transfusion at the end of the tape, he told the patient, "You'll have Canada to thank for your life today."

Civilian use

In the civilian health care setting, some physicians were transfusing patients by semi-direct or syringe methods in the community as well as in hospitals. Using rudimentary techniques for determining blood type and recruiting the donor from among family, neighbors, friends and/or medical staff and students, the physician transfused as efficiently as coagulation and the number of available syringes would allow. One such anecdote was related by a physician practicing in rural Quebec (near Ottawa). He was summoned to the home of a woman who had been bleeding for a week after a placenta praevia. Dr. Geggie solicited a medical friend in Ottawa to assist him in a transfusion. After sampling, crossing and rejecting seven of the eight potential donors assembled in the home, he sampled the eighth—"a bandit-looking brother-in-law, but his blood suited. We had to run the risk of venereal infection; he denied it of course." Losing track of the number of syringes full that were injected, they worked until they had "at the end of the time, with very little light, no syringes, a fainting donor, but a somewhat aroused recipient That all happened in the 'lean' part of the 20's. Last winter, our patient finished her course; third-stage syphilis, or general paresis of the insane. Perhaps we saved her life in the 20's; did we lose it in the 50's?"⁶⁹

Some local hospitals operated their own private blood banks, referred to as 'walking blood banks.' Initially, these were lists of potential donors who had been typed and could be called in when needed. By the mid-1940s, urban hospitals developed limited short-term storage capacity. Costs were borne by the patient who either paid or replaced the blood on a 'two for one' basis.⁷⁰ Large hospitals in urban centers could potentially meet their requirements for blood but smaller hospitals in outlying areas lacked the resources and population base to be self-sufficient.

Political and organizational influences

Prior to World War II, there was no national level blood service. Canadian provinces strongly defended their right to legislate and control health care as fundamental to the British North America act.⁷¹ The Rowell-Sirois Commission (The Royal Commission on Dominion-Provincial Relationships)

of 1940 negotiated certain taxation powers to provide for social and educational programs (which included health services) from the provinces in return for adjustment grants to the provinces; this approval was granted by the provinces only for the duration of the war, as an emergency measure. At the end of the war, the federal government attempted to renew the agreement and implement a comprehensive plan for old age pensions, unemployment insurance and health policies. At this time, the provincial governments rejected all aspects of the proposal and re-established their individual jurisdiction over matters pertaining to health care.⁷²

Given this political climate, the federal government would have had difficulty forming a national organization to coordinate the supply and demand for blood. But the Canadian Red Cross (CRC) had an established presence with both the military and civilian populations during and after both world wars. In contrast to the federal government, the CRC now had a national presence which could transcend provincial differences.⁷³ The need for an equitable and consistent non-military blood supply was addressed only toward the end of the war effort. The public was aware of uses for blood, physicians increased their use of blood as a medical therapy, the CRC had the infrastructure in place to collect and distribute blood, and the politicians could foresee the advent of health insurance which would pay for it.

A joint committee of the Canadian Hospital Council, members of the Blood and Blood Substitutes Committee of the National Research Council and the CRC Society arranged for a survey of Canadian hospital needs; this survey was conducted by Dr. W. Stuart Stanbury and completed in 1945. The survey covered 327 hospitals and found that the vast majority lacked adequate blood supplies. "Almost everywhere the cost of blood transfusions was so great that it was beyond the patient of average means,...[and] no prepaid insurance plans included the costs of transfusion."⁷⁴ Issues around civilian blood services also raised questions about the ability of the CRC to meet long term demands, to motivate donors when 'patriotic' incentives were no longer operative, and the lack of funding for collection and processing.⁷⁵

The outcome of the 1945 survey was a four-way partnership to establish the National Blood Transfusion Service which began operation in 1947. Stanbury was named the director.⁷⁶ The provincial departments of health would supply the premises for laboratories; participating hospitals would contribute by administering the transfusions free of charge; the CRC would furnish the equipment, medical and technical personnel, the transportation, and operate the service; and the public would contribute the blood on a volunteer basis. Prime Minister Mackenzie King had requested the CRC to establish an office in Ottawa to "promote closer co-operation and mutual assistance" during the war; this invitation was now extended by the Minister of Health and Welfare to the post-war organization.⁷⁷ For Canadians, all blood transfusions would be provided exclusively by the CRC for the next fifty years.⁷⁸

The CRC was faced initially with competition for donors from the local hospital blood banks and also from St. John Ambulance blood services. After a series of negotiations, in January 1951, St. John Ambulance recognized the supply of free blood transfusion services as the prerogative of the CRC ; they agreed in written contract to support the CRC and receded from blood grouping and typing activities, as well as services to local hospitals.⁷⁹

New recruitment messages which advocated peacetime uses of blood were necessary to maintain and increase donations for civilian blood needs. Typical of these were films such as "Miracle Fluid" (1950), "Great Also in Peace: The Role of the Red Cross in Peace" (1950), and "Emergency Blood Transfusion" (1970).⁸⁰ Dealing with the rising incidence of Rh incompatibility through the use of transfusions was a societal issue, exacerbated during this period of rapidly increasing birth rates. According to one report, "Summer 1946, became Baby Season at the Civic In June, 436 mothers and 415 babies occupied the hospital. On one memorable day, 22 babies were delivered, causing the Board of Trustees Chairman E. Norman Smith to comment: 'There was such a flood of babies that we didn't have enough bassinets and we had to use butcher baskets . . . procured from Canada Packers Limited!'"⁸¹ Saving babies was and is, motivational.⁸² "Miracle Fluid" was produced during the time of the baby boom and used the imagery of babies

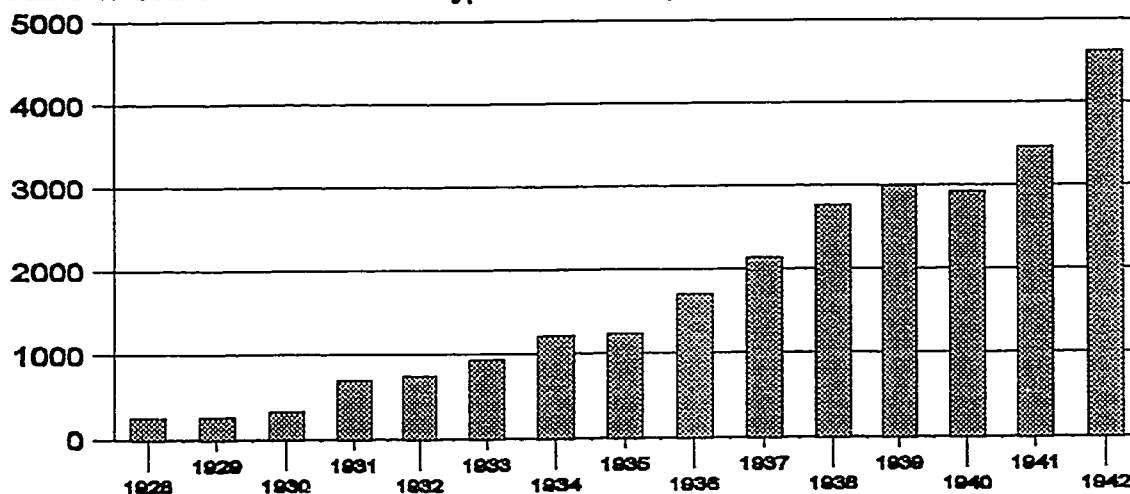
receiving exchange transfusions for the treatment of erythroblastosis fetalis. In an interesting twist of events, the film featured a war amputee as the baby's donor--thus completing the cycle as a grateful, previous recipient of blood.

"Great Also in Peace" built on the ideas of blood as a bond between "all men," deliverable whenever and wherever needed in Canada. Produced in 1950, the film illustrated this concept by imagery in which a map of Canada was displayed with a giant artery superimposed on it. The artery originated in Vancouver (site of the first free regional blood service program) and branched across the entire country by way of a system of capillaries. Nation building and democracy were also motivational issues in the larger social context post-war.

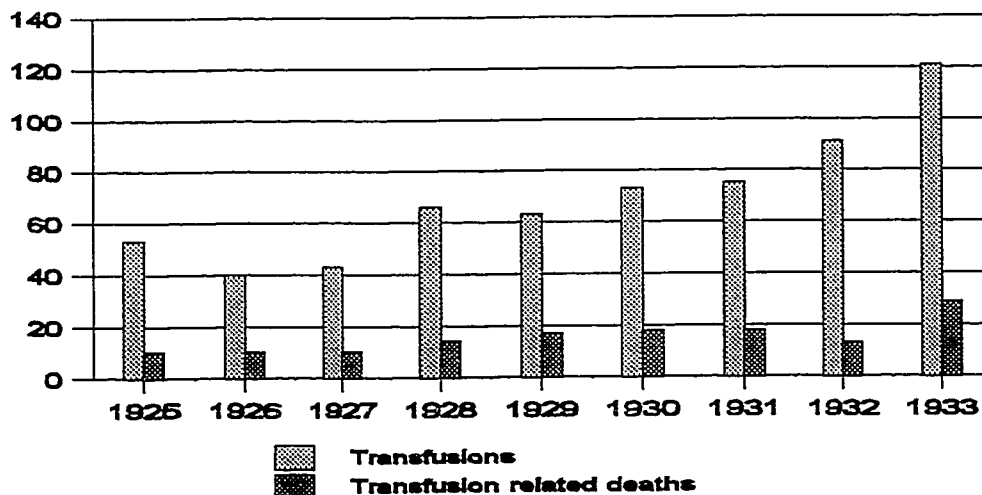
The OCH Transfusion Context

Some of the earliest evidence of blood use at the OCH was found in the hospital annual reports (HARs). The Pathological Department submitted statistics on blood examinations and blood chemistry examinations as two of twelve other types of examinations, vaccines, and post-mortems done by the department from the hospital's opening in 1924. Beginning in 1928, a separate category was listed as 'blood typing examinations;' this category increased from 353 to 1,237 in 1935. Denoted as "blood types for transfusions," there were 1,698 completed in 1936--a significant increase from the year earlier. Without more complete information as to the accounting technique, it is not possible to establish just how many transfusions were actually done from these records.

It is important however, to note that the number of reported typings were increasingly and a certain proportion would have certainly been for the purpose of transfusions. The technologist in charge of the original Blood Bank from 1939-1985, confirmed that typing was performed for the purpose of finding suitable donors. Table 1 was constructed from the hospital annual reports of 1928-1942 to illustrate visually, the change over a fourteen year period during which blood transfusion was becoming a common civilian medical intervention.⁸³

Table 1: Number of Persons Typed for Blood, OCH, 1928-1942

From 1925 to 1933, statistics from internal annual reports to the Board of Trustees compared transfusions given to transfusion-related deaths. Although the purpose of this report is unclear and the meaning of the term "transfusion-related" is not evident, the reports indicate that transfusion was a practice at the hospital and that there were difficulties with the technology. Table 2 displays the data and trends during an eight-year period over which transfusion was used with increasing frequency, yet the rate of death remain approximately the same.

Table 2: Number of Transfusions and Transfusion-related Deaths, OCH, 1925-1933

Anecdotal evidence from the Wakefield community practice of Dr. H. J. G. Geggie and the personal records of Dr. Guiou also corroborate that OCH was assisting physicians in the region with their early use of transfusion therapy. Both doctors recorded their shared experiences with direct transfusions in patients' homes within the Wakefield practice of Dr. Geggie. The syringe and stopcock method was used; grouping was conducted using the physician's spectacles method; and blood samples were taken of all available, potential donors until a match was found from among the family members, neighbors, friends, and sometimes the physician or nurse themselves.⁸⁴

The Hospital Transfusion and Parenteral Fluid Committee (with Guiou as the secretary) utilized a blood donor service known as the Red Star Service which originated as a volunteer veterans' effort to supply blood for patients who could not pay for it. The volunteer service came under the auspices of the CRC as the Ottawa Branch Blood Donor Service in 1938, operating as a pilot project and located away from the hospital site with separate clinical facilities.⁸⁵ In addition to this source of blood, employees of various work groups and social clubs voluntarily donated blood to the hospital blood bank as a type of credit, against which they or their family members could draw if blood was subsequently needed.⁸⁶

Patients who were unable to meet the expectation for replacing blood received, were billed per unit of blood. Initially, costs were \$15.00 per unit in the 1940s, increasing to \$35.00 per unit in the 1950s. One account explained that a burn patient could receive 20 units in treatment, making a burden on the patient.⁸⁷ Professional donors were paid by the hospital. (In 1958, when patients paid \$35.00 per unit for blood, donors were paid \$15.00 per unit.) There was competition between the hospital blood banks and the CRC for these professional donors. Once the hospital located a reliable source, especially of rare blood types, the donors would be repeatedly called back. The CRC complained to the hospital regarding this practice.⁸⁸

Even when the CRC took over the blood supply (in 1958) and provided it free to patients, there were associated costs to the administration which the hospitals were expected to absorb. Agnew suggested this situation created a hardship for hospitals. In his 1974 account, he also wrote::

"Some surgeons have prescribed blood almost routinely and certainly very freely. As a result, on occasion the operating schedule has had to be cancelled [sic]...because the blood supply was exhausted More restraint in the use of the Red Cross blood service has had to be requested."⁸⁹

The administration of blood products at the OCH shifted over time from the Pathological Department, to the Laboratory Department, eventually to the Department of Transfusion Medicine. Accompanying the shift in organization was a shifting paradigm from blood as a component to be viewed under the microscope to blood as a therapeutic agent. Specific reference to transfusions first appeared in 1936, under the report of the Pathological Department in the hospital annual report. In 1942, the year during which the Blood Bank opened and the Almonte disaster occurred, 4619 transfusions were given.

Summary

Complex scientific, sociopolitical, economic, and professional influences shaped health care in general and facilitated new roles and responsibilities for nurses within the system. With the onset of World War II, women were mobilized into the labour force in greater numbers and in a greater variety of roles. The nursing 'glut' of the Depression years, became a 'nursing shortage' which continued long after the war ended, partially due to changes in health care and partially due to changes in women's social contexts. Nurses and nursing in the early 1940s may have been "ready to take on more....," but what did they desire to take on? did they have choices about the content or the process of incorporating new responsibilities? how did they express their concerns and resistance to changes in the expansion of these roles?

In opportunistic fashion, medical technologies passed into the nurses' sphere of responsibility on more than one occasion. The pre-requisites for transfusion existed and had been tested under war time conditions. The leadership given by Guiou, Best, and Stanbury facilitated the establishment of civilian blood banks in the Ottawa area. As the use of blood for war casualties declined, transfusion became a technology in need of an application.

Blood transfusion was initially a medically administered therapy which was gradually incorporated into nursing practice. Originally implemented under the auspices of the Transfusion and Parenteral Fluids Committee, certain aspects of the practice involved the Ottawa Branch Blood Donor Service and the Canadian Red Cross to greater and lesser degrees at different times (for example, pre and post-war activities). Media exposure during the Almonte train disaster provided high visibility for the use of blood, as well as its applicability to civilian needs.

Convergence of these influences resulted in the scientific capability to transfuse blood, an accumulated war experience in blood techniques, changing post-war economics, organizational leadership to facilitate its use, and a ready source of labour. There was a body of nurses 'ready to take on more' and a technology ready to find applications. This technology would require a theoretical knowledge base as well as procedural knowledge. Nurses who understood a milieu in which obedience, precision, routines and accountability were pertinent to clinical work and blood transfusions, enabled the extension of blood as a medical therapy to civilian populations.

Endnotes

1. The disaster accounts are recorded in a variety of sources. Headlines for the *Ottawa Citizen*, 28 December 1942 read: "An Prior Man is Tossed Through Window of Train;" "Death Toll in Almonte Wreck Now 33;" "Injured Passengers Relate Vivid Stories of Tragic Wreck;" "Troop Train Crashed into Standing Local;" *Ottawa Citizen*, 29 December 1942: "Fear Almonte Wreck Death Toll May Go Higher;" the *Ottawa Journal*, 28 December 1942: "36 Dead in Almonte Train Wreck, 118 in Hospitals, 15 are Critical;" "Almonte Folk Heroically Toil Through Night;" the *Ottawa Journal*, 29 December 1942: "Paratrooper and His Fiancee Badly Hurt in Train Crash;" "Valley Town Becomes Morgue;" the *Toronto Star*, 28 December 1942: "Scene of Train Crash One of Horror and Confusion;" "Child's Body Dressed in Snow Suit Found in Debris at Almonte." Institutional perspectives are documented in the Ottawa Civic Hospital Annual Reports (HARs) for 1942 and 1943, as well as the national nursing journal: E. Gertrude Ferguson, "The Almonte Disaster," *Canadian Nurse* 39, no. 2 (February, 1943): 117-118. Additional coverage of personal anecdotes was extensive for the two Ottawa news journals over the initial two days after the disaster.
2. "Ottawa Nurse Aided Victims; Goes to Work," *The Ottawa Journal*, 28 December 1942.
3. "Heroic Nurse Used Clothes to Bind Injured," *The Ottawa Journal*, 29 December 1942; and also Hugh A. Halliday, *Wreck! Canada's Worst Railway Accidents* (Toronto: Robin Brass Studio, 1997).
4. "Smith Falls Nurses Rushed to Wreck;" *The Ottawa Journal*, 28 December 1942.
5. "Four Injured Are in Almonte Hospital," *The Ottawa Journal*, 28 December 1942.
6. "'Meanest Thief' Loots Ambulance." *The Ottawa Journal*, 28 December 1942.
7. Community perspectives may be seen in the newspaper reports: *Ottawa Journal*, 28 December 1942, "The Civic was Ready;" "Red Cross Blood Saves Many Lives in Wreck Emergency;" *Ottawa Journal*, 29 December 1942, "Capable Staff Work Enabled Civic to Care for Injured;" "Blood Donor Wakened at 5 AM Second to Aid Wreck Victims;" *Toronto Star*, 28 December 1942, "Wreck Death Toll Now 33;" *Ottawa Citizen*, 28 December 1942, "Death Toll in Almonte Wreck Now 33;" "Blood Donor Center Housed Wreck Dead;" "No Signs of Confusion As Ottawa Police and Others Cared for Injured People;" "Ottawa Blood Donors Called in Emergency."
8. HAR, 1942, 1943.
9. Jean Milligan, interview by author, tape recording, Ottawa, 29 October, 1997.
10. "Blood Donor Wakened at 5 AM: Second to Aid Wreck Victims," *Ottawa Journal*, 28 December 1942.
11. *Ottawa Journal*, 28 and 29 December 1942.
12. Richard W. Kapp, " 'Front Line Service in Canada': Blood Donation, Social Activism and National Identity on the Home Front, 1939-1945," Unpublished paper presented at the Canadian Society for the History of Medicine, St. Catharines, Ontario, May 31-June 2, 1996.
13. News Bulletin # 2, Canadian Red Cross Society, Ontario Division (July 24, 1940): 3.

14. E. H. A. Watson, *History Ontario Red Cross, 1914-1946* (Toronto: Ontario Division Headquarters, n.d.): 46.
15. Norman Miles Guiou, *Transfusion: A Canadian Surgeon's Story in War and in Peace* (Yarmouth, Nova Scotia: Stoneycroft Publishers, 1985): 109.
16. "Blood Donor Center, Housed Wreck Dead," *Ottawa Citizen*, 28 December 28, 1942.
17. Milligan, interview.
18. Examples of these accounts include: William H. Schneider, "Blood Transfusion in Peace and War, 1900-1918," *Social History of Medicine* 10, no. 1 (April, 1997): 105-126; Maxwell M. Wintrobe, *Blood, Pure and Eloquent: A Story of Discovery, of People, and of Ideas* (Toronto: McGraw-Hill Book Company, 1980); Geoffrey Keynes, ed., *Blood Transfusion*, (London: Simpkin Marshall, 1949); Camille Dreyfus, *Some Milestones in the History of Hematology* (New York: Grune & Stratton, Inc., 1957); John Boyd Coates and Elizabeth M. McFetridge, eds., *Blood Program in World War II*, (Washington, D. C.: Office of the Surgeon General Department of the Army, 1964); C.C. Bowley, K.L.G. Goldsmith and W. Maycock, eds., *Blood Transfusion: A Guide to the Formation and Operation of a Transfusion Service*, (Geneva: World Health Organization, 1971); and George Milles, Hiram T. Langston, and William Dalessandro, *Autologous Transfusions*, (Springfield, Illinois: Charles C. Thomas Publisher, (1971); Richard K. Spence, Jeffrey Carson, Aurel C. Cernaianu and Anthony J. Del Rossi, "Transfusion and Surgery," *Current Problems in Surgery* 30, 12, (December, 1993): 1103-1171.
19. Pauline M. Mazumdar, *Essays on the History of Immunology, 1930-1980* (Toronto: Wall and Thompson, 1989) and *Species and Specificity: An Interpretation of the History of Immunology* (Cambridge: Cambridge University Press, 1994). Also, Peter Hutchin, "History of Blood Transfusion: A Tercentennial Look," *Surgery* 64, no. 3 (September, 1968): 685-700.
20. See P.H. Gordon, *Fifty Years in the Canadian Red Cross* (Canada: n.p., n.d.); Mary Macleod Moore, *The Maple Leaf's Red Cross: The War Story of the Canadian Red Cross Overseas* (London: Skeffington & Son Ltd., 1919); George Sterling Ryerson, *Looking Backward* (Toronto: The Ryerson Press, 1924); Watson, *History: Ontario Red Cross, 1914-1946*; McKenzie Porter, *To All Men: The Story of the Canadian Red Cross* (Toronto: McClelland & Stewart Limited, 1960); and Miller, "A Modern Blood Transfusion Service."
21. H. Dodsworth, "Blood Transfusion Services in the UK," *Journal of the Royal College of Physicians of London* 30, no. 5 (September/October, 1996): 460.
22. The Institute of Economic Affairs, *The Economics of Charity: Essays on the Comparative Economics and Ethics of Giving and Selling, with Applications to Blood* (Surrey, England: The Gresham Press, 1973).
23. Richard M. Titmuss, *The Gift Relationship: From Human Blood to Social Policy* (New York: Pantheon Books, 1971), p. 11.
24. The Institute of Economic Affairs, *The Economics of Charity*.
25. *Ibid.*, p. 12.
26. Piet J. Hagen, *Blood: Gift or Merchandise--Towards an International Blood Policy* (New York: Alan R. Liss, Inc., 1982), p. 8.

27. Pauline M. H. Mazumdar, "Blood and Soil: The Serology of the Aryan Racial State," *Bulletin of the History of Medicine* 64 (1990): 187-219.
28. *Ibid.*, pp. 187-188.
29. Joel Stephen Williams, "Ethical Issues in Compulsory Medical Treatment: A Study of Jehovah's Witnesses and Blood Transfusion," (Ph.D. diss., Baylor University, 1987), abstract in *Dissertation Abstracts International* (1988): A 49/03.
30. Margaret J. Hanson, "Transfusion Safety: A Model for Decision-Making," (Ph.D. diss., The Union Institute, 1994), abstract in *Dissertation Abstracts International* (1995): B55/10.
31. John F. Hutchinson, "Rethinking the Origins of the Red Cross," *Bulletin of the History of Medicine* 63 (1989), p. 578.
32. John F. Hutchinson, "The Nagler Case: A revealing moment in Red Cross History," *Canadian Bulletin of Medical History* 9 (1992): 177-190. For a comprehensive, analytical account: Hutchinson, *Champions of Charity: War and the Rise of the Red Cross* (Boulder, Colorado: Westview Press, 1996).
33. Richard W. Kapp, "Charles H. Best, the Canadian Red Cross Society, and Canada's First National Blood Donation Program." *Canadian Bulletin of Medical History* 12 (1995): 27-46.
34. Richard W. Kapp, "'Frontline Service in Canada': . . .
35. William H. Schneider, "Blood Transfusion in Peace and War, 1900-1918," *Social History of Medicine* 10, no. 1 (April 1997): 105.
36. Peter Hutchin, "History of Blood Transfusion: . . . See also: Pauline M. Mazumdar, *Essays on the History of Immunology*, . . . and *Species and Specificity: An Interpretation of the History of Immunology* (Cambridge: Cambridge University Press, 1994).
37. Typical accounts of the story of Pope Innocent VIII can be found in Louis K. Diamond, "A History of Blood Transfusion," in *Blood, Pure and Eloquent* edited by Maxwell M. Wintrobe (Toronto: McGraw-Hill Book Company, 1980): 659-688 and also in David Brown, "The History of Blood Transfusion," *Nursing Mirror and Midwives Journal* 126, no. 21 (14 June 1968): 19-21.
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40. In Diamond, "A History of Blood Transfusion . . .," reports of milk used for transfusions are cited as: J. Bovell, "On the Transfusion of Milk, as Practised in Cholera, at the Cholera Sheds," *Canadian Journal* 3 (1885):188; J. W. Howe "Intravenous Injection of Human Milk," *New York State Journal of Medicine* 31 (1880):383-384;"Transfusion of Goat's Milk," *New York State Journal of Medicine* 21 (1875): 506-508; T. G. Thomas, "The Intravenous Injection of Milk as a Substitute for the Transfusion of Blood," *New York State Journal of Medicine* 27 (1878): 449-465.
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42. Gerald D. Hart, "Ancient Diseases of the Blood," in *Blood, Pure and Eloquent*, ed. Maxwell M. Wintrobe (Toronto: McGraw-Hill Book Company, 1980): 35.
43. Diamond, "A History of Blood Transfusion," 661, 665.
44. Ibid., 660, 665.
45. Bird, "The History of Blood Transfusion," 42.
46. T. J. Greenwalt, "A Short History of Transfusion Medicine," *Transfusion* 37 (May, 1997): 550-563.
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48. Bird, "History of blood transfusions," and Wintrobe, *Blood, Pure and Eloquent*.
49. Diamond, "A History of Blood Transfusion," 676.
50. Greenwalt, "A Short History"
51. Diamond, "A History of Blood Transfusion" See also the essay by Harry M. Marks, "Medical Technologies: Social Contexts and Consequences," in W. F. Bynum and Roy Porter (Eds.), *Companion Encyclopedia of the History of Medicine*, vol. 1 (1993).
52. More techniques are described by Diamond, "A History of Blood Transfusion"
53. Bird, "The History of Blood Transfusion. . .," 40-44.
54. Guiou, *Transfusion: A Canadian Surgeon's Story*
55. Hutchin, "History of Blood Transfusion: . . .," 685-700.
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57. Dreyfus, *Some Milestones*
58. G. Harvey Agnew, *Canadian Hospitals, 1920-1970: A Dramatic Half Century*. (Toronto: University of Toronto Press, 1974): 89-90. Agnew's account was recorded in 1974, after the terms "universal donor" and "universal recipient" were commonly understood; thus his application of the term, in reference to events of 1924, was anachronistic.
59. Richard W. Kapp, "Charles H. Best, . . . : 29.
60. Guiou, *Transfusion: A Canadian Surgeon's Story*, 86.
61. A description and illustration of the technique is found in Guiou, *Transfusion: A Canadian Surgeon's Story*, 94; descriptions of earlier field experiences from World War I may be found in: Norman M. Guiou, "Blood Transfusion in a Field Ambulance," *British Medical*

Journal, June 22, 1918.

62. Norman Bethune, as cited in Guiou, *Transfusion: A Canadian Surgeon's Story...*, 96.
63. Roger Cooter, "War and Modern Medicine," in W. F. Bynum and Roy Porter (Eds.), *Companion Encyclopedia of the History of Medicine*, vol. 1 (New York: Routledge, 1993): 1545.
64. Kapp, "Charles H. Best," pp. 30-31 and 40-41. Kapp's analysis suggests that the perceived need for large scale blood donations provided an impetus for standardization in blood groupings, in laboratory testing, as well as in the collection and supply aspects. He concludes that "Blood banks for the civilian population had not been Best's intention in 1939, but they were a direct consequence of his actions."
65. "The Canadian Red Cross Society: Summary of Some of the Outstanding Activities and Accomplishments in World War II and Summary of Consolidated Expenditures, Years 1939-1945," a report prepared by the National Statistical Department. National Archives of Canada (hereafter referred to as NA), RG 29, 20-C-46, vol. 4.
66. Kapp, "Charles H. Best..."
67. "Canadian Blood Saves Lives on All Fronts," film (n.d.) NA Documentary Art, ISN 82968; "Red Cross Blood Serves Canada," silent film, (n.d.) NA Documentary Art, ISN 23851; "Who Sheds His Blood," audio visual (1939), NA Documentary Art, ISN 160916.
68. "Our Blood for Their Lives," audiotape (1941), NA Documentary Art, ISN 82176.
69. Guiou, *Transfusion: A Canadian Surgeon's Story...*, 90-95; and H. J. G. Geggie, *The Extra Mile: Medicine in Rural Quebec, 1885-1965*, eds. Norma and Stuart Geggie (n. p., 1987): 107-109.
70. W. Stuart Stanbury conducted a national survey on the state of hospital blood banks which he summarized in *A National Blood Transfusion Service: What it Means to You*, (January 25, 1949), radio address and monograph of the Canadian Red Cross Society. Agnew, *Canadian Hospitals, 1920-1970...*; Guiou, *Transfusion: A Canadian Surgeon's Story...*; Kapp, "Charles H. Best,"
71. A good overview of the history of the Canadian health care system can be found in Alice J. Baumgart, "Evolution of the Canadian Health Care System," in Alice J. Baumgart and Jenniece Larsen (Eds.) *Canadian Nursing Faces the Future 2nd ed.*, pp. 23-43. (Toronto: Mosby Year Book, 1992). The British North American Act is discussed briefly on p. 25, identifying the different sectors' responsibilities.
72. Robert Bothwell, Ian Drummond, and John English, *Canada Since 1945: Power, Politics, and Provincialism*, revised edition (Toronto: University of Toronto Press, 1996): 48, 52, 61, and 74-81.
73. Kapp, "Charles H. Best...;"
74. W. Stuart Stanbury, *A National Blood Transfusion Service: What it Means to You*, (January 25, 1949), radio address and monograph of the Canadian Red Cross Society, CRCA, p. 2. For individual stories of persons who required blood and the impact of that cost in their lives, see the anecdotes collected by senior citizens who collected the stories for the purpose of re-

educating the public about Medicare's reason for being, in response to their perceived erosion of Medicare in the 1990s: *Life Before Medicare: Canadian Experiences*. Edited by Susan Charters. Canada: The Stories Project, Ontario Coalition of Senior Citizens Organizations, 1995. Listen to the voices of Rod in 1938 (pp. 46-47), Frances in 1944-1947 (p. 49), Thelma in 1962 (p. 50), Hilda in 1935 (p. 83), Doreen in 1944 (pp. 84-85), and Leona in 1934 (pp. 85-86).

75. Kapp, "Charles H. Best" See also, "The Canadian Red Cross Blood Transfusion Service: The Implications of a Decision," (1949), no author, Archives of the Canadian Red Cross National Office, Ottawa.

76. Stanbury, *A National Blood Transfusion Service...* See also Canadian Red Cross Society's *Despatch* 5, no. 7, (November, 1946).

77. Letter from W. Stuart Stanbury to the Honourable Paul Martin, Minister of National Health and Welfare, 24 February 1951. NA, RG 29, 20-C-46, vol. 4.

78. Brad Evenson, "Red Cross Winds Down 50 Years as Canada's Blood Collector," *The Ottawa Citizen*, 1 August 1997; and "Red Cross Rejects Recruitment Role," *The Ottawa Citizen*, 2 August 1997.

79. Letter from W. Stuart Stanbury to the Honourable Paul Martin, Minister of National Health and Welfare, 26 January 1951, item 16. NA, RG 29, 20-C-46, vol. 4.

80. "Emergency Blood Transfusion," film (1970), NA Documentary Art, ISN 94686, produced by the National Film Board; "Miracle Fluid," film (1950), NA Documentary Art, ISN 19404, produced by Associated Screen Productions; "Great Also in Peace: The Role of the Red Cross in Peace," film (1950), NA Documentary Art, ISN 18593, produced by Associated Screen Production. Each of these documentary films were produced in collaboration with Dr. W. Stuart Stanbury and the CRC.

81. This account was taken from an unpublished manuscript, titled "Sixty Years of Caring: : The Ottawa Civic Hospital," no author, no date, OCHA.

82. Illustrations of the baby saving themes in the news media include: "Blood To Save Babies' Lives," *The Toronto Star Weekly*, 28 February 1948; Marjorie Earl, "Red Cross Scheme 'Can Save Rh Babies'," *The Toronto Telegram*, 13 May 1949; "Race Death With Rh Baby," *The Toronto Telegram*, 11 May 1949.

83. The HARs, 1928-1942 contained line items for blood typing statistics. The fuller reports made to the board of Trustees of the hospital included additional information on the outcomes of transfusion therapies; some of the reports are held by the OCHA as loose files. Anecdotes are included in Guiou, *Transfusion: A Canadian Surgeon's Story* and in Agnew, *Canadian Hospitals, 1920-1970* Corroborating accounts are recorded by H. J. G. Geggie, in *The Extra Mile: . . .* Geggie's accounts were recorded from journals he maintained, near the end of his medical practice in the Wakefield area of Quebec, in 1960—within the wider Ottawa-Hull region. It was his son (also a local physician) and his daughter-in-law who edited and privately published Geggie's stories. In addition Miss Elizabeth Fenton, the technologist head of the Blood Bank from 1939-1985, corroborated the use of blood typing at the OCH; personal communication, with author, Ottawa, 22 May, 1998.

84. Geggie and Guiou.

85. Watson, *History: Ontario Red Cross*; Kapp, "Charles H. Best,....;" *Canadian Red Cross—Ontario Division News Bulletin* II, no. 6 (July 1945): 3; Guiou, *A Canadian Surgeon's Story*, pp. 98-101. The HAR of the OCH, 1940 contains an entry of thanks to James Potter for blood donated free to patients in the public wards.

86. A scrapbook of newspaper clippings and photos was maintained by Mary Lamb, one of the early graduates of the school of nursing at OCH. Among these clippings are those of the *Ottawa Journal*, 18 April 1957, "Start DVA Blood Bank," in which members of the Ottawa and District Branch of the DVA Employees Association are pictured during donation. Another entry simply dated 1951, pictures Willis Kuhns after a donation for the Employees' Blood Bank at the OCH. A newsclipping from 1958, (no journal identified) contains a description of how the volunteer blood banks work ("Civic Hospital May Supply Blood Free"). These are contained in the Mary Lamb Collection, OCH School of Nursing files at the City of Ottawa Archives (hereafter referred to as COA), Box 30.

87. "Civic Hospital May Supply Blood Free," Mary Lamb Collection, COA. Refer also to the memo from Dr. W. Douglas Piercey (superintendent of the OCH), "Schedule of fees and services: Blood Bank Policy," p. 2, COA, MG 38, box 10.

88. Letter from the CRC to the OCH on December 20, 1947, contained in the files of the Finance and Properties Committee, COA, MG 38-box 10, file 38-1-3-11.

89. Agnew, *Canadian Hospitals, 1920 to 1970....*, 46.

Chapter 3

'ONE OF THE THINGS THAT HAPPENED FOR PATIENTS':

BLOOD TRANSFUSION AND THE ART AND SCIENCE OF NURSING, 1924-1949

Once problems with collection, storage and re-infusion were partially resolved, blood transfusion shifted to applications in general civilian populations. Hospitals constituted a repository of patients, potential applications, and available resources (both material and human) to facilitate further development of the technology. Blood was still viewed as a last resort measure, with little risk involved. The procedure still involved several physicians working together with a donor and recipient, in a manner similar to the transfusions done in home and military settings under emergency conditions. During the war, "The possibility of transmitting disease or potential complications from incompatibility paled in comparison to the immediate needs of saving lives. . . . The fact that the first transfusions were given to the most seriously ill patients as a last resort made it difficult to distinguish the cause of death when transfusions were unsuccessful. . . ."1 In post-war applications, however, "there had been large enough numbers of transfusions to establish a record of haemolytic accidents . . . and higher expectations of success—proved to be as much or a greater stimulus to innovation as the conditions of wartime."²

This chapter examines the period in which transfusion was introduced as a medical intervention for civilians at the Ottawa Civic Hospital (OCH). Nurses participated through roles consistent with their domestic roots and range of therapeutics, in which both equipment and patients required preparation prior to the procedure, physicians required assistance during the procedure, and

cleaning up was required after the procedure. Nursing techniques also reflected an emphasis on efficiency and unquestioning acceptance of what was 'for the good of the patient.'

Analysis revealed that during this initial period, both formal and informal influences shaped nurses roles. The construction of knowledge for and by nurses, was restricted by: the way they were educated in the formal setting; the haphazard way in which practice knowledge developed; and their traditional, domestic roles. Issues of control, gender and power complicated knowledge development. As technology increasingly complicated care giving, a functional system of nursing was implemented—which further restricted nursing knowledge to the performance of procedures. As well, nurses' work patterns through the 1930s and 1940s, limited their ability to develop expertise and build on the roles available to them. The 1932 Weir Report had previously identified many issues which contributed to the discrepancy between the public's need for nursing care and the hospital's ability to meet that need. Not until complaints about medical and nursing care at the Ottawa Civic Hospital reached the media and the law courts at the end of the 1940s, however, did major changes gain impetus.

Development of the Ottawa Civic Hospital and its School of Nursing

The Ottawa Civic Hospital (OCH) originated from an amalgamation of three hospitals in 1924: The County of Carleton General Protestant Hospital, St. Luke's General Hospital (St. Luke's), and the Ottawa Maternity Hospital. The Hospital of Contagious Diseases (also known as the Ottawa Contagion Hospital, the Ottawa Isolation Hospital and the Strathcona Isolation Hospital at various times) became incorporated as well in 1946.³ To provide nursing service for the new hospital, the St. Luke's General Hospital Training School and the Lady Stanley Institute for Trained Nurses (LSI) also merged with the newly established Ottawa Civic Hospital School of Nursing (OCHSN). Three groups of student nurses came together to form the first student body and together with a small core of supervisors and instructors, simultaneously became the new hospital's first care givers.⁴

St. Luke's Training School and the LSI had similar origins with one significant difference—autonomy. St. Luke's General Hospital opened in 1898 and concurrently established its training school with a staff of four graduates and ten pupils, affiliating with the Ottawa Maternity Hospital and the Civic Isolation Hospital. As an independent training school which opened in 1890, the LSI contracted with the County of Carleton General Protestant Hospital, the Ottawa Maternity Hospital and the Hospital of Contagious Diseases for services and training experiences. In return, the County of Carleton General Protestant Hospital paid the institute for nursing services provided. In the first year, the nursing staff was comprised of two graduate nurses and ten pupils. In 1901, the LSI amalgamated with the County of Carleton General Protestant Hospital but retained its original name until the merger with the OCH.

Another manner in which the LSI supported itself was through its registry for private duty nursing and through the use of students for district nursing. From my sources, it is unclear how district nursing and registry nursing was differentiated. In 1894, the superintendent reported that students and graduates were sent into private homes on request for district nursing: "The number of calls for nurses to private cases last year was 112; this year there have been 131, of which I have responded to 101." In addition, "The recent establishment of the Registry for Nurses is another step forward,... and will enable us in the future to respond, if not to every call, at least to a greater number than we have done in past years."⁵

The proportion of students to graduate nurses at the OCH became significant for its impact on nursing practice over time. In 1924, these three hospitals and two schools of nursing merged to form a 550 bed hospital in which student nurses comprised seventy-five to eighty per cent of the nursing staff.⁶ Twenty years later (1944), students made up only sixty-nine per cent of the nursing staff and another twenty years later (1964), they formed approximately fifty per cent of the nursing staff.⁷ The school of nursing also accepted affiliation students from smaller hospital schools in the province, such as Plummer Memorial Hospital in Sault Ste-Marie, the Ontario Hospital in Brockville, The Victoria Hospital in Renfrew as well as hospitals in Picton and Pembroke.

The hospital responded to the demand for increased size and number of services primarily through increasing the number of student nurses. With fewer interns available over this same time period, the traditional practice boundaries between medical and nursing roles became challenged. "During the last eight months of 1944 the Hospital has been operating with a very small intern staff. Eight interns only, instead of the usual 16 to 20 have been available and this has thrown added burdens upon the individual members of the Medical staff...[it has] also meant more work for our supervisors and nurses generally."⁸ Transfusion was introduced into this hospital setting during a period of chronic personnel shortages which persisted over several decades. Sources attributed the shortage to a wartime influx of government and military personnel to Ottawa which increased the population served by twenty-four percent, at the same time as graduate nurses were recruited as nursing sisters in the military.⁹ The hospital system strained to manage care for increasing numbers of patients, using increasing numbers of new technologies, with a declining proportion of experienced nurses.

The Construction of Knowledge for Nurses

Theoretical knowledge (science)

The "Rules for Nurses" of the LSI made it clear to the student that lecture notes "must be written out fully and placed in the Lady Superintendent's office for correction within forty-eight hours after each lecture."¹⁰ Accumulated notes over a three year period of training formed the basic reference material for the graduate nurse in private duty practice. Accuracy and completeness was important for safety, as well as the basis of pride and achievement for the first generation of trained nurses.¹¹

As a student of the LSI's first class, Nancy Wilson recorded notes from lectures given by three physicians. The Superintendent's Report of 1894 confirmed that she had given weekly lectures and instruction in practical work--while the physicians contributed "a very important annual course of lectures." The physicians' lectures were open to the public at a small charge to assist lay women

who wished to care for the sick in their homes, possibly because the LSI could not meet all the requests for 'district nursing'.¹² The same physicians constituted the examining committee at the end of the nurses training period and the 1894 oral exam included a question on blood: "Describe in detail the natural, temporary arrest of hemorrhage; also the various surgical means employed to control bleeding."¹³

Thirteen of fifty-eight pages in Miss Wilson's notes pertained to blood, circulation and hemorrhage. The content focused on functions of blood, the idea that it was 'life sustaining' and 'life ending', its cellular morphology, its coagulation propensity when exposed to air, the process of circulation and fetal development of the circulatory system. Miss Wilson's notes are characteristic of nursing curricula content during the early 1900s, prior to the implementation of transfusion. Examination of the "Prospectus of the Lady Stanley Institute Training School of the County of Carleton General Protestant Hospital" revealed that the school conformed to recommended standards of the time.

Part of the movement toward professionalization concerned educational standards for training nurses. For example, at their first quinquennial meeting in 1904, the International Council of Nurses established minimum criteria for trained nurse courses as: domestic science, elementary anatomy, physiology, bacteriology, materia medica, and technical preparation for ward work as well as three years of practical work in a hospital.¹⁴ By the turn of the century, textbooks written specifically for nurses replaced hand-copied notebooks.¹⁵ The books used in the OCHSN curriculum and retained in the school's library, typically contained content for blood which consisted of abbreviated overviews of circulation and cellular composition, along with medical indications for blood. During the 1920s, procedures began to appear in the texts, pertaining to assistance in the collection of blood specimens and in phlebotomy as a therapeutic treatment.¹⁶ As transfusions became more common, the content of nursing texts increased—in parallel with developing medical techniques such as the Unger method, the Lindeman method, and the citrate method.¹⁷ One 1932 text edition included a section on dangers and difficulties in selecting donors and collecting blood as

well as the steps of the procedure.¹⁸ An obstetrical text even suggested that in emergencies, the nurse could be useful as the donor.¹⁹

Texts of the 1940s included extensive drawings of equipment and diagrams of how to 'set up' for transfusions. The procedures had become long lists of equipment and steps. Rigid, elaborate rules developed around cleaning of the equipment—understandable in the period prior to the availability of penicillin. This body of theoretical knowledge is corroborated by lecture notes of a nursing science instructor, by questions included in the OCHSN examinations, and by questions on the registration exams which nurses were required to pass after 1922.²⁰ The exams were usually organized into categories of knowledge such as: anatomy and physiology, children's nursing, principles of nursing technique, medical nursing, surgical nursing, obstetrical nursing, and preventive medicine and hygiene. Formulated as eight to fifteen essay and short answer questions, the student was usually required to answer between five and ten of them. The content related to blood shifted exam categories across the time periods. Initially in the 1920s and 1930s, there was almost always a question on circulation and/or composition of blood. Not until it became more commonly used in hospitals, did transfusion become an examined topic on the exams, in the late 1930s and 1940s. By the end of the 1940s, blood content reflected the new uses such as exchange transfusions in babies and gamma globulin. By the 1950s, blood and transfusion appeared infrequently on the exams, as one of multiple components within case studies.

Articles on blood began to appear in the *Canadian Nurse* by 1939. Early ones focused on the novelty of indirect transfusion methods, usually describing the procedure in detail to readers. These articles were essentially prescriptive in nature, including signs and symptoms of patient reactions along with the nurse's responsibility.²¹ The dangers associated with blood were identified as the transmission of disease (primarily syphilis) and transfusion reactions (classified at that time as febrile, allergic and hemolytic). The conscientious and efficient nurse was admonished to "watch the recipient...keeping her finger on the pulse and enquiring of the patient as to backache or oppression in the chest."²²

In 1942, articles in the *Canadian Nurse* described newly-formed blood donor services, typically presenting dramatic case studies and promoting the efficacy of blood.²³ The number of articles which described military blood use and the continued need for donations also increased as the war intensified.²⁴ Nurses were expected to participate in education of the public to the need for donors. Many nurses assisted as volunteers in the donor clinics; others were employed by the CRC for the permanent and the mobile blood donor clinics. Typically, the alumnae association newsletters reported on volunteer activities of the OCH graduates with the CRC.²⁵

Curricular content from 1924 through the 1950s, consisted primarily of medical material which had been adapted for students, first by physician lecturers and later by nursing instructors. Inherent in the adaptation was intentional and unintentional bias as to what knowledge was appropriate and useful to the nurse. Educators of nursing students were admonished not to be too academic. In 1930, E. Stanley Ryerson (a physician and faculty member at the University of Toronto), wrote in the *Canadian Nurse* on curriculum for schools of nursing that "by gaining too great a scientific knowledge of diseases, the nurse has a tendency to become too professional in her attitude to the detriment of her services in a nursing capacity An excessive amount of teaching may dampen an interest that should supply the healthy motive throughout the course." Accordingly, theory should be taught minimally with the objective of "helping the nurse to perform her duties. . . more efficiently Most lectures of this type should be inspirational, rather than to impart knowledge."²⁶

Ryerson nonetheless hinted at the possibility of a type of knowledge gained through the practice of their technique: "Nurses gain their most valuable knowledge of diseases by their practical nursing of patients suffering from them."²⁷ Whatever the motivation, he was in a position of authority and writing in the only major professional journal for Canadian nurses. His article was published during a major evaluation of nursing education and practice, when decisions were being made regarding needed changes to this system. As a result, his views could influence the shape of knowledge for new curricula. An apprenticeship type of training which emphasized technique, would

continue to supply a cheap source of labour. Limited, structured knowledge would assure a compliant workforce which could be easily trained and easily replaced while restricting nurses to 'users' of science instead of 'producers' of science. McPherson stated that nurses were legally barred from generating scientific knowledge;²⁸ I suggest that they were effectively barred conceptually, as well.

A 1942 graduate noted that she learned about blood in anatomy/physiology and bacteriology classes taught by nursing instructors and in medical/surgical nursing classes taught by physicians. She recalled Dr. Guiou teaching both formally and informally. As a student and then as a new graduate, this nurse took on responsibilities with transfusions as a routine part of her practice. "I don't think any of us looked on a blood transfusion as something very radical... the patient had to be very sick to receive it, but still we just took it as one of the things that happened for patients."²⁹

Blood was used sparingly, not only because it was a relatively new technology and expensive in a user-pay system, but there was a need to reserve the blood supply for the war effort and it was known to transmit some diseases such as syphilis, malaria, and infectious hepatitis. Although one common transfusion indication was pernicious anemia, alternative treatments to transfusion included nutritional supplements and liver injections. One nurse stated, "I can still see those mauve drinks we made out of liver... the poor patients had to drink [them]; and then there was the use of B₁₂ [injections]."³⁰

Practice knowledge (art)

The practical content of nurses' education far outweighed the theoretical; students spent the majority of their days and weeks in nursing service under the rubric of education. One nurse put it this way: "The emphasis on why you were in the hospital as a student . . . [it] was impressed on you from the day you went in that you were there because of the patient, not that you were going . . . to have surgical experience today or medical experience . . . you were there, supposed to do anything that the patient required."³¹ In the OCH annual reports, there were repeated expressions of concern

for students' learning experiences. Miss Gertrude M. Bennett (Superintendent of Nurses) reported: "Much more satisfactory work could be done and keener interest taken if it were possible to give the pupils their class time in addition to their time 'off duty.'³² Later, "It is still very evident that our pupil nurses are working too long hours and in addition have a great deal of over time; the class time is still taken almost entirely out of the pupil's own time instead of being included in the hours on duty."³³

Nurses and students had a source of practical knowledge in ward procedure books. At the OCH, procedure books existed from the beginning of the hospital. As students transferred from the LSI and St. Luke's and joined with the newly admitted students of the OCHSN in 1924, a newly-developed procedure book assisted the transition and standardized practice.³⁴ This book had potential use as a legal document which would reflect the expected standard of care of that institution (as later happened in 1949 during a judicial inquiry).³⁵ It could also provide a guide when the 'follow up' instructors were not available, establishing the boundaries of safety for treatments administered.³⁶ The initial procedure book was somewhat sparse but over time, revised versions were increasingly complex and elaborated step-by-step 'how to' instructions.³⁷ In addition to promoting efficiency and establishing safety, procedures imposed order and control over practice. Each procedure typically included the purpose of the activity, the equipment required and where to find it, the 'method' (steps in the process) and sometimes, additional cautions or information to note. The earliest OCH procedure book (in use prior to 1948) contained three blood related procedures titled: the blood basket (used to withdraw blood for diagnostic purposes), phlebotomy, and blood transfusion.³⁸

Transfusion was the most complex of the three procedures, in that there were components pertaining to both the recipient and the donor (who were usually together in the same room or in adjacent rooms). The nurse or student had to collect equipment items from the training school office, the operating room, and the Drug room to add to the blood tray prior to the procedure. Basins of warm water were required for holding the beakers of blood and saline. An ounce of whisky or brandy was also among the items listed 'necessary' as a stimulant for the donor.

The procedure involved two nurses and one or two physicians. One nurse set up the equipment and assisted the doctor while the other nurse maintained the blood pressure cuff on the donor between systolic readings of 80-100 mm Hg. Meanwhile the first nurse held the beaker, stirred the blood with a glass rod to keep it from coagulating during the donation, then placed the full beaker in a bowl of warm water, covered with a sterile towel. She then took the blood to the recipient while the doctor scrubbed up again and initiated the intravenous for the recipient with saline solution. The blood was strained through gauze placed over the top of the cylinder; the capped cylinder was inverted and the blood re-infused. When equipment changed to vacuum bottles, one graduate nurse told how she "looked in amazement at these bottles and wondered how you got the solution to run."³⁹

Another nursing sister who had not learned as a student about blood, "learned on the job." She observed that blood plasma was used in "unbelievable amounts" in resuscitation areas all through World War II. Her most memorable transfusion was administered to a German prisoner of war who spoke no English; she described watching his fear turn to relief as the soldier experienced the effects of the transfusion and realized that he was not being harmed.⁴⁰ She also explained that she had not worried about reactions since the product was dried plasma and didn't require grouping—only reconstitution. This characteristic of plasma resulted from the production technique used by the Connaught Laboratory of the University of Toronto. Whole blood was pooled in the proportions of forty-six per cent type O, forty-one per cent type A, ten per cent type B, and three per cent type AB—in order to render the risk of reaction negligible.⁴¹ In this manner, large amounts of plasma could be used in emergency situations such as war, without the resource and time consuming need for typing and for cross matching.

Oral interviews and personal communications suggested that blood was used differently in the civilian and military populations during this early period.⁴² Blood was conserved in Canada, to provide the great quantities which were transported overseas to war victims. Another difference can be noted in the strictness with which blood-related procedures were learned and followed in the hospital setting, while the ability to improvise became essential in emergency, military conditions.

In field hospitals, nurses developed shared knowledge on ways to adapt procedures safely. These nurses had not been taught as students to manage blood products, but they learned from each other's shared experiences 'on the job.' Nursing sisters who trained in Saskatchewan during the Depression of the 1930s, had the reputation among their colleagues as the most capable at 'making do.' In one example, intravenous lines hung from the top of hospital tents and connected to patients, created formidable mazes which entangled nurses on the move.⁴³

Whether nurses built on theoretical knowledge, learned on the job, or improvised under extreme practice conditions, it became evident that transfusion technology could not remain solely within medical practice. The technological practice boundary began to blur as nurses returned to civilian roles and questioned conventional constraints to nursing practice. As one nurse pointed out, "The nurses that went overseas were allowed to do a great deal moreAnd when they came back, they didn't want to back track."⁴⁴

The introduction of blood banks in 1937, provided new options to previously-established direct and indirect transfusion methods.⁴⁵ Careful identification of the recipient now assumed a new importance as the distance between the donor and recipient increased when blood could be stored and transported. Nurses took on the primary responsibility for checking and double-checking patient identification numbers and names against the donor's identification number, cross match number, and blood type. Two nurses were required to complete the verification process together. Once the responsibility for the typing and cross-matching was completed by the hospital laboratory, the rest of the issues around compatibility between donor and recipient depended on nurses' roles in identification and administration.⁴⁶

Technology Complicated Things

Becoming a nurse was a gradual process of socialization to the environment which included not only navigating the interpersonal relationships associated with hospital hierarchy but also learning to incorporate technology into everyday nursing activities. Training schools initiated the student by

assigning housekeeping duties on the wards where she could be watched and in turn, watch activities and dynamics of the unit. "On Sundays, for a half a day, you would be sent in to clean cupboards and this had a dual purpose. You saw what was going on and you also learned what was in the medicine cupboard or in the utility room. But the big thing was, that you became used to the hospital setting and therefore, your reactions weren't the same . . . you could be around, seeing what was happening, even if you weren't doing a lot of the things."⁴⁷ As the student became more proficient, her responsibilities increased to include supervision of the unit and of other students with less experience in the second and third years.

Functional nursing grew out of the efficiency movement and its 'time and motion' studies which were popular in the early 1900s. Efficiency was equated to scientific management and applied in a variety of fields from industry to health care.⁴⁸ By reducing an activity into its individual steps, it was assumed that more efficient ways of performance would be achieved. Applied to nursing, scientific management divided patient care into series of tasks which could be performed by different care givers in assembly line fashion—such as one nurse doing a particular procedure for each patient on the ward who required it. This functional type of nursing care delivery system facilitated care giving by a student population with diverse levels of nursing experience. As well, it provided one way to deal with increasing technology by assigning a given task to a particular nurse, according to the 'efficiency' method. As early as 1938, the hospital's superintendent reported: "It has been impressed upon us that the demands of the doctors for more nursing care is a condition that is likely to increase still further because of the extended treatments that modern therapy calls for [sic]."⁴⁹

There was the "general nurse who was giving your bed baths and giving the general care to the patient; there was a treatment nurse; there was a dressing nurse; there was a medicine nurse [one who administered the medications on the ward]; and there was a desk nurse. You progressed up the line. Medicine nurses and desk nurses were usually third year students."⁵⁰ Repetition was a key component for familiarity with and standardization of the routine. While functional nursing facilitating care giving by novices, it restricted knowledge development by its task orientation. These

roles also reflected nursing's domestic roots through the preparing, assisting, and cleaning functions which nurses assumed.

The patient assignment system gradually replaced functional nursing. Correspondence between the Nursing Administrator, Miss Gertrude Bennett, and hospital committees indicate there was an issue of accountability at stake. In discussing the relative merits of the efficiency method versus the patient assignment method of nursing, one memo noted: "The Patient Assignment Method would save nurses some steps and make it more interesting for them. It would also make it easier for the medical staff to check up on errors of commission and omission."⁵¹

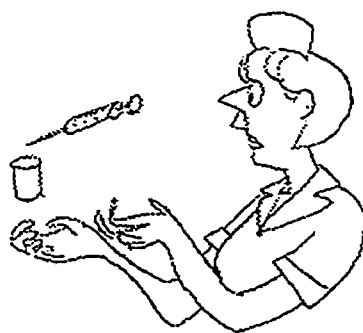
Preparing

Preparation activities required both theoretical and procedural knowledge for the coordination of patient care around the procedure, familiarity with the equipment and the collection process, and the ability to anticipate a range of outcomes and thereby to exert some measure of control over the process. Being prepared also meant being ready when the physician appeared to conduct the transfusion, thus reflecting the efficiency and expertise of the nurse. It was evaluated formally on the student's progress report (or 'efficiency' record) and informally among one's nursing colleagues; it contributed to the nurse's confidence and comfort level with technology.

Preparation inevitably included 'setting up trays.' "In the nursing practice classes you learned how to set up the trays. Because everything had to have a tray . . . On the wards there would be books which would tell you how much blood was needed, whether it needed to be citrated or not . . . you had to set up all your own trays. You didn't have one come up from the central supply room for you."⁵² Trays signified organization, readiness, and asepsis. They comprised individual units which were customized to the procedure and to the physicians' preferences. By presenting the nurse with visual cues, trays could guide the procedure along with memorized, written steps in the procedure manual. A properly set up tray would establish the sterile field, distinguish it from the non-sterile areas and create boundaries of safety from infectious sources. Once the tray was prepared,

the nurse would not need to leave the bedside; the unit was intended to be self-contained. "We had trays that were set up you know . . . and there was a tray for setting up intramusculars or just anything. We were supposed to set up our own trays. But we had to know what they needed. And we didn't have all the prepared trays that they do now in the hospital. We had to know what should be on the tray and what might be needed."⁵³

The process of preparing the tray served the purpose of familiarizing the user with the contents and the process of the procedure. Handling the equipment contributed to manual dexterity through knowing the possibilities and limitations it imposed on the user. The importance of this manual knowing was articulated by a nurse who returned to practice when disposable and plastics had replaced the original style of trays: "Be prepared . . . to be hung up in the disposable plastic age Because the feel of things has changed. Glass, rubber, and steel had a familiar weight and balance to them. Plastic is much lighter, more balky, more unpredictable."⁵⁴ A cartoon from the *American Journal of Nursing* (figure 1), illustrated in popular format, this change in the feel of equipment.⁵⁵



"EVERYTHING feels weightless; it's plastic."

Illustration 3. The Feel of Things. Taken from Elizabeth Worley, "Monsters, Monitors, and the Merry Mouseketeers," *American Journal of Nursing* 69, no. 7 (July, 1969): 1444. Used with permission of Lippincott-Raven Publishers.

Once the tray was prepared, the blood needed preparation. Warming the blood was an expectation but not an exact science in the 1940s. "Our job was to see that [the blood] was warmed up before we gave it to the patient and have it ready when the doctor arrived to start it. . . . We used to set them [flasks, then later, bottles of blood] in a basin of warm water. . . . You knew it couldn't get too hot . . . so you just put them into warm water and let them sit there for a little while. You were trying to get them to room temperature."⁵⁶

Assisting

With preparations completed, nurses assisted either the intern or physician in giving the transfusion. One nurse gave a typical description as "You watched, you assisted again with starting the transfusion, . . . keeping the flasks filled, watching for any signs of reaction and then of course, discontinuing it." She added that "we were taught again in the classroom--what you did in order to assist the doctors . . . the tourniquet . . . , you laid that out for the doctor and laid the patient's arm on it and all he did was tighten it up where he wanted it and then he took the things away afterwards."⁵⁷ As transfusion was often done in the operating room, assistance would have also included positioning the patients (donor and recipient), cleansing the skin at the site, and administering stimulants to the donor as required.

After initiated, the challenge became how to maintain the transfusion without the containers becoming empty between units of blood. Blood was stored in refrigerators and could only be removed and warmed just prior to its administration. Timing was essential. For students managing the care of a ward with responsibility for eight to sixteen patients, "it always seemed to us that [patients receiving blood] were in the end rooms [of opposite corridors]--so you were running from one to the other. You didn't dare phone an intern and say that I let this run dry."⁵⁸ If the container emptied, the tubing and needle would become clogged and useless. It would mean re-starting the transfusion at a new site which would only complicate things further.

Cleaning up

Much of the scientific foundation underlying nursing was manifested in their cleaning roles.⁵⁹ This early period in transfusion preceded the antibiotic era when Penicillin was released for civilian use, only under restricted circumstances. Antisepsis and asepsis were the primary lines of defense against blood-borne bacterial and viral infections—and septicemia brought grave consequences. The cleaning process for transfusion equipment was particularly involved and labor-intensive, since the equipment (including the rubber tubing and needle) was reused. Nurses completed this cleaning on the wards prior to returning the articles to the blood bank for sterilization.

One nurse will never forget the effort it took and the rigor of the inspection before the job was finished. "The big job (that we all just loved). . . was cleaning these sets afterwards to send them up to get them ready for the next one cleaning the tubing and these long flasks. You couldn't even get your hand into them, they were so narrow. There couldn't be a mark on them anywhere. They [the night supervisors] used to hold these [flasks] up to the light, and look at them before they'd roll them up to go to the O.R. to be autoclaved for the next person. And you just had to wash and shine these, and make sure there was nothing left around."⁶⁰

A technologist who worked in the Blood Bank also recalled being responsible for cleaning transfusion equipment for the donors who were bled in the Out Patient Department: needles were sharpened for reuse, tubing rinsed in cold water and a variety of solutions, bottles washed—all equipment was wrapped and sent to the operating room for sterilization. One nursing sister who administered blood plasma in a Belgium field hospital, recalled that her chief delight was finding that she no longer had to clean up after the procedure was completed! The transfusion equipment came packaged in a metal box as a self-contained unit. Everything was returned to the box and sent back to supplies. She had no idea who cleaned it, but was relieved not to do it herself.⁶¹

While these nursing roles of preparing, assisting, and cleaning were adequate during a time of limited blood use, physicians soon needed to consider delegating additional responsibility to nurses. The hospital minutes and reports recorded that, "A shortage of interns has compelled nurses

to undertake many procedures normally performed by physicians."⁶² It is also feasible to suggest that as technologies became routinized, physicians lost interest in them. Transfusion was not the only technology which was shifting across the boundaries between medicine and nursing. Soon to follow, would be injection by the intramuscular and intravenous routes, blood pressure monitoring, and oxygen therapy. "Modern treatments demand increased nursing experience and time In one department for one twelve hour period might be cited one hundred and eight hypodermics formerly administered by interns, [which] due to a change in policy became the responsibility of the nurse."⁶³

During this introductory period, blood transfusion was a new technology for physicians and nurses alike. It complicated and impinged on nursing care in general, because of the need to prepare, assist, and clean up with the procedure as well as to organize the rest of nurses' work around the process. Involvement at this limited level allowed nurses to begin building an experiential base for the theoretical and practice knowledge which would follow during the period of delegation.

Work Patterns Prior to 1949

The proper role for women of late Victorian society was that of moral agent. Home building equated to nation building, and the proper sphere for woman's activities was the private one. As women's work in the public sphere became increasingly accepted after the turn of the century, middle class daughters increasingly engaged in paid work before marriage, as a matter of choice—instead of necessity. Training schools provided supervised, protected transitional environments for women moving from the domestic to the public sphere and nursing made an acceptable career choice as well as ideal preparation for marriage roles.⁶⁴ In the profession, nurses could continue to enact their moral agency as women, their spiritual calling and mandate to discipline patients. The emphasis within nursing was on women's character traits: efficiency, obedience, selflessness, iron constitution, natural instinct for motherhood and nurturing. The hospital's image as a family reinforced the roles of mother nurse, with loyalty to both the physician and the patient (a

sometimes conflicting role to take). In relation to the physician-father image, the nurse was to give regular reports, initiate treatments, remind the doctor, anticipate his decisions, manage the patient's regimen, and save the doctor time. Nurses training would reinforce the womanly character as a dutiful, informed, disciplined worker. The ideal nurse made the ideal woman and vice versa.⁶⁵

Few graduate nurses found employment in the hospital setting and those who did, were promoted away from the patient, into areas of supervision and education. Although there were no legal or professional sanctions against married nurses, typically they left the profession (as did women in other occupations). Conditions of employment did not accommodate family life and child bearing to the extent that nurses needed.⁶⁶ An excellent example of the strongly connected perception of nursing as preparation for motherhood can be noted in the OCH twentieth-anniversary report. Speaking of the reported births by former students who had graduated since the school's opening, "we know there are at least 458 children who should be good Canadian citizens because their mothers had been trained to care for them."⁶⁷

From the massive unemployment of the 1930s, the profession entered a period of chronic nursing shortages that would last at least four decades. Ruth Pierson's analysis of women's roles in Canada during the World War II, noted that military recruitment and the war industry put an end to unemployment in general, and offered increased opportunities for women specifically. Women were mobilized and actively recruited for the military, for industry, for positions in the service sector which had been vacated by men, and for volunteer work.⁶⁸ Nurses were part of the mobilization efforts in both military and civilian settings which experienced the onset of a chronic nursing shortage. Married nurses had to be actively recruited; hospitals faced such shortages that they modified working conditions, permitting shifts as brief as four hours, to get through the peak periods of patient care.⁶⁹ But once the war ended, these nurses returned to the home again. Of the 909 nurses who graduated from the OCHSN over the first twenty years, only 315 were still practicing in 1944. This number included practitioners in private duty, public health, industry, doctors' offices, mission fields, and air transport.⁷⁰ By inference, not many graduate nurses remained at the bedside

in order to build practice expertise. On the other hand, changes which women had experienced during wartime also created a social acceptability for nurses to remain employed, and as a gender-stereotyped profession, nurses were not in competition for jobs with returning military men.⁷¹

The development of expertise required a degree of work continuity which was not typical of nurses or women in general during the first half of the twentieth century. One result of conventional employment patterns plus the conditions prevalent during the war, was that nursing care at the OCH was delivered primarily by a student labour force. These were learners with heavy responsibilities for large numbers of patients. One instructor recalled her ambivalence in introducing a student just out of the preliminary period (the first 5-6 months of training), to her assigned ward of 16-20 patients with only occasional assistance of an orderly shared with other wards.⁷² Mastery of techniques was essential for survival and little time or resources were available for conceptualization of knowledge. The experiential knowledge that could have come from nurse educators, mentors and role models was either minimal or absent. Nursing knowledge was continually re-invented at novice levels because of the constant turnover in student care givers.

As well, nurses used withdrawal from practice as one means to express their resistance to employment conditions: "Advances in medicine and surgery have provided such complexities in nursing service requirements, and such increased responsibilities, that graduate nurses avoid hospital work."⁷³ In 1948, there was an eighty-six per cent staff turnover, attributed to the nature of hospital work and the lack of suitable financial compensation. In 1949, the nursing shortage was particularly severe; students who had trained at OCH took positions elsewhere, where working conditions were better (such as eight hour shifts and forty to forty-four-hour-work weeks). A year later, the OCH also introduced the forty-four-hour week, in an effort to retain their own graduates. As another strategy, the hospital hired nurse technicians to be responsible for all of the intravenous and intramuscular medications, and to assist with blood chemistry work, for the stated purpose of decreasing the work load of the general duty nurse.⁷⁴

The conventional pattern of women's employment and nurses' responses to working conditions in the hospital during the 1940s, constrained knowledge development. Although hospitals began to seek employment of more graduate nurses, there remained a chronic shortage—nurses were not available to be hired under the conditions which existed. Hospitals began to articulate a need for technological expertise and to find ways to provide for it by the end of the 1940s. Meanwhile, the predominantly student labor force was able to provide care only at the novice level of knowledge and skill. For them, technology was limited to the first and second levels of involvement which pertained to equipment and procedures.

Patient Perspectives from a Judicial Inquiry

Toward the end of the 1940s, the strain of nursing shortages, novice care giving by students and increasing demands for both general and technological services, led to conditions at the OCH which the public found intolerable. Two editorials in the *Ottawa Citizen* in early 1949 precipitated a request for a judicial inquiry into the state of care at the hospital. The first editorial began by discussing the cost of hospitalization, but then related concerns over cost to the concerns for conditions at the hospital: "Patients apparently are suffering unnecessarily and are often getting service far below the minimum standards called for. It is widely alleged that nurses are not available when patients urgently need them . . . unless [patients] retain a private nurse they can never be sure of receiving the attention their condition requires."⁷⁵ In the second editorial, the hospital trustees were accused of "whitewashing itself without more than a cursory 'investigation'. . . at a closed meeting in a board room . . . and should be made the subject of an independent inquiry."⁷⁶ The editorial then summarized twelve cases of patients who had been in the hospital over the past two years. All twelve cases involved aspects of nursing which ranged from medication issues, to inexperienced staffing, to prolonged waiting for assessment and care.

At the request of the Board of Trustees, the City Council requested an inquiry into the "truth or falsity of allegations of inefficiency on the part of the administration and management and of the

medical and nursing staff"⁷⁷ Three local newspapers announced the inquiry meeting dates and invited citizens to give testimony. The inquiries were held on March 28 and 29, April 11 and 12, and May 12 and 13, 1949 with His Honour, Judge A. G. McDougall, Judge of the County Court of the County of Carleton presiding. The counsel for the inquiry was G. Medcalf, for the *Ottawa Citizen* was J. W. Pickup, and for the hospital was A. W. Beament. More than seventy witnesses (including nurses, physicians, and administrators) gave evidence--some of their own accord, some under subpoena. Their evidence afforded an excellent view of the patients' perspectives of care during this time, although the judge found that "these charges are not substantiated by the evidence and do not exist in fact."⁷⁸ Counsel for the hospital dismissed the patient stories on the basis that they were 'an inexperienced source'.⁷⁹ Likewise, evidence was dismissed by the physicians: "It is easier for us in the medical profession, we know what is important and what isn't."⁸⁰

In his final report, Judge McDougall gave his opinion that, "I do not think any good purpose would be served by analyzing the evidence given by witnesses in detail and dealing with each individual case." He summarized confounding factors in the evidence as: the witnesses "were not at that time in a normal state of health, and there is always the possibility that their physical and nervous system would be so upset as to make it difficult for them to form reasonable conclusions;" some witnesses were "under the influence of sedatives or other drugs" when in the hospital; and some witnesses, "it is natural to expect, would be unreasonable as to the demands they would make upon the staff of the hospital when they were patients."⁸¹

Witnesses frequently prefaced their testimony by designating their status as either public or private patients, as though to lend weight to their experiences. Private patients paid for nursing care individually or by private insurance while public patients did not. Interns and residents (under the guidance of teaching physicians) attended public patients and in an emergency, they could attend the private patients as well. In general, private patients were satisfied with the medical and nursing care.

Public patients told a different story. These patients gave testimony of long waits for care, inexperienced nurses, dirty wards, missing services, prolonged pain and suffering related to delayed or omitted medications, medication error, being in danger for lack of observation by nurses during post-anaesthetic recovery and during hemorrhage, and retaliation by nurses for verbalized complaints. One patient reported that she had been injected with a virus during a blood transfusion, which resulted in contracting "cirrhosis of the liver."⁸² Another patient testified that she was accused by the nurse of "trying to get out of taking medications."⁸³ She had refused to take a drug which had not actually been ordered for her, although the nurse tried to persuade her to take it.

The breast-feeding mother of a critically ill baby reported that she remained in their private room without food or sleep for several days, in order to be with the child. The mother was afraid that if she went out for food, she would not be allowed back in, commenting, "I couldn't trust the hospital."⁸⁴ Another child was discharged after a tonsillectomy, hemorrhaged at home, and returned to the hospital for a transfusion; the child's mother charged that she had not been given adequate information nor advice regarding the normal post-operative expectations.⁸⁵

One former patient testified that she was told to watch her intravenous infusion closely, to monitor the fluid level and rate through the night. She explained the nurse had trouble regulating the rate to flow at sixty drops per minute; at times it would slow to twelve drops while at other times, the fluid level would be too low and the patient would need a new venipuncture to re-establish the line. The woman said, "Every time it was changed, it would mean putting another needle in because the next bottle of intervenous [sic] wouldn't run They wanted me to watch the intervenous [sic] all night, and I had to stay awake to watch it, otherwise it would run dry . . . I was too scared to sleep."⁸⁶

Some of the evidence pertained to relationships between physicians and nurses. One nurse who was subpoenaed, related that she had given information to a mother about her infant's feeding. When the physician found out, he commented that "the nurse had been working there too long. I was to be kept in the dark as to what my baby got." Subsequently, the nurse was 'let go'.⁸⁷ In another case, a student nurse disagreed with the method of bandaging ordered by a physician; she

proceeded to do it her own way after he left the room and told the patient "she knew more about putting bandages on than that old fuss-pot of a doctor of mine."⁸⁸

Fear of retribution was another theme running through the witness' testimony. When a visitor questioned a nurse about why a patient's emesis had not been cleaned up, the patient claimed that the "nurse raked me over the coals."⁸⁹ Still others testified: "the nurse would take it out on me if I or anyone else complained;" "she regularly bawled me out . . .;" and "when the nurse changed the bed she was mad and grumbling to herself, and threw me around in the bed."⁹⁰ When questioned by counsel, some of the witnesses declined to comment, stating they might need to be patients of the OCH or of their particular physician again in the future and preferred not to jeopardize their care.

Although Judge McDougall declared the allegations to be unsubstantiated, he did comment on two serious issues for the hospital. There was a severe shortage of nurses and nurses were "very very seriously overworked."⁹¹ He went on to point out the high proportion of student to graduate nurses (although this ratio was changing), and the difficulty in hiring nurses. He further suggested that the perfect (although impractical) solution would be to have a private nurse in attendance for each patient at all times. While no rationale was stated for this solution, it was significant in identification of the private nurse as the ideal care giver; beyond the obvious implication for individualized attention, it was the private nurse who was able to build knowledge based on experience in practice beyond the novice level.

Within the larger context of the inquiry and the patients' stories, one can find aspects related to transfusion and nurses' roles to technology in general. Blood was used for babies: "the nurse was pepping them [twins] up with blood transfusions the day before discharge."⁹² When blood was transfused for another child, the physician explained that it was used "for its strengthening value and it [sic] food value in treatment of serious illnesses, particularly diarrhea in children."⁹³ As in the case cited previously, blood was also known and acknowledged as capable of causing liver damage.

These patients' stories revealed that there was a two-tiered health care system : one level of care for patients who could pay for private, graduate nursing care and one level of care for patients

who were cared for by a novice student labor force. In the hospital domain, patients were vulnerable to the power of both the physician and the nurse. Access to information could be withheld; patients feared actual or potential retribution; and tight controls over visitation privileges could enforce compliance to the hospital culture. Finally, contrary to an educational system and a practice system which aimed at producing nurses who were technologically efficient, standardized, and interchangeable, patient stories demonstrated that "it all depended on the individual nurse," for the quality of care received.⁸⁴

Summary

Taking on technological roles and responsibilities offered an opportunity for the medical and nursing professions to meet at the technological boundary; it was here that curing activities overlapped and blurred. This change was clearly expressed in the 1948 HAR: "Granted the doctor comes first always when we think about the healing of the sick. But those of us who are much around hospitals place the nurse up very close to the doctor. The duties and responsibilities of a nurse have been expanded immensely by the new methods of healing. She has now to be expert and knowledgeable in many things. She has become a high-class technician and nursing is a real profession."⁸⁵

During the introduction of transfusion as a medical therapy, nurses were involved with the technology through roles that were restricted in a number of ways. There was a noticeable trend for lectures to be given at the cellular level, practice to be supervised at the procedural level, and the majority of student time to be spent at the service level. Nurses found that, like other technological innovations, transfusions complicated patient care but were invisible. "It would have been very inconvenient for all concerned if the nurses had not known a good deal about the apparatus used . . . but the fact that they did know was probably never noticed."⁸⁶

The roles which nurses assumed were also constrained by their work patterns. Without continuous, long-term employment in the profession, expertise was difficult to develop. Social

expectations for married women, war time opportunities, and nurses' dissatisfaction with the conditions of employment contributed to a chronic shortage of nurses. Patients responded to the shortage and to the novice level of care provided by students, by expressing their concerns in the media and law courts.

Hospitals faced a dilemma, with increasing demands for medical and nursing care, an inadequate supply of nurses, and increasing technologies--which would require greater expertise than students alone could provide. In the 1947 graduation speech, Chairman of the Board of Trustees E. Norman Smith admonished the audience: "Modern medicine, modern surgery, modern treatment with wonder drugs that are highly dangerous when improperly used make it imperative that nurses of the first grade shall be intensively trained."⁹⁷ Although conditions had situated nurses for taking on different roles and responsibilities, in this early period of transfusion technology, their roles were restricted by influences over knowledge development, by their obligation to care and cure in the midst of technological innovations, and by their work patterns.

Endnotes

1. William H. Schneider, "Blood Transfusion in Peace and War, 1900-1918," *Social History of Medicine* 10, no. 1 (April, 1997): 120, 121.
2. Ibid., 126.
3. "Sixty Years of Caring: The Ottawa Civic Hospital," (na, nd), OCHA.
4. Two previous histories have highlighted a chronology of persons and events associated with the Lady Stanley Institute for Trained Nurses and the Ottawa Civic Hospital School of Nursing. The authors created descriptive accounts of selected key personnel, achievements, changes in physical settings, additions to services, curriculum content, and anecdotes. These accounts have made a valued contribution to alumnae and institutional memory in general. Refer to Madge Macbeth, *The Lady Stanley Institute for Trained Nurses* (Ottawa: The Lady Stanley Institute Alumnae Association, 1959) and Valerie Knowles, *Leaving with a Red Rose: A History of the Ottawa Civic Hospital School of Nursing* (Ottawa: Deneau Publishers and Company Ltd., 1981). The last class of the OCHSN graduated from both the hospital and from Algonquin College in 1974, when Ontario provincial regulations transferred hospital diploma programs of nursing to the community college system. At closure, the school had graduated over 4000 nurses which according to its officially-authorized history (Knowles, *Leaving with a Red Rose...*), made it the second largest school of nursing in Canada.
5. *The Lady Stanley Institute for Trained Nurses Annual Report for 1894*, p. 16, Bytown Museum Archives, File Box 17.
6. "Fisher's Folly": *A History of the Ottawa Civic Hospital, 1924-1984*, (Ottawa: Banfield-Seguín Ltd., na, nd), OCHA.
7. Data were extracted from the HARs, 1924 - 1974. The pattern of declining proportions of student nurses to graduate nurses in the provision of hospital nursing care, reflected the national trend. See Helen K. Mussallem's, *Royal Commission on Health Services: Nursing Education in Canada, 1964* (Ottawa: Queen's Printer, 1965):15 and 130-136. Interview and personal communications with Gwen Hefferman confirmed that the proportion of students to graduate nurses did not change substantially until the educational changes of the early seventies took effect when community colleges took over hospital diploma programs. She further described the experimental "Two plus one" diploma program which was in effect at the OCHSN during the 1960s. In this program, the course content was placed into the first two years of the program and the third year was a calendar year of clinical work, viewed as an internship year. Two or three supervisors would be on the units, but third year students essentially still comprised a major part of the nursing staff, providing coverage for all three shifts. When the last fully hospital-educated class graduated in 1973, there were 1106 graduate nurses on staff for the hospital which had a bed capacity of 982. Nursing students were no longer counted as part of the nursing service workforce.
8. HAR, 1944, 22.
9. "Sixty Years of Caring:..."
10. "Rules for Nurses: The Lady Stanley Institute Training School of the County of Carleton General Protestant Hospital," Ottawa: Crain Printers, Limited, n. d., 6, OCHA.

11. A small volume which was published first in 1901, revised and re-issued 36 times by 1931, related the importance of having some form of nursing reference for graduate nurses. The author described how she had kept a "memorandum book which became indispensable to me, and which I used until the leaves became worn and fell apart. I rewrote this memorandum book three times, and the task of its fourth rewriting made me wish that I had its contents in a form more easily preserved." From Amanda K. Beck, *A Reference Hand-book for Nurses* (Philadelphia: W. B. Saunders Company, 1931):15. Further corroboration of the importance of these notebooks made by students, is found in Kathryn McPherson, "Science and Technique: Nurses' Work in a Canadian Hospital, 1920-1939," in *Caring and Curing: Historical Perspectives on Women and Healing in Canada*, eds. Dianne Dodd and Deborah Gorham (Ottawa: University of Ottawa Press, 1994).

12. MacBeth, *ibid.*, 35-36.

13. *ibid.*, 37. Additional curriculum details are available in MacBeth's work, as well as in the "Prospectus of the Lady Stanley Institute Training School of the County of Carleton General Protestant Hospital," n. d. OCHA and the "Sixtieth Annual Report of the County of Carleton General Protestant Hospital," 1910, COA.

14. Nancy J. Tomes with Geertje Boschma, "Above All Other Things, Unity," in The International Nursing History Collective, Barbara L. Brush and Joan E. Lynaugh, eds., *Internationalizing Nursing: A History of the International Council of Nurses, 1899-1999*. In press.

15. Examples of these early texts which were available to OCH students during this time period, are: Isabel Hampton Robb, *Nursing: Its Principles and Practice for Hospital and Private Use*, 3rd ed. (Toronto: The J. F. Hartz Co., Ltd., 1914) and Diana Clifford Kimber and Carolyn E. Gray, *Text-book of Anatomy and Physiology for Nurses*, 5th ed. (New York: The Macmillan Company, 1920). In Kimber and Gray's first edition (1893), the authors declare their work to be "the work of a nurse for nurses," p. 4. These texts were among those used by the OCH SN (according to course outlines and purchase instructions for students) and retained in their archives.

16. Bertha Harmer, *Textbook of the Principles and Practice of Nursing* (New York: The Macmillan Company, 1923).

17. The Lindeman method used multiple syringes: 30 cc of blood was removed by syringe, handed to an assistant who injected it into the patient, the assistant then handed the syringe to another assistant who washed it in saline and returned it to the physician for the next withdrawal. The success of this 'chain system' depended on speed and the availability of a team of at least three operators. See Victor Horsley Riddell, *Blood Transfusion* (London: Oxford University Press, 1939): 195. A graphic description of the Unger method is presented Norman Miles Guiou, *Transfusion: A Canadian Surgeon's Story in War and in Peace* (Yarmouth, Nova Scotia: Stoneycroft Publishers, 1985): 86. Guiou trained with Dr. Lester Unger in Harlem during the early 1920s. The Unger method required a syringe, connecting tubing, special needles and a stopcock. The donor and recipient were placed head to foot, beside each other, arms extended toward each other in the middle. The needle and tubing remained in place while the stopcock was employed to direct the blood flow from one, into the other. And the citrate method was the third or newest method, in which small amounts of anticoagulants were used directly into the donated blood. The citrate method required careful measurements and a nurse to stir the blood with a glass rod during the process.

18. Bertha Harmer, *Textbook of the Principles and Practice of Nursing*, 2nd ed. (New York: The Macmillan Company, 1932).

19. Joseph B. DeLee, *Obstetrics for Nurses*, 10th ed. (Philadelphia: W. B. Saunders Company, 1934): 319.

20. Notes for a lecture on blood, prepared by B. Jean Milligan are in the OCHA files. Sample copies of the school's exams and of the Ontario Nursing Exams (1926-1941) are also contained in the files.

21. Refer to *Canadian Nurse* articles: Marie Breithauff, "Indirect Transfusion," 35, no. 2 (February, 1939): 73-75; J. R. Goodall, F. O. Anderson, G. T. Altimas, and F. L. MacPhail, "An Inexhaustible Source of Blood and its Preservation," 35, no. 5 (May, 1939): 252-258; David P. Boyd, "Blood Transfusion," 38, no. 6 (June, 1942): 388-392.

22. Boyd, "Blood Transfusion . . .," 391.

23. From the *Canadian Nurse*: Frances Brown, "A Blood Donor Service in Halifax," 38, no. 11 (November, 1942): 872-874; Helen Marie Caraher, "An Emergency Splenectomy," 37, no. 3 (March, 1941): 185-186; E. Gertrude Ferguson, "The Almonte Disaster," 39, no. 2 (February, 1943): 117-118; Dorothy Thomas, "An Interesting Surgical Case," 41, no. 6 (June, 1945): 455-457; and Gordon Wilson, "Blood Transfusion in a Gynaecological Service," 38, no. 12 (December, 1942): 921-923.

24. Typical of these were: Anonymous, "Blood for Britain," 36, no. 12 (December, 1940): 804-806; J. A. MacFarlane, "Trends in Military Service," 37, no. 2 (February, 1941): 97-99; Kathleen Nairn, "Blood Donors Needed," 41, no. 3 (March, 1945): 202; E. J. Pampana, "Scientific Progress and the Victims of the War," 41, no. 1 (January, 1945): 45-49; S. R. Townsend, "Recent Advances in Hematology," 40, no. 3 (March, 1944): 171-172; and Sister Margaret Mooney, "Routine-but 'Stat'," 40, no. 7 (July, 1944): 472-476.

25. The newsletter of the OCHSN was begun in 1938, to stimulate interest in the alumnae association, and continues to be published semi-annually. The issues between 1940 and 1945 mention nurses who did volunteer work for the CRC blood donor clinics, as does a list of the membership's activities created for a 1948 reunion ("Class Re-union 1928-1948"). Copies of the newsletters and lists have been retained by the OCHA.

26. E. Stanley Ryerson, "The Preparation of a Curriculum," *Canadian Nurse*, 25, no. 9 (1929): 535-540.

27. Ryerson, 539.

28. Kathryn McPherson, *Bedside Matters: The Transformation of Canadian Nursing, 1900-1990* (Toronto: Oxford University Press, 1996): 112.

29. Milligan, interview.

30. Milligan, interview.

31. Milligan, interview.

32. HAR, 1929, 13.
33. HAR, 1932, 13.
34. Procedure books have been retained in the OCHA. The earliest one found was not dated, but carried the notation that the procedures were in effect prior to 1948. In a personal communication with the author, Jean Milligan confirmed the use of a procedure from the beginning of the school and that Miss Edith Young updated and greatly elaborated this procedure book, when she became Director of Nursing Service and Nursing Education in 1946. Given the later issues which surrounded the Judicial Inquiry into the standards of nursing care at the OCH, it is probable that this major revision was stimulated by her concerns over the standards and the legal accountability of the school of nursing.
35. Minutes of the City Council, 2 August 1949, COA.
36. Milligan, interview. The term 'follow up' instructor appeared in school of nursing minutes and hospital reports. It referred to nursing instructors who moved between the wards, assisting students with procedures and skills which were either new or unfamiliar to them. An interesting implication of the term is that it assumes something has been taught prior to the application which is to 'follow up.'
37. A collection of these manuals may be found in the OCHA.
38. Procedure books, OCHA.
39. Milligan, interview.
40. Betty Campbell, Nursing sister, Canadian Forces Medical Services, personal communication, 19 March 1998.
41. "Who Sheds His Blood," NA Documentary Film and Art, ISN 160916.
42. Milligan interview; Hallie Sloan, personal communication with the author, 15 March 1998; Helen Mussallem, personal communication with the author, 15 March 1998; and Betty Campbell, personal communication with the author, 19 March 1998.
43. Sloan, personal communication.
44. Milligan, interview.
45. Credit for the first blood bank and coining the term, is generally given to Dr. Bernard Fantus, Cook County Hospital, Chicago, Illinois. See George Milles, Hiram T. Langston, and William Dalessandro, *Autologous Transfusions* (Springfield, Illinois: Charles C. Thomas Publisher, 1971): 5-6 and Helen Young, *Essentials of Nursing* (New York: G. P. Putnam's Sons, 1942).
46. T. G. Jones, personal communication with author, Ottawa, 12 April 1998.
47. Milligan, interview.

48. Helpful discussions of the efficiency movement (also referred to as Taylorism after engineer Frederick W. Taylor) can be found in Joel D. Howell, *Technology in the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore: The Johns Hopkins University Press, 1995): 30-32 and in Susan Reverby, "A Legitimate Relationship: Nursing, Hospitals, and Science in the Twentieth Century," in *The American General Hospital: Communities and Social Contexts*, eds. Diana Elizabeth Long and Janet Golden (Ithaca: Cornell University Press, 1989): 142-143.
49. HAR, 1938, 14.
50. Milligan, interview.
51. Minutes of the Committee on Nursing and Allied Services, 13 November, 1945, located in Miss Bennett's file on "Conferences and Correspondence with Nursing Committees," COA, OCHSN box 9.
52. Milligan, interview.
53. Isabel Simister, interview by author, tape recording, Ottawa, 22 January 1998.
54. Elizabeth Worley, "Monsters, Monitors, and the Merry Mouseketeers," *American Journal of Nursing* 69, no. 7 (1969): 1443-1445.
55. Ibid., 1444.
56. Milligan, interview.
57. Milligan, interview.
58. Milligan, interview.
59. This important argument has been put forward by Kathryn McPherson in *Bedside Matters: . . .* 86-89, as part of nurses' fundamentally different way of relating to science.
60. Milligan, interview.
61. Hallie Sloan, former Matron-in -chief, Canadian Forces Medical Services, personal communication, 15 March 1998.
62. HAR, 1946, p. 42.
63. HAR, 1947, 49.
64. Beverly Boutilier, "Helpers or Heroines? The National Council of Women, Nursing, and 'Women's Work' in Late Victorian Canada," in *Caring and Curing: Historical Perspectives on Women and Healing in Canada*, edited by Dianne Dodd and Deborah Gorham (Ottawa: University of Ottawa Press, 1994).
65. Barbara Bates, *Bargaining for Life: A Social History of Tuberculosis, 1876-1938* (Philadelphia: University of Pennsylvania Press, 1992) and Boutilier, "Helpers or heroines? . . . "

66. McPherson, *Bedside Matters: . . .*, 166 and 218-219.
67. HAR, 1944, 24.
68. Ruth Roach Pierson, *Canadian Women and the Second World War*, historical booklet No. 37 (Ottawa: Canadian Historical Association, 1983): 3.
69. Milligan, interview; HARs for 1939, 1941, 1943, 1944, 1949. The issues around nursing shortages and the employment of married nurses to fill shortages was an on-going on; concerns are still evident in the HARs of 1960 when the first nurse refresher course was organized to recruit married nurses back to the hospital and 1965 when a major policy change was made to allow married students to return and complete their nursing program. Corroboration can be found in the statistical information and the discussion portions of the national nursing study: Helen K. Mussallem, *Royal Commission on Health Services: Nursing Education in Canada*, 1964 (Queen's Printer, 1965) and the provincial nursing study: V. V. Murray, *Nursing in Ontario: A Study for the Committee on the Healing Arts* (Toronto: Queen's Printer, 1970).
70. HAR, 1944, 24.
71. For fuller discussion of changes in women's roles, refer to Ruth Roach Pierson, *Canadian Women . . .*; Robert Bothwell, Ian Drummond, and John English, *Canada Since 1945: Power, Politics, and Provincialism*, rev. ed. (Toronto: University of Toronto Press, 1996); and Alison Prentice, Paula Bourne, Gail Cuthbert Brandt, Beth Light, Wendy Mitchinson, and Naomi Black, *Canadian Women: A History* (Toronto: Harcourt Brace Jovanovich, 1988).
72. B. Jean Milligan, personal communication, 13 April 1998.
73. HAR, 1949, 38.
74. *Sixty Years of Caring . . .*
75. Editorial, *Ottawa Citizen*, 28 February 1949.
76. Editorial, *Ottawa Citizen*, 4 March 1949.
77. "Civic Hospital," Minutes of the City Council, 2 August 1949, pp. 662-676, COA.
78. "Civic Hospital . . .," p. 663. In addition, three volumes of evidence offer insight to care and concerns of these patients. Refer to the files on "Judicial Inquiry, vol. I-III," COA, MG 38, vol. 36.
79. Judicial Inquiry, vol. II: 38.
80. *Ibid.*, 156.
81. "Civic Hospital," Minutes of the City Council, 2 August 1949: 669, COA.
82. Judicial Inquiry, vol. I: 136-138.
83. *Ibid.*, 80.

84. Ibid., 47.
85. Ibid., 152.
86. Judicial Inquiry, vol. III: 202-203.
87. Ibid., 65.
88. Judicial Inquiry, vol. II: 5.
89. Ibid., 6.
90. Judicial Inquiry, incidents taken from vol. III: 9, 10, and 204.
91. "Civic Hospital . . . ," 673.
92. Judicial Inquiry, vol. I: 52.
93. Judicial Inquiry, vol. III: 189.
94. Ibid., 37.
95. HAR, 1944, 23-24.
96. Esther Lucile Brown, *Nursing for the Future: A Report Prepared for the National Nursing Council*, (np,1948): 81, OCHA.
97. E. Norman Smith, "Should Nursing Be Made a Profession Like Medicine?" *The Ottawa Journal*, 12 June 1947.

Chapter 4

DELEGATED, SANCTIONED, TRANSFERRED, AND ADDED: 1950-1970

Conditions at the Ottawa Civic Hospital (OCH) and health care in general, revealed a system under strain by the 1950s. A rising birth rate, innovations in medicine and surgery, and the expansion of both hospital insurance plans and hospital facilities were among influences on the 'demand for care' side of the issue.¹ Influencing the supply side was a shortage of both interns and nurses, and an inexperienced student work force. Over the next two decades, hospital administrators and nurses worked at finding solutions which would produce more graduate nurses, retain nurses in practice, and restructure roles to make better utilization of those already employed.

By 1970, specialty units such as the recovery room, intensive care units, and coronary care units had become vehicles for expanded nursing roles. The clustering of equipment and expertise in centralized geographical areas of a hospital was key to these units.² Here the technological line between curing and caring blurred and changing work patterns actually facilitated the building of nursing expertise although the internal work culture continued to undervalue and render invisible much of the bedside craft.

As nursing moved from its domestic roots into increasingly technological roles, the conventional boundaries between medicine and nursing began to blur, as did the boundaries between the art and science of nursing. By controlling the number of persons and the precise conditions under which they could assume certain roles, the delegation of medical acts simply formalized a process for the transition of technology to nurses. This chapter examines how blood

transfusion became delegated to nurses, how it shaped and was shaped by the changes in nursing practice and education, and how it structured the process for the delegation of other technologies to nurses. Analysis indicates that: delegation required nurses to construct practice knowledge integrated from a variety of formal and informal sources; delegation complicated patient care as well as patient and professional relationships; delegation stimulated nurses to develop self-protective strategies to deal with technology; and delegation was contingent on changes in nurses' traditional work patterns to provide a labour supply capable of taking on added roles and responsibilities.

Blood Transfusion in the 1950s and 1960s

Medical developments in transfusion continued to evolve in the areas of immunology and cross-matching, particularly in relation to the Rh factor and exchange transfusions in newborns. Laboratory tests for Rh were available after 1946, in time for the post-war baby boom. Whether it was coincidental or not, transfusion found a new application in the civilian population. Nurses recalled: "You had the little bitty babies in the nursery who would have the cord transfusions because of the Rh factor."³

Media headlines emphasized the role of the Canadian Red Cross (CRC) in saving babies lives as a technique to promote blood donations. A 1948 Toronto Star feature article pictured a chubby-faced, healthy-looking eight-month-old baby with this introduction: "Donald . . . is one baby in a million. The blood in his veins belongs to a stranger. The color in his cheeks is a gift of science. His robust health he owes to the Canadian Red Cross society, and his debt is one he can never repay if he lives to be as old as Methuselah. Jaundiced and pale, Donald was born with erythroblastosis fetalis"⁴

At the same time, the medical profession had to deal with increasing evidence of disease transmission by blood. Initial concerns were for the transmission of syphilis and malaria, but soon hepatitis and scores of other communicable diseases were identified as well. In 1953, a World Health Organization newsletter published an article on the dangers of hepatitis B.⁵ In 1961, a

Maclean's Magazine article stimulated a flurry of activity by the medical associations, when a physician suggested that "Three Blood Transfusions Out of Four are More Likely to Harm Than to Heal."⁶ A swift, negative response came from the CRC and the Canadian Medical Association to the magazine, to the physician author, and to the public.⁷ D. Bruce Shaw (President of the National Officers of the Canadian Red Cross Society in 1961), wrote to the editor of the magazine:

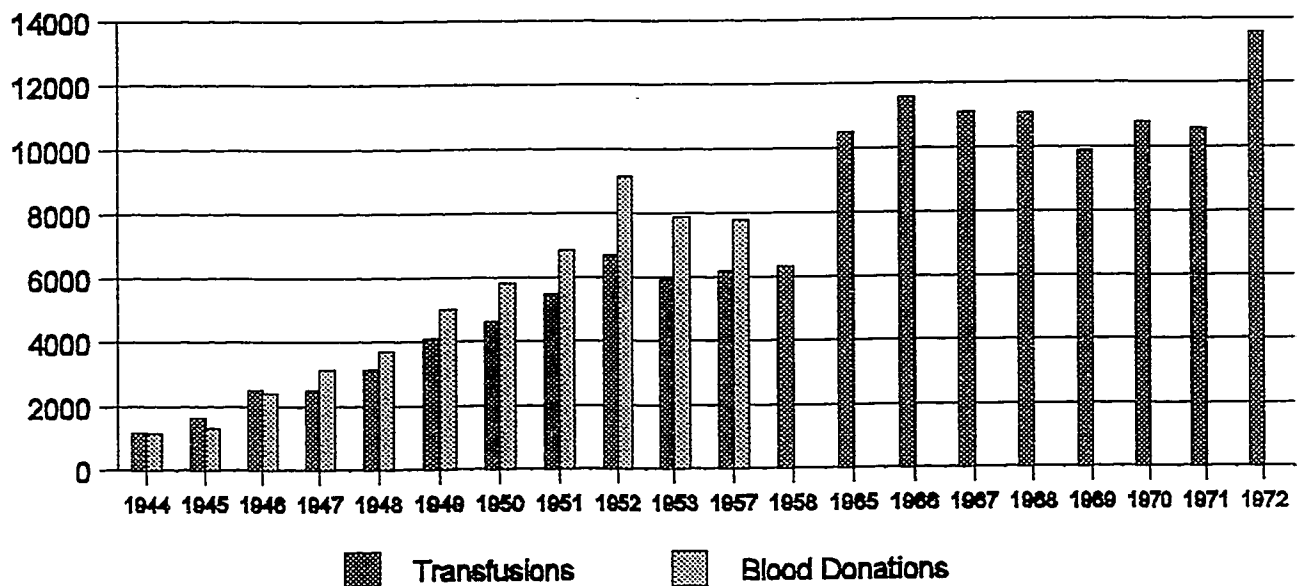
We are not primarily concerned with Dr. Bowman's unwarranted attack on his medical colleagues Our medical colleagues are quite capable of dealing effectively with Dr. Bowman and his irresponsible criticisms, as already exemplified by the immediate reaction of leading members of the medical profession We must, however, as administrators of Canada's national blood transfusion service, be very much concerned as to what effect such statements . . . , will have on our volunteer blood donors, on whom much of the practice of modern surgery, medicine, obstetrics and paediatrics depends.⁸

The next month, an eight-page editorial in *The Canadian Medical Association Journal* addressed the topic of "The Safety of Blood Transfusions," in which the unnamed author stated "it is an exercise of professional judgment for which only the physician is prepared."⁹ The rapid denunciation of the physician and lengthy counter argument was indicative of a growing concern over the safety of blood. No longer could blood be viewed as absolutely safe and life saving.

Articles in the *Canadian Nurse* during this era dealt with medical developments and added components from a nursing perspective. Topics included the importance of the Rh factor, erythroblastosis foetalis [sic], the use of gamma globulin in polio and hemophilia, recognizing and intervening in reactions to transfusions, and further articles on establishing and operating transfusion services. After the mid-fifties, articles that dealt directly with transfusion and blood declined in this nursing journal.¹⁰

Specific reference to 1698 transfusions first appeared in the 1936 report of the Pathological Department under the heading of "Number of Blood types for transfusions." The number of transfusions had increased to 4619 by the time of the Almonte disaster in 1942. According to the hospital annual reports from 1944 to 1958, the now separate Blood Bank submitted its own annual reports. Table 3 illustrates the rate of usage at the OCH based on these reports. Until 1958, when the CRC took over the blood supply, the hospital also collected blood from donors. Where the number of donations exceeded the number of transfusions, it is feasible that the imbalance provided an allowance for out-dated products and wastage.

Table 3: Number of Transfusions Based on Blood Bank Statistics, OCH Annual Reports, 1944-1972



After 1958, the hospital annual reports no longer recorded Blood Bank or blood transfusion statistics on a regular basis. No mention of transfusion was found after 1972. Interestingly, it was during this period that nurses on the Nurse Technician team took over responsibility for transfusions and even though records were still kept by the team, statistical documentation of blood use disappeared from the annual reports. At least three explanations may be posited: 1) the technology had become 'routine' and no longer a valued indicator of hospital efficiency and efficacy; 2) as nurses

took on the roles, blood assumed a lower profile appropriate to the hierarchical status of those who now implemented it; and/or 3) there was no need to report the statistics after the CRC assumed responsibility for the blood supply, which seemed to be limitless. The technology became less visible, less distinct--like many other nursing technologies.

According to the limited statistics from the annual reports, the incidence of transfusion at the OCH increased dramatically through the 1950s and 1960s. It was not possible to compare the number of transfusions to the hospital census for the same period; annual reports varied in the data recorded from the number of meals served in a year, to the average number of beds, and a variety of other surrogates for activity--depending on who created the report and what was considered either 'important' or 'creative' at the time. These reports did not indicate authorship. The Finance Office filed annual forms with the Ministry of Health, but lost the local records for the period preceding 1960 in a basement flood prior to this study. As well, information on transfusion was not required for submission.¹¹

Nurses commented that blood seemed to "flow freely", being used for purposes such as "building up" and "topping up."¹² Building up referred to the practice of giving blood for low hemoglobin levels--however different physicians used different criteria in making the decision. Sometimes the hemoglobin wasn't even evaluated, but the physician decided based on looking at the patient, a practice referred to as "'cosmetic transfusions' given only to bring a little color to the cheeks, more for the benefit of the relatives and the peace of mind of the doctor than for the patient."¹³

Some physicians ordered blood routinely (pre-operatively and post-operatively), as well as for obstetrical patients following delivery. "I think there was a period when transfusion was done for the sake of transfusion . . . it was deemed to be needed during surgery and you were typed and cross matched almost for all surgeries."¹⁴ Palliative care patients were also given blood to "improve their quality of life." Some referred to patients as needing a bit of "topping up."¹⁵ These utilization patterns led to blood supply shortages and complaints among physicians of abuse in the system.

A utilization study¹⁶ conducted at the OCH found there were definite practice variations among physicians which the pathologist offered to discuss individually with them. Among the recommendations for changes were: consistent criteria for transfusion needed to be established, greater discretion to be used in ordering blood, and junior staff were to receive "indoctrination lectures on blood transfusion."¹⁷ A nursing instructor at the time, suggested that motives for the study involved more than patient care issues: "[It] was strictly driven by economy--from looking at how we could be more cost effective and not be using all of the equipment."¹⁸

Delegation as a Regulated Process

In response to workload issues for both interns and nurses, the OCH Board of Trustees implemented a policy decision in 1947 which established the process for the delegation of medical acts, as a template for future acts to be 'delegated', 'sanctioned', 'transferred' and finally 'added' to nurses' scope of practice. It was made after much consultation over a period of years with the College of Physicians and Surgeons of Ontario (CPSO). The decision assigned responsibility for the administration of intravenous fluid and blood transfusion to a 'Blood Team' of two specific nurses (Miss Gourlay and Miss Moorehead), but the larger policy issue was delegation to nurses in general.

After 1947, the Blood Team assumed responsibility for managing transfusions at the OCH. While this model established the process for further delegation of medical acts to nurses, expanded roles and responsibilities which depended on nursing expertise were limited to a small core of designated persons as long as students delivered the majority of nursing care. Further transfer of responsibility did not take place until work patterns and student education patterns changed significantly in the 1970s.

Dr. H. William Henderson (Deputy Registrar, CPSO) described the historical development of delegation to the Ontario Hospital Association Convention of 1981. According to him, the extensive use of intravenous therapy in military hospitals and casualty stations during the war had set a precedent for civilian use of the same technology. But it required the additional impetus of a

shortage of 2,000 physicians in the province of Ontario after the war to bring the change. Henderson credited the request from hospitals for nurses to be permitted to give intravenous and blood infusions as the precipitating event for delegation: "The Council [of the CPSO] recognized the need for the College to approve the administration of intravenous fluids, including blood, by specially trained nurses on the order of a physician Doctors did not believe these responsibilities should be included in the regular duties of a nurse."¹⁹ Not willing to delegate the responsibility to all nurses, it was further recommended that "the medical superintendent of a hospital be permitted to designate one or more graduate nurses who had received special training by the medical pathologist or physician to give intravenous therapy." This training was to include written instructions and written orders signed by a physician. The nurse was required to remain in attendance during the administration of blood.

From this first officially-recognized delegated act, nurses would continue on the path of downloading medical or curing activities from physicians. By 1957, when the CPSO approved tuberculosis tests and immunization injections for administration by nurses, the Registered Nurses Association of Ontario (RNAO) officially protested that they had not been consulted. Their argument centered on the lack of training, lack of legal protection for the act, and that nurses were being asked to take on procedures considered outside the field of nursing. They also argued that with the continuing nursing shortage, these added acts were an unacceptable burden. The CPSO assured the RNAO that they would be consulted in future decisions.

A year later, the RNAO opposed the delegation of the administration of intravenous medications as a nursing role. The governing bodies reached a compromise expressed through a special statement which was jointly-issued as "Warning Notices." The statement "emphasized that the procedures which could be delegated were acts in the practice of medicine to be carried out by nurses where medical personnel were not available. The circumstances cited where such a delegation or responsibility would be acceptable were hospitals without interns, public health units and industrial medicine."²⁰ When the College of Nurses of Ontario (CNO) became the regulatory

body for professional nurses in 1961, it joined with the CPSO, RNAO, and the Ontario Hospital Association (OHA) in determining which acts could be included in nurses' scope of practice. The Ontario Medical Association (OMA) became involved through consultations by 1981.²¹

By 1964, delegated acts included such procedures as rectal examinations on antepartum patients, subcutaneous administration of uterine stimulating drugs, pronouncing the patient dead if the death was "not unexpected," and the withdrawal of blood by laboratory technologists (some of whom were registered nurses). As specialty units developed, further acts were delegated such as external cardiac massage, hemodialysis, epidural analgesia, management of gastric tubes and tracheotomy tubes (1967). Defibrillation and vaginal examinations were added in 1969 with further additions through the 1970s and 1980s. Interestingly, the CPSO also deleted acts from the list, when procedures became recognized and accepted as standard nursing practice. Even the process of deleting acts became complicated and "the cause of confusion to some who interpreted the omission of a procedure previously included in the guidelines as a reversal of policy, rather than the exclusion of an accepted nursing practice."²²

The number of delegated medical acts (DMAs) had increased to fourteen by 1967 and twenty-two by 1972. For nurses in specialty areas, an additional eleven acts were permitted, creating a two-tier system of delegation in which the specific setting within which an act could be performed, became a criterion for performance of the act. An act which was permitted for a nurse while in the intensive care unit, could not be performed by that same nurse on a general medical unit.²³

The Health Disciplines Act (HDA) of 1974 granted the CPSO legal authority to make regulations authorizing persons other than their members to perform specified acts in the practice of medicine under the supervision and direction of a member. The CNO took the position that delegation from medicine to nursing should continue to be a consultative process—that acts could be delegated but would also require the recipients' willingness to accept the responsibility. By the end of the 1970s, the CNO changed from use of the term 'special procedures' to 'sanctioned medical

acts' (SMAs) referring to an act delegated from medicine and accepted (or sanctioned) by CNO for nursing. The term 'added nursing skills' (ANS) was intended initially for reference to nursing acts which could be delegated by nurses to nursing assistants (adding a new level of delegation between levels of providers) but in actual use, came to indicate acts within the practice of nursing though beyond the basic skills required for entry to practice.²⁴ Delegated and sanctioned medical acts required teaching, return demonstration, written examination, and annual re-certification of competence. Added nursing skills required only the initial teaching and return demonstration.

With such a convoluted system of indicating which activities could be performed by a nurse and in which settings, the CNO decided to conduct a survey on 'technical nursing procedures' in 1975. The survey led to a jointly-approved policy statement of the four organizations (CNO, RNAO, OHA, and CPSO). The survey asked respondents (all university schools of nursing, all diploma nursing programs, all training centers, 179 hospitals and 50 nursing homes) to consider a list of 162 technical nursing procedures and designate the level of knowledge required and the level of teaching provided for each procedure. The options were: 1) the procedures are required/taught at a competence level; 2) theoretical knowledge only, or 3) the procedure is not taught/required in the agency.²⁵ Competence was defined as "the ability to perform the procedures safely without supervision or direction." From the results of this survey came the "Standards of Nursing Practice: for Registered Nurses and Registered Nursing Assistants" which served to guide educational curricula and nursing practice after 1976.²⁶ These standards divided nursing skills into three categories: basic nursing skills, added nursing skills and sanctioned medical acts--levels of distinction which were based on the educational requirements related to each.

Transfusion as an Exemplar of Delegation: The Blood Team

As the state of knowledge about blood evolved and the technical capability for storage and re-infusion existed, physicians no longer needed to be physically present during the process. Interns were not able to keep up with the frequency of transfusions especially after they also became

responsible for intramuscular injections (IMs).²⁷ The OCH Board of Trustees decided to address one of the workload issues for both medicine and nursing by designating two nurses as the hospital's 'Blood Team.' While it is easier to understand how delegating to nurses would reduce the workload for interns and physicians, it is more difficult to see how it was supposed to improve nursing workload.

In 1947, the OCH employed two nurses, specifically to manage blood transfusion technology and to alleviate an already over-stretched nursing service. In this manner, bedside nurses' workload would be less affected and the technique could be more strictly controlled. One nurse educator recalled "when there were two people on the team and then gradually they increased it up to four . . . But after a great many meetings, it was decided that because the blood was being ordered more and more, that this was something beyond the scope of what the nurses could handle (not what they could do, but what they could handle with the workload) . . . it was decided to have the team."²⁸

Miss Louise Gourlay and Miss Gladys Moorhead were graduates of the OCHSN who were practicing as private duty nurses when hired as the Blood Team. They remained in their positions for the rest of their careers, retiring at the end of the 1960s as Director and Clinical Director of the Nurse Technician Team (as it came to be known later). Initially, the Blood Team was available only during the day shift until the hiring of a third nurse (Miss Plunkett) increased the hours of coverage.²⁹ The concept of the Blood Team fit well within the functional delivery system of nursing at the OCH, representing yet another level of proficiency and advancement. It was appropriate for an environment oriented to efficiency where nurses were assigned to series of 'tasks' and where students learned by repetition of skills. "All we had to do was call the intravenous team to come and get the blood and then we just looked after the patient after they started [it]."³⁰

There were advantages for the patient in that the Blood Team was "more proficient because they did it all the time and it was easier on the patient actually The doctors were glad not to have to run away from the other things they were doing."³¹ One nurse recalled Miss Gourlay only occasionally saying, " ' I am going to have to come back because I can't get a vein.' But it didn't

seem to me that it happened too often. They were pretty good at it."³² One unanticipated result was that the interns and residents lost experience and expertise in venipuncture due to the role of the Blood Team. To partially compensate, the interns were assigned to rotate through a month's experience with the Team—physicians learned from nurses.³³

The Blood Team was responsible for initiating the venipuncture and hanging all of the units of blood: "They were very good in the beginning, in staying for a while with the patient and as soon as they saw that everything was going particularly according to the orders (as to amount and that the site looked fine), they would then speak to the nurse in charge of the patient and leave it with them until they could come back. They usually came around at least twice or three times in a day shift."³⁴ Initial expectations for the team also included assisting in blood chemistry work (taking blood samples).³⁵

Other technologies delegated to the team over the years, included the intravenous administration of antibiotics and chemotherapy, leg scanning following fibrinogen injection, and the management of central lines. As roles changed, the team was referred to as the Intravenous (IV) Team, the IV Technician Team and/or the Nurse Technician Team (Nurse techs). Only five years after the team was formed, Dr. Fisher reported to the General Medical Board of the hospital that: "The scope of the Blood Team has been enlarged, but the work increases as fast as suitable nurses can be secured."³⁶ He went on to praise their work, commenting on how they were "extremely alert to check on the techniques and the dangers of the materials they give." Fisher also reported how he believed that "fatalities may have been avoided because of a conscientious Blood Team."³⁷

In 1952, a letter to the Medical Advisory Board recommended hiring additional nurses "regardless of cost." It was pointed out that "the present system whereby typing, taking and administering of blood are all handled by different people qualified for only the one job is wasteful of time and increases the risk of error. Each nurse technician should be able to perform all of these tasks."³⁸ In this case, nurses were valued for their consistent presence and ability to multi-task.

The problem of insufficient, 'suitable nurses' continued and the Board was asked to consider "attaching senior pupil nurses to the Blood Team."³⁹ Although the motion carried, student nurses never actually became part of the team, likely due to the resistance and high performance expectations of Miss Gourlay and Miss Moorhead. As one nurse technician hired in 1964 explained, she was required to accompany one or the other of them, observing their techniques for one month before she was "allowed to even touch a patient."⁴⁰ The number of team members increased during the 1970s and 80s, eventually employing between twenty and twenty-five nurses.

Delegation facilitated a type of practice expertise not commonly found in the nursing profession during the earlier period of time when roles had been more restricted. In place of novice care providers, these nurses remained at the bedside building experience, expertise, and knowledge. Instead of moving away from the practice setting, these two women developed their art through the technological roles assigned to them as the Blood Team. They built a way of knowing and being proficient that integrated science with art, as did the small core of nurses under their supervision who became part of the team over time. Within nursing's work culture, the Blood Team commanded respect and was able to create a separate occupational space for itself. Members of the team had more independence in scheduling and hours worked, better conditions of employment, decision making with patient care, and more collegial nurse-physician relationships.⁴¹

Over time, the team reported first to the Pathology Department in the 1940s, then to the Laboratory Department in the 1950s, to Pharmaceutical Services in the 1960s (when intravenous and chemotherapeutic medications became part of their role), and finally to the Nursing Department as part of the 'Special Services' division in the 1970s (with the addition of central lines and total parenteral nutrition responsibilities, for examples). Each change in the line of accountability reflected changes in their roles. When the team came under the administrative umbrella of nursing service, according to one nurse technician, it lost much of the special status and privileges previously enjoyed.⁴²

The hospital annual report of 1962 noted that the nurse technician team had performed "approximately 81,000 intravenous procedures" that year. The report also claimed that the team conserved the physicians' time and added to patient safety and comfort by their expertise.⁴³ As transfusions increased and additional technological responsibilities were assumed by the Blood Team, staff nurses' work had to incorporate more of the supportive care and monitoring functions associated with blood. One nurse recalled that: "As soon as the Blood Team left, [the patient] became [the nurse's] responsibility. That was one of the hardest things to get nurses to realize. So many more people kept coming to the bedside and doing things that [nurses] thought, 'oh, this is something I don't have to look after.' But they really did have to look after it and you had to keep telling them."⁴⁴

Changes in the staff/student ratio also contributed to role adjustments through the late 1960s and early 1970s. The hospital hired several hundred graduate nurses in anticipation of the closure of the school of nursing, creating a predominantly graduate staff for the first time in the hospital's history. In addition, as technologies proliferated in a teaching hospital which had grown to over 1100 beds, the relatively small group of designated nurses were unable to keep up with the demands for more specialized roles.⁴⁵

Parallel examples of delegation

During this period, transfusion provided a model for the incorporation of other technologies such as taking blood pressures and giving intramuscular injections. Blood pressure measurement was a physician's responsibility in the 1930s, as long as it involved directly accessing a vein by means of a manometer, fluids, and stopcocks attached to a needle.⁴⁶ When equipment for non-invasive measurement became available, the technique remained a medical procedure at the OCH until 1954 when nursing instructors began to teach students how to take blood pressures at the request of the Medical Advisory Board.⁴⁷ The board approved a policy that under special circumstances, "Nurses may take blood pressure readings on skull or accident cases at regular

intervals after midnight except in cases where the attending doctor specifies otherwise in writing. It is to be pointed out that this ruling is for skull and accident cases only."⁴⁸

Policies and minutes indicated that initially, only specially trained nurses could take blood pressures. But once students received the requisite teaching and supervision as part of their basic curriculum, all nurses were taught and authorized to take them.⁴⁹ After acceptance as a common nursing competency, the issue then became how frequently nurses were willing to take blood pressures on the wards, given the time constraints of caring for large groups of patients. For example, in 1966 a memo went to supervisors and head nurses that ward staff would not be able to take blood pressures more often than every two hours on any patient. Patients who needed it done more frequently would be transferred to the intensive care unit.⁵⁰

Likewise, intramuscular injections were delegated to nurses during this same period. In 1947, Miss Edith Young (Director of the School of Nursing and Nursing Service) pointed out that "graduate nurses sometimes had to give intramuscular injections when working in outlying districts," and therefore, "some training should be given student nurses in this technique."⁵¹ The matter was referred to the CPSO but no action taken on the recommendation. Three years later, hospital committee minutes indicated that nursing instructors should instruct graduate nurses in the 'art' of intramuscular injections. Yet, reports to the board in 1953 indicated that "Injection treatments [had] multiplied so that all junior interns were spending two full mornings a week on nothing else." Only when a letter from the Intern Committee in 1953, raised the question again (as an intern workload issue), did the Medical Advisory Board finally act and adopt the recommendation that nurses could give them.⁵²

Following the recommendation, nurses were given training and supervision in intramuscular injections (IMs), following the delegation process set out by the CPSO. One nurse described how "there was this one physician who taught the nurses to do IM's because it was not in the basic program and they had to go down to I think it was outpatients department and be taught and be tested and strut their stuff in front of Dr. Fisher. . . . But when I came in [training], the nurses were

teaching IM's; we were taught blood pressures; . . . [a] number of sanctioned medical acts were delegated to nurses and either taught by the physician to the nurse (or in our case, taught to our clinical educators) and they [the instructors] undertook the teaching."⁵³

Apparently the additional responsibility created problems for nurses' work load as well. When the Director of Nursing inquired in 1954, if the interns would again 'take over this work,' the Board refused to take the responsibility back.⁵⁴ Once nursing, always nursing seemed to be the rule. Interestingly, the impetus for delegation appeared to be the intern workload issue and not the nurses' perceived need for the skill in particular practice settings (which they had expressed seven years earlier).

The process of delegation and adding skills served the hospital fairly well in that, it was well-defined, adaptable to different technologies, and could be easily documented. Each nurse was named along with the procedure(s) taught, date(s) taught and examined, and the name of the person(s) who taught and examined. Cards were kept on file and annual re-certification noted where necessary, thus providing a legal record as well. The process came to be known popularly as 'carding' or 'being carded.' Once the mechanism was in place and understood by the participants, medical technologies began to move rapidly from restriction to specially-trained personnel to integration into the school curriculum. Once the school taught a skill as part of the basic training program, it became accepted as standard nursing practice.

Construction of Knowledge by Nurses

During the previous, introductory period in which knowledge was typically 'constructed for' nurses, their roles related to technology at the most elementary levels--preparing, assisting, and cleaning. From this beginning, nurses moved along the technological continuum during the period of delegation, to focus at the second level (the procedures associated with blood). Here, they began to construct their own practice knowledge but were still limited by the constraints of students as the main care providers.

Each delegated skill required additional knowledge which nurses borrowed from the basic sciences and transformed through their everyday experiences. Nurses used a variety of sources to construct the knowledge they needed for successful management of transfusions--including formal and informal ways of knowing and doing, and 'tricks of the trade' shared among themselves. Their ability to successfully manage technology and incorporate it into patient care was not only challenging, but became a source of pride and/or loss of pride. Nurses also developed strategies for self-protection as they worked with these increasing responsibilities and expanded roles. One nurse expressed the challenge as, "The blood is ready, is the patient ready?"⁵⁵

Sources of knowledge--formal and informal learning

Pressures from outside the profession (such as the 1949 judicial inquiry) and pressures from inside the profession (such as the provincial and national studies on nursing) shaped changes in nursing education in the fifties and sixties.⁵⁶ Although a complete separation of education and service was not achieved until 1973, the OCHSN introduced substantial innovations earlier in the form of two re-structured programs: the "Two plus one" program in 1957⁵⁷ and the "Interne" program in 1967. Both of these programs resulted from efforts to reduce the amount of time required to achieve the knowledge and competency needed for practice. Both programs were part of the strategy to increase the number of graduate nurses available to hospitals during the on-going shortage of nurses. The premise was that it would take less time and resources to educate nurses, if the program could be educationally-focused instead of service-focused. Although there were conceptual differences between the programs, both concentrated the theoretical course work in the first two years, and the clinical experience in the third year. The Interne program was designed to build leadership and administrative abilities as part of the final year.⁵⁸ One adverse effect on hospitals from the large number of nurse interns who needed to be accommodated with placements, was a reduction in graduate staff nurses--once again, replacing experienced nurses with novice nurses.⁵⁹

In the classroom, physician lecturers and nursing science instructors continued to share formal teaching roles until the instructors decided in the mid-sixties, that "they could do it themselves and more satisfactorily."⁶⁰ Most instructors had completed either a degree or certificate in teaching and considered themselves qualified in the content and better prepared than physicians in educational theory and strategies. "[Nurses] were not ill prepared people. It was just that...only the physician was deemed to know [it] all." The difficulty seemed to be that "doctors either talked over the students or they talked as if they didn't have a brain in their heads. So it was gradually just that we stopped inviting them to present."⁶¹ Part of the instructors' growing confidence came from educational preparation and clinical experience, but early influences of the women's movement were also felt by this generation of nurses. There was a rising awareness of the constraints of conventional, gender based roles in medicine and nursing through the sixties. The resistance expressed by these nursing instructors was subtle and gradual. By gaining control over course content, instructors could begin to shape nursing knowledge development, although of necessity, it was still contingent on the state of medical knowledge.⁶²

As in the earlier period, course content was divided into nursing science and nursing arts classes. In nursing arts classes, students reviewed the theory from science classes and added the technological components such as:

The uses of blood, why it was used, the precautions to be taken and then the actual technical skill of how to assist the nurse technician. To set up the blood and to monitor [it]. Basically our role was very close scrutiny and monitoring of the actual infusion and, of course, it was drilled into us that you checked and re-checked, that you had the right blood, that you were not administering incompatible blood. And I think that was sacrosanct-- I don't think there was a nurse who graduated, who didn't have that well imbedded in their memory that you checked the cards and you just did everything to check that you had absolutely the right person with the right blood.⁶³

One nurse recalled being taught "chiefly tasks" in the classroom, and "in the nursing lab (a classroom setting where we were sitting around and [skills] were demonstrated) . . . we got on a bed, and each one of us took our turns at trying whatever we had been taught--Like blood pressures, taking pulses and trying to find different kinds of things."⁶⁴ Other students went to the blood bank and obtained out-dated blood to practice the 'hands on' skills of setting up a transfusion.⁶⁵

First year student nurses at the OCH during the late 1950s, experienced what it was like to be a patient and undergo certain procedures first hand, by participating in a "Hospital Weekend."

We had a weekend where certain of our classmates were patients and certain of the classmates were the nurses. The seniors acted as the supervisors and we were admitted to the lab on Friday night It was all make believe-- but each person had a diagnosis and had their chart and you had to have your temperature and blood pressure done . And we didn't actually formally do IV's on them as per se . . . , but often you would be asked questions about it. You had to do your evening charting and get them prepared for bed of course, with back rubs and all those good things . . . and they had to sleep in the hospital (in the make believe hospital) overnight and I think they were excused by noon on Saturday. But that was a real learning experience too . . . both for those who had to play the patient and be in bed and perhaps move one arm and be fed, etc. and for those who got to be the actual nurses.⁶⁶

Skills assumed great importance and became highly valued by students as a sign of competence. If you had mastered everything on the list, you could go out into the practice world with confidence and pride. "Each student nurse had a blue book and you had to have had all your skills signed off or you didn't graduate."⁶⁷ According to the 1953 skills list, blood transfusion was a required medical experience for all students. One photograph featured a patient, a physician, an instructor, and a student with a transfusion in the Out-Patient Department (Illustration 4).⁶⁸

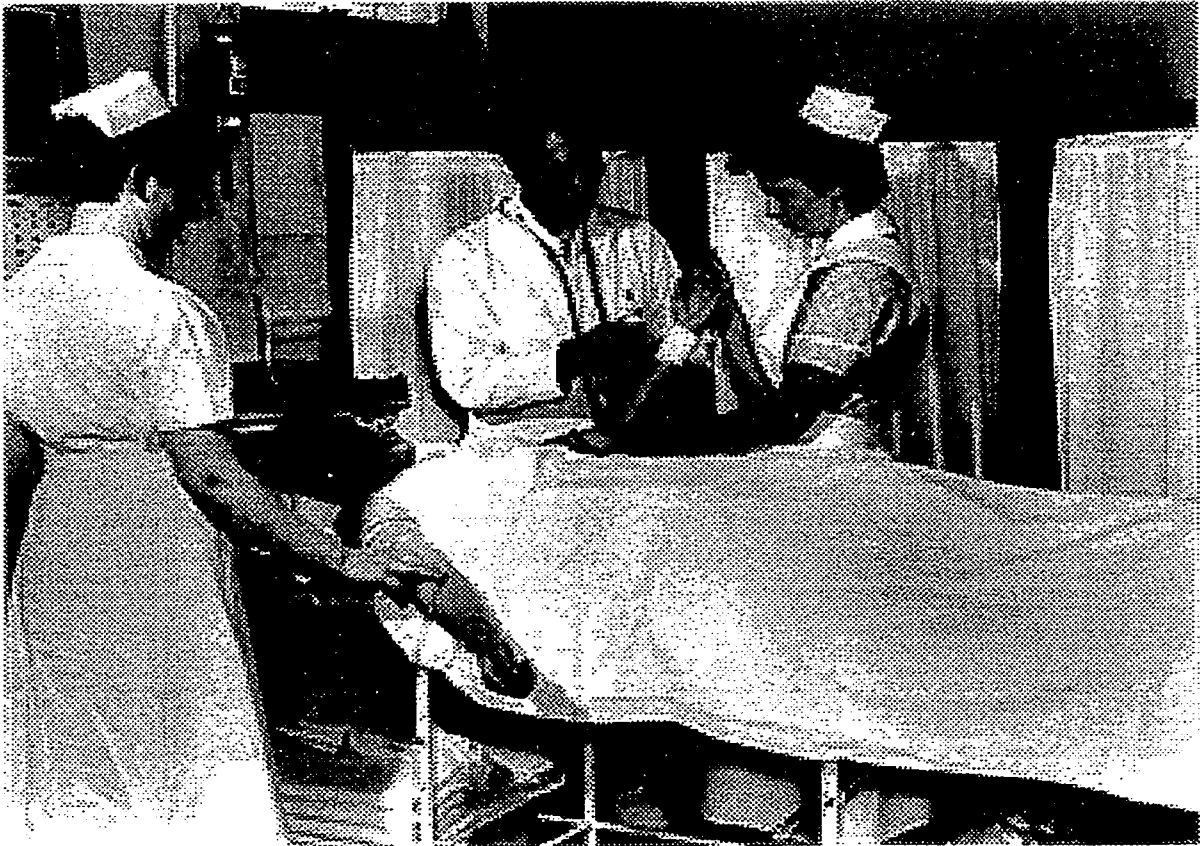


Illustration 4: Transfusion in the Out-Patient Department. From the "History of the OCH School of Nursing" scrapbook created by Jean Milligan, at the OCHA. Used with permission.

Skills took on added significance during the 1960s, a time of rapidly developing specialty units. They served as one means of differentiating nurses and provided entry to new practice environments. "Nurses always liked skills and psychomotor tasks. It felt like they were getting into the physician domain, it made it a little bit more challenging for them and a little more interesting and they always wanted to pick up the technology. I can't really think of a time when nurses have said 'no, I don't want to do that.' It's always been that they have been very eager to take on . . . psychomotor skills [techniques]."⁸⁹

Informal sources of knowledge included information picked up on medical rounds from physicians, 'tricks of the trade' shared by more experienced nurses, expanded procedure books, and

role modelling by the Blood Team nurses. Graduates of the 1940s-1950s commented that "we had to get most of our knowledge from the doctor,"⁷⁰ and that "we did a lot of eavesdropping and if Doctor A was talking to Patient B, we would be listening and maybe taking some of it in--and hoping it might be useful."⁷¹ Within this student world, more experienced role models were found in the supervisors and private duty nurses hired either by individual patients or the hospital to 'special' cases considered too complex for the student work force. Supervisors were also important resources for novice practitioners. They were typically career nurses with long service records of accumulated experience and were recognized as part of the teaching staff. Night supervisors at the OCH were described as "wonderful women" with an enviable "body of knowledge and way of handling student nurses."⁷²

On the other hand, the private duty nurses served as informal role models: "It wasn't their responsibility to teach us but they taught, I was going to say 'tricks of the trade'. . . these specialists as we used to call them. They had a lot of good experience in patient care and they would do almost everything for the patient."⁷³ The Blood Team also provided an important though unofficial resource for learning about transfusions as they went about daily activities, although the team did not participate in any formal lectures to the students. Both nurses and students relied on the team to solve problems with the procedure: "If it didn't keep going, then we had to call the nurse technician to come because we couldn't do anything with it."⁷⁴

Originally, the Blood Team was a strategy partially intended to relieve nurses' workload, but by the mid-sixties nurses were feeling constrained by the limitations imposed by the delegation process. "Getting the blood in at the time it was specified or if you had a temperamental or 'poor veins'--that could be a bit of an annoyance and a frustration and a challenge, because you really couldn't do too much on your own. You could fiddle a little bit but you couldn't fiddle too much. It was call the blood team to come and either restart it or have them aspirate."⁷⁵ Nurses were limited to non-invasive techniques to maintain the site. "We could adjust the physical [things] but not the IV site on the patient. Anything to do with the patient infusion at his site. We didn't flush it or do anything like that. We didn't touch it. It was almost something you feared because that was their

[the nurse technicians'] responsibility."⁷⁶ These nurses had developed experiential knowledge about transfusions but legal restriction prevented them from using it.

When transfusion was still a relatively new medical therapy and delegated to only two nurses, there was fear of the procedure and blood's unpredictability. Nurses were preoccupied with the venipuncture site and focused on how to maintain it for the duration necessary.

The big thing was the necessity to observe, observe and observe . . . to make sure that you were watching and there were so many things that you didn't know in the beginning . . . not only to observe the transfusion but to observe the patient as a whole. I think in the beginning we were so afraid of the transfusion that [it] got all of the observation but as time went on, we realized we had to take care of patient in a holistic way . . . You were so absorbed in that needle in the beginning, that you didn't take the whole thing in.⁷⁷

Not only did blood have the potential for dangerous reactions, it could also produced dramatic positive results. Patients "that you would have given up on because they weren't going to make it and suddenly they were transfused and gained strength again--to see this person improve the way they did, was really miraculous."⁷⁸ Results were often rapid and visible: "It was immediate too, you know--you did a repeat CBC and their hemoglobin and hematocrit was back up and so you felt good about it."⁷⁹

For nurses, the dangers of transfusion primarily concerned the complicated procedures of collection and administration. They accepted blood as beneficial, not harmful; it was life saving: "We didn't worry about anything bad coming from the blood transfusion. It was always looked at as a good and positive outcome and never that it would do anything harmful or that it would have any long term effects."⁸⁰ As students, the possibility of blood transmitting infections "was never discussed that I can recall. You just had ultimate faith in the blood supply."⁸¹ But as the frequency of transfusion increased and nurses had more exposure to the technology, their understandings began to shift as

did those of the patients. One nurse described feeling ambivalent in that she "saw it as very necessary for survival during extensive surgery... with a good feeling that blood saved, but it could also be dangerous because of the reactions that people could suffer and so you treated it with respect."⁸² Blood became a double-edged sword—life saving and life threatening.

Patients sometimes brought very different perspectives. One student remembered a woman who became "very upset that they might transfuse her with blood from a male donor and she had to have female blood. She wanted a signed statement by the physician that he would not put any man's blood into her. She wanted lady's blood thank you very much."⁸³ Nurses recalled that it was their responsibility to see that the patient got the blood when it was ordered. When patients did not want to have blood, "I just remember trying to persuade them. There was this fellow who was down in the very end room down on the right. He did not want his blood transfusion and somehow I must have said the right thing because he decided he would take it."⁸⁴

There were also Jehovah's Witnesses, who refused to receive blood based on a scriptural interpretation in which transfusion was equated with ingestion or 'eating blood.' To persons of this religion, the ingestion of blood is forbidden because of belief that "the life is in the blood" and not because of any association of blood with disease.⁸⁵ The hospital developed another procedure to deal with the refusal of blood transfusions. According to one of the nurses,

There was a separate statement that was secured from nursing office that the patient had to write--a release saying that they did not under any circumstances want [blood] and they recognized that they might not survive the surgery. All of the consequences as deemed by the medical community were fully listed to that patient and he had to sign that off. It had to be witnessed and that was very much the part of their chart.⁸⁶

But not all patient resistance was managed in this same way. In another incident, the nurse recalled: "I had a patient when I was a nursing teacher--to whom the doctor simply said, 'This [blood

transfusion] is what you need and if you won't allow me to do this, then I can't take responsibility for your surgery."⁸⁷ The patient went home without the surgery.

'Tricks of the trade'

Along with the formal classroom lectures, the laboratory demonstrations, the supervised skills training, and role modelling by experienced nurses, nurses valued the accumulated wisdom gleaned from 'tricks of the trade.' These were practical solutions to problems which nurses encountered in assisting, maintaining and monitoring transfusions. While some of the tricks had scientific underpinnings, others derived from nurses' own lived experiences with blood as it complicated care giving. Tricks could only come with experience in dealing with the technology. As late as the 1970s, nurses reinforced their preference for experience as the "best teacher."⁸⁸ Some of the blood tricks included: elevating the pole a little higher; "squeezing the rubber port (which we weren't supposed to do--[because] it might dislodge a clot);" and "calling the technician to come and needle it."⁸⁹ One nurse described some of the tricks she learned as:

The things I would learn as I was longer in practice--about how to gently rotate the blood. . . . don't shake it you will break the cells, that kind of thing. And the higher it is, the better it runs. . . . tricks of the trade We learned to use saline [with] whole blood. You cleared your tubing with saline before and after; but it was never mixed with the blood. Then with the advent of packed cells, the doctor would say, 'Give it with so many cc's of saline.' And it was really a neat trick to run it down, and up and into the bag . . . it made the blood less viscous and it ran better.⁹⁰

Besides the formal knowledge and the accumulation of 'tricks of the trade,' nurses also learned 'principles' related to other techniques. Principles provided underlying concepts but lacked specific step-like procedures for managing the technology. When the CNO asked agencies to

classify nursing knowledge, it differentiated between skills requiring 'competence' and skills requiring only theoretical teaching. A similar idea was expressed in the nurse's comment that, "Officially, we didn't know how to give intramusculars . . . officially, but you picked up an awful lot along the way.... We were taught the principles but officially we didn't give them."⁹¹ Knowing the principles and 'picking up along the way' contributed to further blurring of the technological line separating medicine and nursing.

'Civic' Pride

Pride in one's work, in the hospital's reputation, and in the training school was a motivational force for students and nurses which had both organizational and individual components. For students, pride was based on performance competence and the development of expertise which included the mastery of hundreds of elaborate procedures. "The Civic Hospital always had pride in doing their nursing care and providing patient care in that excellent way and we didn't want to tarnish that reputation," reported one graduate.⁹²

Mastery not only instilled professional confidence but set the boundaries of safety for novice practitioners such as the student work force. With more experience, nurses learned to adapt some of the procedures, to find 'short cuts.' As an entry from one student yearbook advised: "You have learned in the classroom many complicated, time-consuming procedures; they are as useful as time is plentiful. Therefore, at all times use your own judgement."⁹³ But when it came to blood transfusions, nurses maintained a strictness related to their fear of potential reactions. "You followed the procedure, you didn't do anything to cause any harm to the patient. You knew when to take the temperature, you knew what the reactions were and in fact, the type of reactions (I recall) being printed on the back of the card. There was no excuse for not knowing what they were."⁹⁴

Pride carried consequences when expectations were not met. Nurses were accountable to teachers, to physicians, to their peers, to the patients and families, and to the public. They filled out incident reports when expectations were not met; there were colleagues to face when work was left

undone; physicians and families demanded explanations when care did not happen the way it was expected to happen. Pride was called into question during the judicial inquiry of 1949 which alleged poor service and patient care (both medical and nursing). Nurses gave evidence at the inquiry, explaining any variations to the expected standards of care. The Board of Trustees stated explicitly that the public's trust and the hospital's reputation were at stake when care was questioned.

Although nurses related in similar ways to the Blood Team as to physicians during the earlier period (by preparing, assisting and cleaning up), they also took on more of the maintaining and monitoring roles as the Team enlarged their own scope of activity. Part of their concerns were in maintaining the flow rate and getting the blood in 'on time.' Although they were limited in ways to intervene and other patient care activities impinged on the capability of being timely, nurses were held accountable nonetheless. If a unit of blood was not transfused within the set period of time (usually four hours for an adult), nurses had to fill out 'incident reports' complete with circumstances and actions taken. It was considered a medication error: "it was a med error . . . an error you know, if you didn't get it [in] . . . you did everything that you could. If you didn't get it in on time you needed to fill out an incident report."⁹⁵ Besides having to file an incident report, the next most-dreaded consequence would be phoning the physician (or slightly less intimidating, the intern) and informing him (usually a male) that the transfusion was not running, or the vein had been 'lost,' or the blood was wasted. Incident reports also affected the evaluation or 'efficiency reports' kept by the head nurse.⁹⁶

Sometimes, the ramifications of carrying responsibility for blood became overwhelming. Hanging blood on the wrong patient brought such consequences, that in one incident, the error was not discovered for three days until the Chief of Transfusion Medicine overheard a coffee shop conversation about the incident. He found the disposed, empty blood unit in the garbage of the utility room.⁹⁷ As he told the story, the situation involved a 'junior' nurse and a patient who moved to a new room. The junior nurse hung the blood on a patient in the original room and bed, to the surprise of the patient who commented that her doctor hadn't told her about the plan for blood. When the nurse

discovered her error, she simply gave the rest of it to the correct patient without reporting the incident. Since no reaction occurred, the incident was covered up—not only by the nurse, but by the intern who did not want the bother of filing the reports.

Accountability was not only vertical but horizontal. Nurses' pride extended to peer expectations, manifesting itself in a 'get it done' mentality and the practice of 'covering one another's patients' during work breaks. It was understood that you didn't leave work for the next shift—either cleaning, treatments, or patient care. Pride meant completing your shift with all the tasks finished.⁹⁸ It also meant meeting an obligation to your colleague. "You didn't go for a break and not tell somebody to watch your blood! And woe betide those persons if the blood was a way ahead or a way behind or even stopped . . . because you know it had to be done the way it should be done."⁹⁹

In the administration of intramuscular injections, one nurse recalled her loss of pride when her technique was called into question:

I was really put out when they questioned my technique, because I had given most of the injections They were out to get me, because they said, 'Oh it was an abscess.' And what it turned out to be, was the fact that the person had an allergy to the medication that they were being given I was a grad at the time, but I was really put out that they were questioning my ability. And I said . . . 'If you want me to go down and have anybody check me, fine.' The head nurse said 'No, no it's alright.'¹⁰⁰

Technology Complicated Things: 'The Blood is Ready, is the Patient Ready?'

With increased exposure to transfusion technology, nurses found challenges primarily in coordinating patient care activities around the procedure and in navigating relationships imposed by the delegation process. They developed sometimes subtle strategies for self-protection in situations where the accountability lines intersected. Although nurses in the 1940s had accepted transfusion technology as something nurses were "told to do . . . and you did it,"¹⁰¹ by the 1950-1960s, nurses

assumed roles because "there was no one else to do it."¹⁰² 'Taking on' technologies complicated care giving and working conditions.

Complicating patient care

Limitations imposed by the delegation process were partially responsible for increasing the work load and complicating patient care. When there was a transfusion ordered, it became the focus of attention--patient care was organized around the procedure: "We had to have everything done before it was started So it was usually [done] in the afternoon."¹⁰³ The nurse's role included transporting the blood from the Blood Bank, verification of the medical order and that the required lab work had been done; verification of the patient's identification and the blood itself done conjointly by two nurses, to reduce the risk of error. Sending nurses to pick up the blood became more problematic in later years and in settings such as the Emergency Department where large quantities were used in trauma cases:

A nurse had to take the requisition and walk down to blood bank which has always been under the emergency department and wait for the tech to go and get it out of the fridge and sign it off and bring it upstairs . . . so then, I lost a nurse in the department at a time that was probably crucial I seem to remember that it had to be the RN that went down to get the blood. We couldn't just send the orderly down. So we lost a really vital person for 5 or 10 minutes.¹⁰⁴

As well, "you had to follow these steps and you had to make sure that [the blood] was up, when it went up . . . you had to chart the number of the requisition and the number of the blood [unit], all of that information."¹⁰⁵

Reliance on the expertise of the Blood Team was difficult to shift as the responsibility became shared with the bedside nurse. Working from a limited knowledge base, nurses used basic

assessment skills (such as vital signs measurement) and relied on signs of reaction to blood (temperature elevation, change in vital signs, diaphoresis, chilling, shaking, rashes¹⁰⁶) as indicators of developing problems. Observation and vigilance were key words to describe early participation in this technology. Nurses recalled: "It took a lot of time because you were constantly observing"¹⁰⁷ and "You were in frequently, . . . blood is something that you do have to watch carefully, because it can go very quickly (the way you turn your hand) . . . , it can go very slowly and stop . . . , so you really had to stop and spend time with them."¹⁰⁸

The post-war expansion of the hospital insurance system which extended coverage for private and semi-private accommodation to more patients, resulted in another complication for care giving. Hospitals responded to requests for these types of facilities with architectural changes which converted large, open, twenty bed wards to single rooms and smaller semi-private rooms for four persons. With the change, nurses lost the capability to quickly and easily visualize any and all transfusions throughout the assigned ward. Visual observation was a key component to monitoring and timing the flow rates, knowing when to add the next unit, coordinating the warming process, and picking up on early reaction signs. As one nurse described it, "In the olden days, when you had a large room with maybe twenty patients in it, . . . you could go into a room and at a glance you could see it. But as you went to semi private and then private, you really had lots of walking to do to make sure that blood was alright."¹⁰⁹

From observation and monitoring of the patient, nurses progressed to problem solving difficulties with blood. "It had to be watched because it was very unpredictable"¹¹⁰ and in spite of blood's unpredictability, nurses were accountable that the procedure was completed accurately and on time and if the transfusion was not completed within the designated time, it was wasted (discarded). "The doctor gave you strict instructions as to how [many] drops there were to be and if you didn't have a good hand, you were in trouble."¹¹¹ Some problems affecting timing and flow rates were related to equipment limitations. The needle could be easily dislodged and become interstitial; it could be accidentally removed in the process of ambulation, patient care, or

restlessness; if the flow slowed down temporarily for a variety of reasons, the needle could become clogged and unusable. Since the flow was controlled by gravity, even position changes made by the patient would alter the rate.



Illustration 5. Blood was very unpredictable.

Photograph by Malak, as used in Norman Miles Guiou, *Transfusion: A Canadian Surgeon's Story in War and in Peace*, (Yarmouth, Nova Scotia: Stoneycroft Publishers, 1985): 103. Used with permission.

Physiological changes within the patient (such as vasoconstriction or vasodilation) had the potential to alter the flow as well. Only small needles could be placed in patients with small veins, which interfered with flow and rate; defective tubing or air vents could also challenge the nurse. Restlessness posed another challenge to be managed not only due to the length of the procedure for the patient but also because restlessness was a frequent indicator of physiological instability. "Positioning was the big thing, and it seemed that if you could get the patient to be still and had them

in a good position to begin with . . . but if there was a restless patient, that was when the alarms went up and you had to be very vigilant . . . [you used] all sorts of methods to keep that arm still and it wasn't always easy."¹¹² Some of the methods included restricting the patient to bedrest during the procedure and using splint devices to immobilize the arm: "Because they didn't have the sophisticated needles that we have today . . . yes, the patient was kept in bed during a blood transfusion no doubt about that. But unless the patient was at risk of pulling out the IV and the blood transfusion, you wouldn't tie the person down. Their arm was on an arm board which was wrapped in gauze. To immobilize them."¹¹³

Although blood was refrigerated to prevent growth of bacterial contaminants and prolong its storage capability, it was warmed prior to transfusion. In the 1940s, warming became the nurse's responsibility as well, complicating the procedure and the nurse's work assignment. In the earliest procedures, blood was collected into glass beakers which were set into warm water baths as a type of 'holding tank' until the recipient was ready to receive the transfusion (a matter of minutes). Some textbooks of the era illustrated ways to use hot water bottles wrapped around the bottle of blood and/or systems where the blood tubing was positioned to run between a series of hot water bottles. Nurses of the OCH recalled: "We used to set them in a basin of warm water . . . You knew it couldn't get too hot . . . So you just put them into warm water and let them sit there for a little while. You were trying to get them to room temperature"¹¹⁴ and later, "Warming was always an issue then and so what we did was---we just took a basin, a wash basin and put warm water in it and just put the tubing in there and so that was initially how we did it."¹¹⁵ Warming the blood was not a precise art during this period.

The sixties brought equipment changes such as plastic blood collection/transfusion bags and disposables. Techniques changed to permit the blood tubing to run 'piggy back' into an intravenous line nearest the entry site so that blood could be discontinued in cases of reactions without losing the IV site. Gradually, saline was discontinued as an additive although nurses' practice was difficult to change. One nurse recalled that,

Nurses were instrumental in working with transfusion medicine and stopping this whole business of having to flush the tubing with saline. You could start right in with the blood... it was as nurses began to question, 'why do we have to do this?' and speaking with Dr. Gwyn Jones. Well, 'you don't have to do it, so don't do it.' Now it was a difficult practice to stop. Because people were so wedded to [the practice] that you had to do it . . . 'the blood might stick to the wall of the tube and it might cause damage to the blood cell.'¹¹⁶

Nurses also assumed more responsibility in patient and family teaching through these years. As their own expertise developed, they were better able to deal with family questions and anxieties, especially since transfusion was viewed as a serious procedure. "[In relation] to the patient and the family, we have some explaining to do, as to the fact that they have had surgery and there was blood loss and this is a replacement and it was really a topping up. If the person was extremely ill, then it was more difficult because you wondered how long this topping up would last"¹¹⁷.

Complicating relationships

Watchful vigilance over transfusions served patient safety needs and provided the context for building the technological art and science of blood. But when problems were identified, the bedside nurse had to navigate complicated relationships to solve them. Nurses were admonished to call someone else who would then come and resolve the problem. "We couldn't touch the IV. That was all done by the IV therapists."¹¹⁸ The limitations were related partially to the novice capabilities of student staffing and partially to the delegation model which structured expertise and legal authority in the hands of a few persons.

Meanwhile nurses still carried that responsibility to keep the vein open, to control patient behaviors, and to see that the blood did not go over the time limit. Calling someone else meant a subsequent waiting period—waiting which was influenced by hospital wide dynamics at any given

time. When problems developed, "You stopped the blood, you called the nurse technician, you called the physician. Anybody you could think of, you called."¹¹⁹ Frequently the Blood Team served as an intermediary to the physician: "They would call the Blood Team [who] would make a decision to talk to the doctor and he would then give them orders of what to do."¹²⁰ Supervisors and head nurses also had access to the physician which the bedside nurse did not have. Policy statements were developed as to who could contact the physician and when they could be called.

We had our head nurse and the assistant head on the floor who . . . helped make the decisions. If we had a problem, often times we would go to them and they would more or less decide what the answer should be and whether the doctor should be called . . . We as young nurses, didn't communicate with the staff physicians the same as what we do now. And most of the communication was done through the head nurse. It was like a tier system.¹²¹

Within nurses' work hierarchy, the Blood Team held special privileges based on legal delegation, knowledge and expertise. Their position and performance earned respect from both nursing and medicine. In relations with physicians, the chairman of the medical board came to their defense on at least one occasion: "[Dr. Fisher] knows of cases where the Blood Team have telephoned the responsible doctor and been subjected to a dressing down, instead of a courteous discussion . . ."¹²² Students recognized their authority, commenting that "they did rule the roost . . . as a little student, you didn't want to get in wrong with the Blood Team. They expected students to mind their 'P's and Q's' and do the right thing. And I think because they had that expectation, we tried to do the right thing. We were not going to goof off that's for sure."¹²³

A 1952 policy reiterated that blood could be added only by graduate nurses or a technician. Students could add blood only under direct supervision by the head nurse or a member of the Teaching Department.¹²⁴ Although officially students were not allowed to 'hang blood,' they could

do everything else associated with it. "The head nurse . . . would often say, 'you go in and see how it is doing. If there is any problem, call me.'"¹²⁵

Little by little, in piecemeal fashion, aspects of managing blood transferred to nurses. The physician determined the flow rate initially. The earliest procedures at the OCH did not indicate volume, rate, or time as part of the technique; the 1952 revised procedure noted that "the doctor is responsible for regulating the rate of flow—usually 30-50 drops per minute. The nurse should see this is maintained."¹²⁶ One nurse from the 1960s recalled that "There was a standard rate, but technically the physician was supposed to order the [rate]; that this was to be infused over X number of hours. They didn't always do it, so they left it to our judgement."¹²⁷ By 1979, the procedure suggested "approximately three hours for one unit of whole blood, two hours for one unit packed cells,"¹²⁸ leaving the nurse to work out the specific details as appropriate for the patient and the situation.

Self-protective strategies

Nurses coped with new technology and role changes during the period of delegation by the development of strategies for self-protection. Interviews revealed strategies such as: vigilance, strict conformity to detailed procedures, 'over teaching' to students, examination and certification of skills, covering for each other while absent from the unit (nurse to nurse accountability), resistance to technology, and seeking supplemental knowledge from a variety of sources. Over time, the strategies changed as nurses became increasingly comfortable with transfusions.

Probably the greatest fear for nurses was a transfusion reaction—preventing it, recognizing it, and managing it when one did occur. One nursing student recalled that instructors told the class a hospital anecdote to illustrate the consequences of error:

There was an incident where the incorrect blood was hung on a patient and the outcome was revealed to us . . . I don't know if there was more than one, but I can only recall being told about one incident. And people felt very badly about that. We did not want to see that

occur again and so, I think there was more vigilance on the part of the teachers who were in the school at the time, to convey the urgency and the need to be very vigilant about administering blood.¹²⁹

To avoid error, teachers emphasized the importance of compliance to procedures which had been developed in detail. "We followed [the procedure] one, two, three, four . . . for the protection of my license and the protection of the patient. When the student was doing it, . . . I was responsible [as the teacher] and I think if you teach to 100% [accuracy], then if you drop a few points down the way she is still safe I just couldn't afford not to, because of my role as the educator."¹³⁰ As practitioners, nurses expressed more concern about transfusions than other techniques wherein they learned quick 'short cuts' to the officially approved procedures. With blood, they tended "to go by the straight and narrow . . . the written policy or procedure As a practitioner, it wasn't something that I was fearful of. I was very cautious in doing it. I made very sure that you had the right patient, the right blood and not administering something that was incompatible If the patient needed a blood transfusion, they got a blood transfusion."¹³¹

Resistance provided a subtle strategy for protecting the nurse and creating changes in roles. Transfusions were labour intensive and time-consuming because of the equipment, the process, the observation/assessments required, and the increased number of private/semi-private rooms. Usually patients were quite ill and transfusion was only one aspect of their care. Nurses set limits on the number of patients with transfusions they would manage: "If you had more than two of these with blood then [nurses] would certainly say, 'I cannot watch all of these patients, this is too much.'"¹³² During the fifties, the capability for infusing blood with mechanical pressure created controversy regarding who would take responsibility for this aspect. "I remember blood under pressure in the [operating room] . . . that only nurses . . . could pump the blood . . . At one time it was only doctors and then only special nurses But there was a lot of kerfluf at one time about who, in fact, would do what--give the blood under pressure and whose responsibility it was."¹³³

As technology for warming blood evolved, nurses in the Emergency Department staged their own resistance to use of the warming machine:

We had a machine that was purchased for here (a Fenmore blood warmer) which everybody hated Even though we received in-service on it and knew how to use it, it was something that we didn't use frequently. None of us liked change and none of us liked being uncomfortable, particularly because it was a critical patient and we needed to get this on there . . . and I don't think that we really respected the problems we could run into with hypothermia. And so we had this machine that we had purchased and spent money on, and it was not used for anything. So consequently, it gathered dust in a corner. Which is a real shame.¹³⁴

With the parallel technology of blood pressure measurement, nurses resisted (and thereby also shaped) the technology by the limits they set on the frequency of readings. After nurses assumed responsibility for blood pressures during the fifties, the practice became an expected competence of all graduate nurses. With time, physicians came to order blood pressures more frequently, on more patients—even to the extent of returning post-operative patients to the wards before their vital signs had stabilized. Nurses resisted by going through administrative channels to eventually obtain a written policy that blood pressures could not be ordered on patients more frequently than every two hours when on general nursing units. In doing so, they structured limitations based on number of patients and the time available on busy wards.

We had lots of arguments in the early 60's, 70's and 80's about the frequency with which the doctor could order the blood pressure because if it was more often than every one [or] two hours, then the person had to be in ICU or have a nurse on with them-- and there was great discussion about that. Now there is a difference in [a patient] who has suddenly gone flat

when you are doing their assessment and [a patient] who has been sent back to floor when they just didn't have the nursing staff to do it [in recovery]. So every one [or] two hours was acceptable, or if we [the nurse] worried about someone, and we chose to take it more frequently, . . . then we did it.¹³⁵

These nurses did not object to blood pressures when they perceived a need for the information to guide patient care. They were expressing confidence in their own ability to know and to decide when and how often the procedure was needed—moving beyond a routine compliance with medical orders.

Nurses' Work Patterns

Although the Board of Trustees created the Blood Team as a partial remedy to deal with both nursing and intern shortages as well as a solution for managing a new technology, they soon found that the small core of nurses could not keep up with demands for expanded roles. The system worked so well that other technologies were included in the team's mandate and more nurses had to be hired for this special team. Eventually, graduate ward nurses assumed more and more of the functions previously reserved for the Blood Team/Nurse Technician Team. The name change in itself was revealing, in that many of these roles in the 1960s were perceived as technical tasks.

Economic and feasible

As long as hospitals were predominantly staffed by students, the majority of nursing care continued to be delivered by novice practitioners. There was complete turnover in student populations every three years, with only a small core of administrators and educators to build continuity and expertise—and this leadership body was not practicing at the bedside where technological knowledge was being constructed. Beginning with the Weir report, nursing studies demonstrated the limitations arising from reliance on students for nursing service as well as the relative economic value of students versus graduate nurses (refer to previous discussion in chapter

one). The 1949 Judicial Inquiry into the state of care at the OCH provided further impetus for change in the proportion of graduate nurses to students, which continued until the school of nursing closed and left patient care primarily in the hands of graduate nurses. Until the hospital had a core staff who remained employed over longer periods of time, it was considered neither economic nor feasible to train nurses for delegated or expanded roles. The Board argued that training was expensive, that the learner needed to use the technique frequently enough to maintain proficiency, and staffing had to be stable enough to make it cost-effective.¹³⁶

The ability to attract students into training and to retain nurses in practice, became critical to the establishment of a stable work force during the 1950s and 1960s, when women had more career choices. One strategy used for recruitment included plays for high school students, in which the OCH student nurses portrayed various aspects of training.¹³⁷ McPherson suggested that the leadership reconstructed nursing's image as another way to deal with recruitment. Using gender as a concept, she examined the portrayal of femininity across five generations of Canadian nursing. According to her analysis, the profession did not appear different from other women's roles in 1900, but stood in contrast to the "liberated, sexual mores being advocated for the new woman" during the 1920s and 1930s.¹³⁸ By the 1940s to 1960s, nursing leaders were forced to abandon Victorian ideals of femininity and reform their public image as "nurses [expected to enjoy] the same opportunities for social and leisure pursuits as did 'all modern women' . . ."¹³⁹ Nursing was no longer portrayed as an occupation only until marriage, but for after marriage as well. McPherson summarized the shift this way:

Nursing leaders and educators advocated particular sets of appropriate sexual and social behaviour according to the political economy of their occupation. Second- and third-generation nursing leaders used their positions in hospital training schools to instil an exaggerated version of Victorian femininity. This asexual workplace persona was necessary to enhance nursing's reputation of respectability and at the same time to convince young

women to dispense personal and physical care to the bodies of strangers. When, in the 1940s and 1950s, the occupation's leaders needed to increase dramatically the size of the nursing workforce, they reconstructed nursing's image to emphasize the fundamentally heterosexual nature of nursing, that nursing and marriage were mutually reinforcing occupations for women.¹⁴⁰

Reflecting trends described by McPherson, the OCHSN modified its curriculum in 1957 and again in 1967. Associated social changes provided experiences for nursing students that were more similar to those of other young women. For example, photographs, hospital annual reports, and school brochures featured the OCHSN basketball team which competed with other girls' teams in Ottawa, male/female dating relationships such as school dances and parties, sewing prom dresses in the nurses' residence, participation in the Student Nurses Association, and the intermittent production of school year books.¹⁴¹ The "old nurses' dining room in the hospital complete with white linen and maid service" gave way to the hospital cafeteria where "gone are the white damask linen tablecloths and maid service"¹⁴² Still another attempt to normalize the training experience and retain students required a policy change on marriage: "In keeping with modern thinking, the Trustees approved several student policy changes in 1965. The ban against marriage was lifted, and student nurses were now allowed to marry in their third year of training. If any of these newlyweds became pregnant, they could remain in training until the fifth month of pregnancy, then re-enter the School within two years. Students who had left the school to marry between 1959 and 1965 were permitted to return and finish their training."¹⁴³ Unmarried pregnancy received no mention.

While some traditions changed, others remained. Although no male students ever enrolled at the OCHSN, a few male students from Brockville Psychiatric Hospital affiliated with the school for brief periods, as part of their clinical training.¹⁴⁴ The pink uniform was another tradition which never changed, not even in the new "Interne" program of 1957 with its other features of modernization. In contrast to program changes, "there remains, by popular demand, the distinctive

pink Ottawa Civic Hospital uniform which has now earned recognition throughout Canada. The patients, nursing graduates, the hospital trustees, the nurses-in-training themselves—they all returned the same verdict. Those pretty uniforms must stay!"¹⁴⁵

A full-page article in the local newspaper included photographs of early school facilities in comparison with the Intern program, which it described as: "two years of solid basic theory training . . . Then comes the revolutionary third year 'internship.' The undergraduates will receive an allowance of \$130 a month and may live out of residence if they wish." Further, students were to "pay fees as at 'any other institution of higher learning.'" Captions to the photographs emphasized the modern chemistry laboratory, light and space, and the new demonstration room in contrast to long hemlines and wrist-length sleeves from the old program. The reporter commented: "First and foremost in the minds of prospective nurses will be the accent of freedom for the third year 'internes. . . .' 'Many young girls look at three years of strict routine with horror,' said Miss Edith Young, director of nursing education and nursing service."¹⁴⁶ Clearly, the school was interested in changing the image of nurses' training. Less clear were the mixed messages to student nurses who were to be scientifically knowledgeable, technologically competent, morally upright, and pretty (so as to boost morale and aid in healing as in illustration 6.)

Illustration 6: The 1950s Nurse

"What every Hospital Needs! No hospital is complete without pretty nurses-in-training like Miss Joyce Lashley who sweep into a room just when the patient is feeling his lowest. What better morale-booster than such a cheery face?"

Photograph from *The Ottawa Journal*, 19 January 1957, for the article by Helen Parmalee, "'Streamlined' Course to Improve Civic's Nurse Training Program." Used with permission.



Refreshed, appliance, and specialized nurses

The chronic shortage of nurses continued on through the period of delegation. Women's changing work patterns, combined with gradually-improving work conditions in hospitals, resulted in more nurses who remained in the profession, with opportunity to build a different level of expertise. Other nurses returned to the profession after a period of absence and completion of refresher courses which were popular throughout North America. Professional journals of the fifties and sixties offered testimonials from 'refreshed nurses' and enticements from programs looking for nurses to 'refresh.' One such article offered this insight: "My impression is that the larger, prestigious hospitals have one eye on their pension and insurance plans, sick time, and Workman's Compensation—all the while advertising in large type for 'desperately needed R.N.s'"¹⁴⁷ The first OCH refresher course in the spring of 1960 'graduated' a total of seventy-seven nurses, who had previously completed training between 1926 and 1954. The course was advertized as preparing non-practicing nurses to return to active nursing part-time.¹⁴⁸

Within the work culture, nurses sometimes differentiated themselves informally as either 'appliance' nurses or 'career' nurses. "The appliance nurse is there working to get things better in her home as opposed to the career oriented nurse who is there to advance her career."¹⁴⁹ As medical specialties and specialized units emerged during the late fifties and the sixties, a third differentiation as 'specialty nurses' developed. Typically, specialty nurses worked in specific practice areas and began to build particular expertise around the technology which dominated these units. Nurses who developed experience and confidence with technology, thrived in these environments.

Recruitment endeavors, changing work patterns, reconstruction of the professional image, and improved working conditions—all contributed to increased numbers of graduate nurses on staff. But the provincial government's decision to place nurse training in educational institutions provided a driving force which shifted care giving from students to graduate nurses. The OCH would need to hire hundreds of nurses at the beginning of the seventies in anticipation of the change. These

combined influences would shape a different workforce for the next two decades, capable of incorporating delegated roles into nursing practice.

Summary

Delegation met an immediate need related to the shortage of interns and nurses, but the Blood Team was soon unable to keep up with demands to assume more and more technological procedures. One result was that graduate nurses began to share in the responsibility around transfusions and by that sharing, they began to construct their own body of knowledge from a variety of sources. Nurses became increasingly comfortable as they built a repertoire of formal and informal knowledge and skills, tricks of the trade, and self-protective strategies to meet some of the challenges created by the incorporation of technology into patient care. This experiential knowledge integrated art and science components in ways that blurred conventional boundaries between medicine and nursing.

Delegation both facilitated and constrained knowledge construction for nurses. The original plan of physicians teaching and supervising individual nurses regarding delegated acts, gave way to physicians supervising a few nurse educators who then took over the responsibility for teaching and supervising other nurses. Once skills were taught to students through the curriculum, they became accepted as standard competencies for all nurses. As long as nursing education was required to meet the basic needs of novice learners as well as provide a mechanism for the transfer of medical technologies to nursing through these new practitioners, knowledge development necessarily remained focused on procedures and safety. Technological knowledge had shifted from a focus on the equipment and its care, to include strict adherence to routines and procedures as a means of assuring patient and practitioner safety.

For novices, mastery of these procedures and skills brought confidence and pride in their ability to deal with technological aspects of patient care. 'Knowing the principles' began to take on importance through the 1960s, as the number of technologies increased too rapidly to be mastered

in a routinized, rote manner. 'Knowing the principles' also began to change the type of knowledge which nurses developed—from a focus on doing, to a focus on knowing.

Delegation also contributed to complications in patient care. Some of the complications were related to blood's unpredictability which necessitated frequent observation and adjustments which were hampered by changes in hospital architecture and by the multiple responsibilities of nurses in caring for large groups of patients. Responsibility became complicated as nurses sorted out which technologies were permitted, under which circumstances, and how they were currently categorized. Nurses' skills could now be delegated, sanctioned, transferred, or added in relation to individual technologies!

Through the Blood Team, relationships became complicated as delegation introduced a new level of nursing expertise in practice. No longer were all nurses identical in skill set and responsibility. The difference brought power and enhanced status initially, which became diffused as the size of the team grew with the number of technologies added. One member of the nurse technician team felt that status and autonomy were lost as the team became incorporated more fully into mainstream nursing practice. As an alternative view to this changed status, I suggest the loss was related to larger issues within nursing practice and the developing invisibility of the technology.

The decision of what and when to delegate was influenced by power and gender relationships. When nurses identified a need for delegation, the request was forwarded to medical authorities. As in the case of intramuscular injections, the request was not granted on nurses' identification of a patient care need but rather on a request years later, from interns who needed to reduce their workload. And once nursing accepted the role, it remained a nursing responsibility—never reverting to a medical procedure.

To meet the increasing demands which delegation brought to nursing practice (in the midst of nursing shortages), both hospitals and nurses shifted work pattern expectations. Hospitals implemented changes in the work week hours to become consistent with other occupations; they offered more flexible part-time work to attract married women with family obligations; and hospitals

targeted recruitment efforts at nurses who had left the profession through refresher course which focused on technological changes and were strategically scheduled to fit married women's lives.

Nurses' expectations for work were also shaped by social changes for women. Post-war prosperity brought the expansion of families, housing, and suburbia. Nurses who were once discouraged from practicing after marriage, now found they were in demand due to the shortage and that they had a convenient, valuable source of income during this period of rising consumerism. Nurses could remain in practice as 'appliance nurses' as well as 'career nurses.'

With improved working conditions, nurses were able to build experience and expertise beyond the novice level by remaining in/returning to practice. The emergence of specialty units facilitated the pace of delegation and provided an environment within which practice knowledge could develop across medical/nursing boundaries. Through the 1950s and 1960s, a critical mass of experienced nurses began to replace the student workforce. These nurses would influence changes in the way care was delivered, in the requirements for on-going education related to changing technologies, and in knowledge development within nursing science.

Endnotes

1. Kathryn McPherson, *Bedside Matters: The Transformation of Canadian Nursing, 1900-1990* (Toronto: Oxford University Press, 1996): 187.
2. Julie Fairman, "Watchful Vigilance: Nursing Care, Technology, and the Development of Intensive Care Units," *Nursing Research* 41, no. 1 (1992): 56-60 and "New Hospitals, New Nurses, New Spaces: The Development of Intensive Care Units, 1950-1965." Unpublished Ph.D. dissertation, Faculty of Nursing, University of Pennsylvania, 1992.
3. Patricia Crossley, interview by author, tape recording, Ottawa, 26 January 1998.
4. Marjorie Earl, "Blood To Save Babies' Lives," *The Toronto Star Weekly*, 28 February 1948, p. 2; Marjorie Earl, "Red Cross Scheme 'Can Save Rh Babies'," *The Toronto Telegram*, 13 May 1949; no author, "Race Death With Rh Baby," *The Toronto Telegram*, 11 May 1949.
5. "A Danger in Blood Transfusion," WHO Newsletter, VI, no. 2 (February, 1953).
6. Dr. F. B. Bowman with Sidney Katz, "Three Blood Transfusions Out of Four are More Likely to Harm Than to Heal," *Maclean's Magazine* (26 August 1961): 18-21.
7. Letter from D. Bruce Shaw, President of the CRC to Blair Fraser, Editor of *Maclean's Magazine*, dated 23 August 1961; "Too Many Blood Transfusions?" *The Ottawa Journal*, 31 August 1961; and "The Safety of Blood Transfusions: Editorial," reprinted copy from the *Canadian Medical Association Journal*, 9 September 1961. Ottawa: CRCA, loose collection. The main concerns of the CRC and the CMA were that the physician misrepresented the incidence of danger in blood, but also that he went to the public media with the information—with the potential deleterious effect on donations and public acceptance of the physician as 'the one who knows best' when it comes to decisions about transfusion.
8. D. Bruce Shaw, letter to the Editor.
9. Canadian Medical Association, "The Safety of Blood Transfusion, . . . "
10. Examples from the *Canadian Nurse* include: R. L. Denton, "Practical Importance of the Rh Factor," 43, no. 1 (January, 1947): 23-25; W. Stuart Stanbury, "Gamma Globulin," 50, no. 6 (June, 1954): 466-472; H. G. Osborne, "Rh Factor Incompatibility," 45, no. 6 (June, 1949): 415-417; Isabel McKay, "Erythroblastosis Foetalis," 45, no. 6 (June, 1949): 417-420; Lillian Campion, "Fear Factors in Poliomyelitis," 50, no. 6 (June 1954): 475-476; F. D. Simpson, "Transfusion Service," 47, no. 1 (January, 1951): 35-36; Gerald H. Holman, "Erythroblastosis—The Nursing Viewpoint," 57, no. 4 (April, 1961): 335-338; George W. Miller, "Emergency Blood Services," 59, no. 1 (January, 1963): 62-65; and Abraham Levitz, "Reactions to Blood Transfusions," 54, no. 12 (December, 1958): 1105-1106.
11. Jean Kelly, from the OCH Financial Services Office; personal communication with the author, 5 June 1998.
12. Gwen Hefferman, interview by author, tape recording, Ottawa, 29 January, 1998; Crossley, interview.
13. Dr. F. B. Bowman with Sidney Katz, "Three Blood Transfusions Out of Four are More Likely to Harm Than to Heal, . . . ": 19. Dr. T. Gwyn Jones (retired Director of Transfusion

Medicine from the OCH) also recounted his experience of observing a physician who on passing one of his patients in the main hallway of the hospital, told his intern to go and order a transfusion because he looked a little pale; personal communication, 10 April 1998.

14. Hefferman, interview.

15. Both phrases were used by Crossley, interview.

16. A report of the study is found as K. E. Barrett, "Utilization of Blood," Department of Pathology Bulletin 5, no. 3 (December, 1969): 1-2, OCHA. Also: Hefferman, interview.

17. Barrett, "Utilization of Blood,"

18. Hefferman, interview.

19. Dr. H. William Henderson, "Delegation of Special Procedures: The Current Situation," an address to the Session for Chiefs of Staff, Ontario Hospital Association Convention, 1 December 1981, from the files of the College of Nurses of Ontario (hereafter referred to as the CNO).

20. *Ibid.*, p. 3.

21. Helen G. McArthur, "A College of Nurses for Ontario," *Canadian Nurse* 56, no. 6 (January, 1960): 515-518; *The Leaf and the Lamp* (Ottawa: Canadian Nurses Association, 1968): 6-7; and Helen K. Mussallem, "Professional Nurses' Associations," in Alice J. Baumgart and Jenniece Larsen (Eds.) *Canadian Nursing Faces the Future*, 2nd ed. (Toronto: Mosby Year Book, 1992): 495-517.

22. This material has been summarized from Dr. Henderson's presentation, "Delegation of Special Procedures" He also provided details on the requirements and specifications for the training of these specially designated nurses. Emphasis was on written verification of the content taught, the examination process and the periodic re-examination of nurses in these skills. Part of the negotiation process with the RNAO was based on the need for nurses to utilize expanded skills in under-served areas. The final decisions as to what was delegated within a specific hospital were made by the board of trustees and the superintendent with the medical advisory boards. The statement on deletion of acts is found on p. 6 of the document. The RNAO disseminated current information on these acts through the *RNAO News Bulletin* often with a focus on the self-protection strategies nurses should use when participating in delegation. Refer to examples in "Medical Procedures—Important New Notice," *RNAO News Bulletin* 18, no. 1 (January-February, 1962): 1; "Medical Procedures by Nurses," *RNAO News Bulletin* 21, no. 5 (September-October, 1965): 11.

23. Examples of the policies and decisions made in this area can be seen in "Policy on Special Procedures by Registered Nurses and Technical Personnel," report to the CPSO, July, 1967 and correspondence between Laura W. Barr (Executive Director, RNAO) and the CPSO, "Medical Procedures and Registered Nurses," dated 7 June 1967 and 30 December 1969, contained in files from the CNO.

24. "Historical Review of Added Nursing Skills and Sanctioned Medical Acts," unpublished manuscript of the CNO, September, 1979.

25. CNO, "Report of Survey on Technical Nursing Procedures for Registered Nurses and Registered Nursing Assistants," March 1975, from the files of the CNO, Toronto.

26. College of Nurses of Ontario, "Standards of Nursing Practice for Registered Nurses and Registered Nursing Assistants," Toronto, 1976. The standards divided Basic Nursing Skills into A-level and B-level skills (pp. 23-32), Added Nursing Skills (pp. 33-39), and Sanctioned Medical Acts (Delegated Medical Acts), p. 40. Basic nursing skills were those which required both theory and manual skill; the A-level skills were those taught in theory but the nurse may not have had opportunity to practice the skill prior to graduation while the B-level skills had both the teaching and the practice necessary for competence. Added nursing skills were those which had not been taught nor practiced in basic educational programs and therefore, the employing agency was responsible for instruction and supervision. Sanctioned medical acts were those delegated acts from medicine which were accepted by the CNO for nurses performance, following the designated process for delegation. From this beginning statement, the standards were revised in 1989 and 1990.

27. When penicillin was released for civilian use in hospitals after 1944, it was ordered to be given by IM injection every three hours. This responsibility fell on the interns and residents.

28. Margaret Henricks, interview by author, tape recording, Ottawa, 2 February 1998.

29. Jean Milligan, interview by author, tape recording, Ottawa, 29 October 1997.

30. Milligan, interview.

31. Milligan, interview.

32. Henricks, interview.

33. Elizabeth Fenton, retired chief technologist of the OCH Blood Bank from 1943-1985, personal communication with author, 22 May, 1998.

34. Henricks, interview.

35. Ottawa Civic Hospital Annual Report (hereafter referred to as HAR), 1948, p. 52.

36. Minutes, General Medical Board, 26 November 1953, COA, MG 38.

37. Minutes, General Medical Board, 16 December 1955, COA, MG 38.

38. Minutes, Medical Advisory Board, 8 April 1952, COA, MG 38, box 17.

39. Minutes, General Medical Board, 29 September 1954, COA, MG 38.

40. Donna Martin, interview with author, Ottawa, 1 April 1998.

41. Martin, interview.

42. Martin, interview.

43. HAR, 1962.

44. Henricks, interview.

45. According to the Martin interview, in 1984, the new manager of the Nurse Technician team felt that blood transfusions were not being adequately managed. Bedside nurses still saw the team as primarily responsible for the blood although they were now only starting the transfusion. The manager implemented a policy change which made the bedside nurse responsible for both the hanging of the blood and the subsequent management of it. The team would now only start the IV and hang saline in preparation for the nurse to then give the transfusion.

46. This procedure is illustrated in a popular nursing textbook of the time: Bertha Harmer and Virginia Henderson. *Textbook of the Principles and Practice of Nursing*, 4th ed. (New York: The Macmillan Company, 1939): 268.

47. Minutes, Faculty Organization Folder, 15 January 1947, COA, OCHSN, box 6.

48. Minutes, General Medical Board, 28 September 1951, COA, MG 38.

49. Nursing policy book, 15 February 1954 and also "Blood pressure procedure" dated July, 1954 from the Nursing Procedures Book, OCHA.

50. Memo from B. Jean Milligan (Assistant Director), 15 June 1966, OCHA.

51. Minutes, Finances and Property Committee, 5 February 1947, COA, MG 38, box 10.

52. Minutes, General Medical Board, 11 October 1950; 25 November 1953; 15 December 1954; COA, MG 38. See also minutes, Medical Advisory Board, 25 September 1953, COA, MG 38, box 11.

53. Hefferman, interview.

54. Minutes, Medical Advisory Board, 18 November 1954, COA, MG 38, box 11.

55. Crossley, interview.

56. The Canadian wide survey of nursing education was in progress from 1958 and the report published in 1960, offering an excellent view of the state of education. Refer to Helen K. Mussallem, *Royal Commission on Health Services: Nursing Education in Canada*, 1964 (Queen's Printer, 1965). As well, the provincial nursing study by V. V. Murray, *Nursing in Ontario: A Study for the Committee on the Healing Arts* (Toronto: Queen's Printer, 1970) was conducted through the late sixties and as such, presents a slightly later overview of the issues.

57. The implementation of this new program was featured in the local newspaper, complete with contrasting photos from the early facilities and experiences at the OCH School of Nursing. Helen Parmelee, "'Streamlined' Course to Improve Civic's Nurse Training Program," *The Ottawa Journal*, 19 January 1957.

58. Further descriptions of these two programs can be found in Valerie Knowles, *Leaving with a Red Rose: A History of the Ottawa Civic Hospital School of Nursing*. Ottawa: Deneau Publishers and Company Ltd., 1981 and in the OCHA files on curricula.

59. Knowles, *Leaving with a Red Rose* . . . , 159.

60. Hefferman, interview.

61. Hefferman, interview.

62. When nurse practitioners (NPs) were introduced in the 1960s, physicians were once again called upon as teachers of nurses until more nurses with graduate degrees became available to teach in NP programs where upon physicians lost control of the educational process again. Julie Fairman explored this process which she labelled as 'clinical thinking' in "Delegated by Default?: Analyzing Medical Technology Transfer From Physicians to Nurses, The Case of Physical Diagnosis, 1960-1975," a paper presented at the American Association for the History of Medicine, Toronto, 6-8 May 1998 (cited with permission of the author).

63. Hefferman, interview.

64. Florence Kinsella, interview by author, tape recording, Ottawa, 24 February 1998.

65. Crossley, interview.

66. Hefferman, interview.

67. Hefferman, interview.

68. Refer to the "Record of Clinical Teaching," COA, OCHSN, box 15. The photograph is contained in the "History of the OCH School of Nursing" scrapbook created by Jean Milligan, at the OCHA. The wall calendar in the photograph is dated May, 1955.

69. Kathy Slattery, interview by author, tape recording, Ottawa, 10 February 1998.

70. Milligan, interview.

71. Isabel Simister, interview by author, tape recording, Ottawa, 22 January 1998.

72. Simister, interview.

73. Simister, interview.

74. Kinsella, interview.

75. Hefferman, interview.

76. Kinsella, interview.

77. Henricks, interview.

78. Crossley, interview.

79. Slattery, interview.

80. Slattery, interview.

81. Hefferman, interview.

82. Crossley, interview.

83. Hefferman, interview.

84. Kinsella, interview.

85. A. D. Farr, "Blood Transfusion and 'Religion,'" *Nursing Mirror and Midwives Journal*, (5 July, 1968): 28-29. According to this article, some of the scripture references on which the Jehovah's Witnesses have based their beliefs are: Genesis 9:3-4; Leviticus 3:17; Leviticus 17:10; Acts 15:20, 29.

86. Hefferman, interview.

87. Crossley, interview.

88. Slattery, interview.

89. Hefferman, interview. The technician was allowed greater discretion to 'needle' the transfusion line. This procedure involved using a syringe to clear a sluggish needle or tubing by flushing it with saline.

90. Crossley, interview.

91. Simister, interview.

92. Hefferman, interview.

93. "Advise to the Probie," 1956 Annual Year Book , COA, OCHSN, p. 19.

94. Crossley, interview.

95. Slattery, interview. This expectation and penalty were also described in the Kinsella and Crossley interviews.

96. A discussion of graduate nurses performance evaluation is briefly included in the evidence from the Judicial Inquiry, 1949, vol. 3: 108-110, COA, MG 38, vol. 36.

97. Dr. T. Gwynford Jones, interview with the author, Ottawa, 12 April, 1998.

98. Kinsella, interview.

99. Crossley, interview.

100. Crossley, interview.

101. Henricks, interview.

102. Simister, interview.

103. Kinsella, interview.

104. Slattery, interview.

105. Crossley, interview.
106. Kinsella, interview; Hefferman, interview.
107. Kinsella, interview.
108. Crossley, interview.
109. Crossley, interview.
110. Crossley, interview.
111. Henricks, interview. The Nursing Procedures Book, Transfusion policy revised March 1953, pp. 203-204, confirmed that the RN hung the blood and the physician set the rate. OCHA.
112. Henricks, interview.
113. Hefferman, interview.
114. Milligan, interview.
115. Slattery, interview.
116. Hefferman, interview.
117. Crossley, interview.
118. Kinsella, interview.
119. Hefferman, interview.
120. Henricks, interview.
121. Kinsella, interview.
122. Minutes, OCH General Medical Board, 26 November 1953, COA, MG 38.
123. Hefferman, iinterview.
124. "Blood Transfusion," Functions of Assistant Nursing Arts Instructor, 1952, p. 127-128. Binder in the OCHA.
125. Henricks, interview.
126. Procedure books, OCHA.
127. Hefferman, interview.
128. Procedure books, OCHA.
129. Hefferman, interview.

130. Crossley, interview.
131. Hefferman, interview.
132. Henricks, interview.
133. Crossley, interview.
134. Slattery, interview.
135. Crossley, interview.
136. Loose papers dated March 1, 1976 and contained in the SMA binder on delegated acts, OCHA. Venipuncture was a closely-related technology to blood transfusion; based on achieving certain criteria for staffing, the Board of Trustees decided to implement a three-month trial with venipuncture for nurses working in the Emergency Department. A summary of similar decision rationales is included in a letter from B. Jean Milligan to Shirley Kerr, 5 February 1975, OCHA.
137. Copies of one of these plays (dated 1958), were retained in the OCHA.
138. McPherson, *Bedside Matters:*, 167.
139. *Ibid.*, 189.
140. *Ibid.*, 203.
141. These artifacts are described in the HARs, photographs, and the alumnae association newsletters. As well, many examples exist in the OCHA, as well as at the COA.
142. These were the captions underneath photographs of the old dining room facility and the cafeteria in Knowles, *Leaving with a Red Rose:*, unpaginated photo section.
143. "*Fisher's Folly: A History of the Ottawa Civic Hospital, 1924-1984* (Ottawa: Banfield-Seguín Ltd.), (n. a., n. d.): 27. A copy of this anniversary brochure can be found at the OCH library.
144. Hefferman, interview.
145. Parmalee, "'Streamlined' Course"
146. *Ibid.*
147. Elizabeth Worley, "Monsters, Monitors, and the Merry Mouseketeers," *American Journal of Nursing* 69, no. 7 (July, 1969): p.1445.
148. HAR, 1960; see also loose news clippings, "Wives Going Back to Nursing: Unique Refresher Course at Civic Hospital," dated 1960, OCHA.
149. Hefferman, interview.

Chapter 5

'ROOTED IN THE PRACTICE OF NURSING': THE PERIOD OF INCORPORATION, 1970-1990

Closure of the hospital-based School of Nursing and growing reliance on graduate nurses facilitated a third period in blood transfusions, during which the technology became "something that nurses had done over the years for so long, that it became rooted in the practice of nursing."¹ In the midst of myriad social influences (such as feminism, unionism and consumerism), nurses continued to construct the practice knowledge they needed to manage technology.² Some of the challenges related to specialization, to their different needs as graduate nurses (who had replaced students as care givers), and to the replacement of nursing instructors who had moved into the community college system with the students. Regulatory bodies dealt with the rapid expansion of nursing knowledge and skills by introducing standards of practice in place of skill lists, thus providing a bridge between delegated medical acts and nursing competencies. Throughout the process, both leadership and practice nurses also shaped technology through forms of resistance.

Technology continued to complicate care giving by requiring additional equipment, procedures and knowledge. Patient information and consent, efficiency and economics related to the utilization of nurses' time, and decision making based on research and practice realities were among the emerging issues. Furthermore, after delegation established the legal channel for transferring medical technologies to nurses, specialty practice increased the speed at which it took place. As one nurse pointed out, "It was mainly the thrust of the new technology coming down the

track. I mean in the 50's, did we do cardiac monitoring? Did we do CVP's? Did we do dialysis? That was all just emerging Technology drove us."³

Nurses' work patterns from the mid-1970s reflected periodic cycles of over supply and shortage. A commonly expressed view was that: if nurses didn't take on emerging technological roles, some other care provider would be introduced to the system and contribute to job loss.⁴ However, some experienced nurses found a measure of power and control over their work lives based on expertise. Others felt undervalued, limited in their roles, and forced away from bedside practice to seek more effective ways of influencing patient care.

Nursing science and institutional workload influenced a shift in responsibility to nurses as the administration of blood became a basic competency for entry to practice. But becoming rooted in nursing practice also meant becoming invisible--disappearing from official records and annual reports. Transfusion no longer counted as something different, nor was it 'counted' statistically as workload. This invisibility had implications for the professional in that the technology was subsumed in routine care as a task and undervalued as knowledge work.

This chapter continues to examine how blood transfusions during the period after 1970, shaped and were shaped by nurses' roles and responsibilities, through the three themes of knowledge construction, technology complicates things, and work patterns. Analysis suggests that: the implementation of a graduate nurse work force allowed for a different level of knowledge construction and integration between science and practice; technological competence and confidence contributed to changed professional relationships; social forces and nursing ideology shifted towards greater accountability to the patient; and practice nurses struggled for recognition and opportunity to enact advanced roles.

Construction of Knowledge

Knowledge construction during this period was influenced by the needs of new learners, the need to master new content, changes in the delegation process which brought new regulations, newly created roles for nurses, and on-going resistance from a variety of sources. As long as there

was a School of Nursing associated with the hospital, there had been a built-in mechanism for teaching new techniques and updating knowledge through the students. They formed a captive audience who were subsequently supervised by clinical instructors. As well, the number of students accepted into training could easily and quickly adjust to the supply and demand for graduates. In times of over supply of graduate nurses, the size of the entering class could be reduced while in times of staffing shortage, the size of the class could be increased.⁵ Although students were 'in training,' they began to meet service needs upon admission through their clinical placements. But after 1973, that flexible resource was no longer available to the hospital.

Two processes were occurring as the technology became routinized. Nurses became 'knowers' as they moved from managing the equipment and product, to the application of the technology in patient care, to making decisions and advocating for patients concerning the technology. As a nurse educator commented, "It's just not that nurses are smarter, it's that the knowledge base has changed and the expectations have changed and nurses have always responded to the challenge of doing more."⁶ And blood technology became invisible as nurses integrated it into patient care activities. Invisibility however did not mean less caution or less vigilance according to the emergency department nurse who remarked, "We had grown up respecting blood and what it could do and knowing that we have to be so careful with our surveillance, I don't think that we have ever dropped that."⁷

New learners

Since students were now prepared outside the auspices of the hospital and had clinical experiences in a variety of agencies, they were no longer as indoctrinated with routines and policies specific to the OCH. Therefore, they required a period of additional support prior to assuming full graduate nurse roles and constituted only one part of the group of new learners which the hospital had to accommodate. A 1975 report stated:

The graduate of today is not prepared to assume full responsibilities when she comes on staff. All have a four week basic orientation program, which has to be followed by close supervision. Nurses going into specialty areas require additional help. Students are well-prepared academically but do not have sufficient clinical experience to meet our needs. They require from four to six months to reach a satisfactory level. During this period a great deal of part time staff must be used.⁸

Graduates of the late 1960s and early 1970s did not recall specific, formal learning sessions related to transfusions. "I remember doing finger pricks on each other to see what type of blood we were. They must have had a lab for us though, I mean it was so important I would have hoped that I would have hung blood, I don't remember getting out of nursing school feeling that there was a competency that I had not had the opportunity to do it at least once. So I must have done that in my training and then graduated that year."⁹

Another group of learners included an unprecedented number of graduate nurses, newly-hired during the early seventies in anticipation of the school's closure. "There were a fair number of us that were new graduates in the area and so sometimes it was 'the new' leading 'the new.'--the novices The team leader role was really important for the new graduates because that was the person we looked up to as our role model and if we had any type of clinical questions that we would go and use them as our resource There wasn't anybody to ease that transition from school to the real practice setting."¹⁰

A third group of learners were nurses who had been employed for a period of time, but found themselves practicing in a rapidly changing environment of technology requiring new responsibilities.

We weren't only concerned about the new graduates and their need for more intense, supervised clinical practice and learning--what we would now call added nursing skills (skills that were not necessarily taught in the basic nursing program), but we also had a workforce of nurses (existing nurses) who had learning needs to keep up with the advancing

technology. And so that whole group of our existing staff-- we were trying to encourage them to become involved in educational activities recognizing that once a 'nurse, always a nurse' [was] not right. . . . that what you learned today may be obsolete tomorrow.¹¹

Nursing administration carried the responsibility for staffing this large facility (over 1100 beds during the mid-seventies) during a time of expanded specialty services. Basic education programs were unable to incorporate all of the new learning needs in addition to basic knowledge and competencies. In 1964, the Royal Commission on Nursing Education pointed out that "the concept of specialty preparation for beginning practitioners in nursing is considered unsound."¹² In 1970, a provincial study on nursing in Ontario reiterated the difficulty in meeting educational needs of two diverse groups of learners, through a discussion on the ineffective utilization of nursing resources.¹³ The Assistant Executive Director of the hospital (who was also the administrator of the School of Nursing and Nursing Service, 1964 to 1979) recalled that:

You had to set up courses for [staff nurses], because there was very little provided. We went through this with a whole lot of things There was this explosion of knowledge. You didn't have the community colleges and universities training these people to do anything. The hospital was left The hospitals had to find out how to look after [the patients] . . . you had to set up in-service programs to teach them and it was difficult . . . for the nurses wanted to do it, but they were worried sometimes because they didn't know how to do these things.¹⁴

To meet these on-going needs for learning, the hospital created a new position--the clinical nurse educator whose responsibility was to cover learning needs on specific clinical units. Their role had both formal and informal teaching components--covering orientations, new procedures, problem solving patient care situations, and role modeling.¹⁵ During this time, many nurses felt limited by their basic training and returned to school for courses in physical assessment and critical care or in-house

workshops to enhance knowledge and technique. When the decision was made to set up an Intensive Care Unit and later a Cardiac Unit, small core groups of nurses took introductory courses in the United States.¹⁶ Reflecting on her experiences during these changes, one nurse said:

It was hard and often times you wondered how you got through it! But then too . . . we didn't do . . . the assessing . . . because it was mostly physical observation. Your temperature, blood pressure and pulse were basically what we did. You looked at their color and you observed their respirations but you didn't assess their chests or edema and all that. It wasn't the same priority. It was mostly an eye observation . . . a touch . . . a feel . . . if diaphoretic . . . because we weren't allowed or we were never taught to listen to chests and abdomens other than to observe the size, that they were increasing in size and were hard That wasn't something that we had been taught.¹⁷

Nurses remained in the profession with an ensuing continuity in practice which expedited development of expertise as novice practitioners moved through beginner to expert levels of practice.¹⁸ Some nurses also sought and achieved additional preparation through post-basic university programs of nursing¹⁹ and even fewer nurses accessed graduate nursing programs where nursing science was being actively encouraged.²⁰

New content

Within the wider OCH context, new demands for nursing knowledge came with the opening of specialty units and medical procedures. An abbreviated survey of these developments at the OCH includes: the establishment of a Recovery Room in 1954, a Cobalt 60 Therapy cancer treatment unit in 1956, a sixteen-bed Intensive Care Unit in 1962, a neurology unit in 1963, dialysis in 1964, the first kidney transplant in 1966, a cardiac arrest program along with the newly established Cardiac Unit in 1968, a high-risk pregnancy unit in 1979, and the first heart transplant in 1984.

Emerging specialty units challenged the breadth and depth of knowledge and skills required by nurses who staffed them and willingly assumed new roles and responsibilities in these units. Nurses responded to increased opportunities and demands with their own practice evolutions related to patient acuity, needs for surveillance and the use of technology.²¹ The advent of new equipment such as oscilloscopes for monitoring heart rhythms, Bennet and Bird respirators, transducers for arterial and venous pressure measurements, manometers for central venous measurement, defibrillators and various catheters and tubes for drainage, brought new language for the nurse: Donna Zschoche and Lillian E. Brown illustrated the change in their 1969 journal article: "Pistons, valves, switches, magnets, inspiratory and expiratory time, Cournard's curve, proximal airway pressure, pressure gradients and peripheral lung pressures, alveoli-capillary blocks, shunting, and hyalinization are terms familiar to her [the nurse]."²²

Over a relatively brief time span, nurses gained experience and constructed related knowledge for these areas, as they moved from managing equipment and following procedures to clinical judgements about patient status and needs for certain interventions. They moved from users of oxygen tanks and tents, to clinical decision- making based on the patient's presentation and pulse oximetry; from managing ventilators to advanced support skills in ventilatory weaning. Nurses moved from the collection of urine samples to determination of blood sugar by glucometer readings, and interventions based on protocols. Nurses went from reporting pulses, to the interpretation of electrocardiographic tracings and defibrillation in emergencies.

In transfusion, knowledge requirements expanded to include: applications for special medical populations (such as hemophilia, oncology, dialysis, and cardiology); use of blood components and alternatives to blood; alternatives to allogeneic blood use; and issues associated with blood-borne transmission of disease. Each innovation brought challenges for nursing related to supportive care requirements, the type of products used, infection control, and decision making criteria depending on the underlying pathology. As one nurse put it, "we got smarter with what we could do with our blood."²³ But it was the identification of HIV and Hepatitis C as transmissible by blood which dramatically changed the way blood was understood and used. Infection control

concepts changed to consider all persons as potentially infected, resulting in the implementation of universal precautions. As well, nurses now had to deal with the public's suspicions and fears related to blood products.

Nurses recalled the mid-1980s as a time of definite change in attitudes and utilization of blood products: "When the scare of HIV came . . . you looked at blood in an entirely different light. Not only the recipient of blood and what was down the road for them . . . you also had a fear of 'did I have blood during that time and could I be a candidate for these terrible conditions that are coming because of the blood situation?' So I always had respect for it [which] became a fear as time went on."²⁴ "HIV was the one thing that made people [patients and nurses] realize they should be more careful."²⁵ "I think people became much more vigilant and concerned about 'do I really need to have a transfusion?' And then you had the move towards donating your own blood."²⁶ "It's quite a change to think about feeling bad about having hung something on somebody."²⁷ Interestingly nurses did not talk about their own risk of exposure in handling blood products, yet risk was present with every transfusion and every venipuncture or invasive procedure in which they participated.

New regulations

The incorporation of medical technologies into nursing practice was guided from the mid-forties by the formalized process of delegation (refer to the previous discussion in Chapter four). The list of delegated and sanctioned medical acts increased over the years with acts deleted when accepted as part of nursing's scope of practice. Most of the delegated acts involved the use of technology in some form or the other, and the lists grew rapidly over the 1970s and 1980s. Regulatory bodies found it difficult to maintain current lists and considered an alternative framework to guide practice.

Based on the provincial survey conducted by the CNO in 1975, a joint committee of the CPSO, OHA, RNAO, and CNO subsequently approved standards of practice for nurses which classified nursing competencies into basic skills, added nursing skills, and sanctioned medical acts.²⁸ (Refer to the discussion on delegation in Chapter four.) These standards required revision every one

to two years through the late 1980s, to keep up with the changes in practice. The 1989 standards classified blood transfusion as a basic skill for nurses, including the addition of blood by central lines and the regulation of flow rates. Transfusing blood under pressure and flushing lines, however, remained an added nursing skill.

When the standards were re-issued in 1990, major changes were evident in the way skills were addressed. Added nursing skills and sanctioned medical acts were removed from the lists and replaced by a second, parallel document entitled, "Guidelines for Decisionmaking About Added Nursing Skills and Sanctioned Medical Acts."²⁹ The guidelines essentially made the individual nurse the final judge of her or his own competence, with the responsibility for seeking further education as needed in the performance of specific skills. It also included the most current list of delegated and sanctioned acts. In these standards, basic skills were incorporated under the nursing process, as 'strategies and interventions.' There was no specific mention of blood transfusion in this revision, as it became incorporated and invisible in the new regulations. The accompanying guidelines explained that:

Skills lists, which were appended to previous versions of the standards, focused primarily on technical or psychomotor nursing skills. The new approach to skills in these standards emphasizes the knowledge, decision making techniques, and communication techniques that RNs [Registered Nurses] and RNAs [Registered Nursing Assistants] must use in a time of rapid technological advancement, changing delivery patterns, and increasing complexity of care. It also reflects a shift in nursing from task orientation to goal orientation and integrates the performance of skills into the nursing process.³⁰

The Regulated Health Profession Act of 1993 brought further changes in understanding scope of practice. The Act covered twenty-one health professions (including medicine and nursing) under one common legislation. "This act recognizes a scope of practice which is not specific to each profession and describes in a general way what each profession does and acknowledges the overlap

among the different health professions."³¹ A unique component of this legislation is that it licensed specific acts rather than individuals, restricting the performance of those acts which were potentially harmful if performed by unqualified persons.³²

Reflecting the evolving regulatory changes, policy changes made staff nurses at the OCH responsible for all aspects of blood administration except the original venipuncture. Hospital expectations for technological competence with transfusion now included: monitoring lab values, initiating the transfusion ('hanging' blood), verifying the identification of patients and products, vigilance in the assessment and monitoring of the infusion, patient advocacy and informed consent, teaching, problem solving and decision making. Venipuncture and blood procurement were finally added to the staff nurse role in 1997. As physicians became further removed from the technology, nurses were now the persons more familiar with the equipment, the procedure, and the implementation knowledge surrounding it.

New roles

An on-going debate was and still is, should nurses take on technological roles and who decides? Leadership commonly expressed the perception that in technology, physicians "foist unwanted tasks off on to nurses" and seek to "control nursing for their own benefit."³³ American nurse leader, Virginia Henderson firmly articulated her stance in 1955: "The average nurse subjects the patient to a medical risk and herself to a charge of malpractice It is wasteful to convert nurses into medical technicians."³⁴ The other side of the debate was less visible and less audible, as practice nurses steadily expanded roles and became comfortable with technology in many forms. They became competent technicians, knowers as well as doers, educators for patients, families, and communities; they also became specialists, advocates, and change agents.

In the process of becoming competent technicians, nurses commented: "I am not afraid of the equipment, I am not afraid of IV's, I know what I am doing, I know what I am looking for so it's just something that I can do;"³⁵ and "It was just an expectation that you would provide nursing care treatments that were [to be] provided or something you had the technical skill to do . . . not only

[did you] control the flow of the blood or the IV, but you had the knowledge and ability to observe and note untoward outcomes."³⁶ Nurses saw transfusion and its related technology as "something for the patients So, 'Let's do it and do it right.' And they are organized people; they know their asepsis . . . I think they are doers It's part of the care for the patient and let's get it in and let's get it done and let's get this person feeling better."³⁷

Nurses had been described previously as the physicians' hands and feet, related to the tasks they performed.³⁸ Through the sixties and seventies, they were increasingly perceived as the 'eyes and ears' in relation to the advent of monitoring roles which required their continual bedside presence and surveillance. A nurse educator explained, "Nurses have always been the eyes and the ears and we have always had that accountability to identify any high risk situations . . . so we are always there."³⁹ After the hands, feet, eyes, and ears, the nurse began to emerge through another analogy as the head, referring to the knowledge aspect. A 1970 nursing study provided the following illustration of the changing role in which art and science integrated, and technological knowing developed:

She [the nurse] is partially his [the physician's] head as well, because she must have some of the training that he has to be able to judge how the patient is responding to treatment She often does take the first step in diagnosis, which is to make a preliminary and temporary judgement about how sick a patient is. On the basis of such a judgement she may or may not decide to call a physician . . . the nurse must be able to detect subtle indications which are meaningful to only a well-trained and experienced person.⁴⁰

A strong trust developed between physicians and nurses in early specialty units, related to their shared learning experiences in a new knowledge area. As one cardiac surgeon described nurses in the emerging cardiac unit at the OCH in the late 1960s, it was clear from his description, that he watched along with the nurses--he developed a sense of what nurses did, what they observed, and what they knew. Dr. Wilbert Keon stated:

I always felt that probably the most vital thing for a patient was the nurse's knowledge. So I wasn't the kind of person that would come up to the bottom of the bed and say, "What's the blood pressure, what's the heart rate, what are the electrolytes, . . ." or this kind of thing. I would say, "How's the patient?". . . because there were a thousand things there, that the nurse was seeing and monitoring, that she wasn't reporting and charting . . . just from their experience.⁴¹

Although teaching patients and families was not a new role for nurses, it took on added importance as a result of the hospital's study on blood utilization in 1969 and the changing acceptability of transfusion through the next decades. The search for alternatives to blood transfusion stimulated a reconsideration of dietary sources of iron for its hemoglobin-binding capacity. Nurses took on a major role in teaching and re-enforcing nutrition information. A graduate of the class of 1958 pointed out that, "In the last ten to fifteen years . . . they pulled back from blood and the patient was started on iron. You taught as part of your discharge planning. You either had the nutritionist come or you got out the book yourself and you did a lot of teaching We have given way more [emphasis] to nutrition to build up people, than we did years ago."⁴² Teaching also included treatment rationale and medications related to blood: "We ha[d] some explaining to do, as to the fact that they had surgery and there was blood loss and this [was] a replacement I think they let the hemoglobin go lower and sent [the patient] home with a bag of ferrous sulphate . . . in fact, it was started right after surgery."⁴³

Another role which was not actually new, but which took on different priority and dimensions was patient advocate. Nurses became the intermediary between physicians and patients partially because they were the ones at the bedside with understanding of the language and hierarchy. At the OCH, they also began raising more questions about patient care choices. Nurses commented: "The average practice nurse on the units . . . became much more vocal, particularly as the years went . . . and contaminated blood [became an issue]. Because patients were questioning it

Nurses are more advocates for patients now and patients are advocates for themselves now. They don't take anything without asking."⁴⁴ By the eighties and nineties, another nurse said, "Come on, let's think of what is better for care here and what in the long run may be easier."⁴⁵

For example, nurses questioned the amount of blood needed and the rate at which it should be given based on the impact of adding volume over time: "We had a time limit of when the blood had to be hung. A doctor would write how long a period to give the blood over, and if we had any questions--for instance, this was a very small person . . . this was a person with a bad heart-- then we would have contacted him and asked: 'How long do you want this to run?' because we were concerned about the overloading of this person."⁴⁶ Fairman pointed out in her research, that the question of ownership of a technology was related to control, to the authority to use and/or adjust parameters to benefit patients.⁴⁷ As nurses developed the experiential knowledge and confidence to make decisions and take initiatives, they were also sharing in the ownership.

Nurses learned to go beyond questioning technological interventions and advocating for patients, to participation as change agents for improved care. The clinical nurse specialist in the Emergency Department described one of the changes she initiated: "We never had a cardiac arrest sheet before and people would be writing after an arrest. They wouldn't remember most of the time sequence, because we don't have time to write. And I thought, 'You don't need to write, you can have a tick [form] . . . the procedure is the same each time.' So I designed the first cardiac arrest sheet from watching [the procedure]."⁴⁸ Another of her changes improved continuity for physician coverage in the Emergency Department: "There was no orientation program at that time for physicians and med[ical] students. And of course, every time July and August came, all hell broke loose. It didn't need to be like this. But it [needed someone] saying, 'You know, what can we do to improve?' Then finally, just doing it--but to analyze and be objective about it, and make sure you have good evidence. You can't just do it on a whim. I have been through that same process with other things as well."⁴⁹

In their concerns for patients, not all the changes which nurses attempted were appropriate ones. Finding ways to warm blood and prevent hypothermia had been a reoccurring issue for nurses

since the 1940s. From flasks set in basins of warm water, tubing run through water baths, and blood warming machines which they refused to use, nurses resorted to microwave ovens in an attempt to find a solution. By the 1970s to 1990s, they were comfortable with microwave ovens as part of everyday life, in contrast to the blood warming units of the earlier period, which had been foreign to their experience. As a nurse recalled,

I was thinking about the issue of warming blood right . . . how you don't want [trauma patients] hypothermic, particularly when a lot of our trauma patients come in at a temp of thirty-three or thirty-four [degrees Celsius]. And so the last thing we want to do is drop it [the temperature]. And so, there were instances where people had tried to microwave blood. And we had been taught then, that you don't do that, it's the same as the dialysate--because they get hot spots and then . . . they have burns in the peritoneal cavity and stuff and it is the same thing with the blood. And so that was a real problem.⁵⁰

Advanced practice as a new role offered a possibility to retain expertise at the practice level, to recognize and foster the integration of art and science in nursing. But the role was never fully developed or empowered at the OCH. Between 1968 and 1978, two persons at the OCH had the title and preparation as Clinical Nurse Specialists (CNS).⁵¹ Both nurses eventually moved into other roles with administrative components within only a few years. As one former CNS commented:

My reason for moving out of the CNS role and into the Heart Institute as a coordinator, was that there was not an understanding of what the CNS role was at that time. And there was a review of positions done here at the hospital in . . . around 1979 . . . and because I was a 'one of a kind,' . . . they did a study and no one really understood the role. They basically said you know, there was "no room for 'one of a kind' positions and you are more valuable in an education position." And I said, "no, I want to be more involved in patient care and influencing practice."⁵²

Reflecting back on the achievements for patient care and practice during her two years in the role, she added, "It was a shame the role ended when it did there. You know, because I really didn't want to leave."

A critical mass of experienced practice nurses did not begin to build until after the seventies. Several times, the CNS role "almost 'took off' but the senior hospital personnel including nursing, did not know how do deal with us."⁵³ One nurse decided to move into administration because she was unable to effect patient care changes while remaining as an expert practice nurse. She shared her personal ambivalence over the choice: "I said I was being stifled I have always looked back and thought, 'You never know what your career might have done, eh?' And I thought what it could have been . . . and in the year and a half to two years that I was there . . . I thought I did a lot Anyway, I had a lot of ideas."⁵⁴

Old resistance or 'not taking on more'

Not everyone was in agreement to nurses taking on increasingly technological roles. An article from 1974, gave insight to sources of resistance nurses encountered as they sought practice opportunities. The author described these sources as: licensure regulations; the employing agency through policies and failure to provide adequate space, equipment or back up services; and co-workers (including physicians, other nurses, health care consumers, and the nurse her or himself).⁵⁵ Some analysts maintained that "it appears that R.N.'s have at best a veto power, in deciding what cure procedures they will engage in; and that, . . . is seldom--if ever--exercised."⁵⁶

Physicians expressed their concerns that nurses were no longer meeting their need for assistants:

The major concern of the spokesmen of associations of physicians is that nurse[s] be available to participate more fully in cure activities. Their feeling is that the nursing profession has not been keeping up with the immense advances in diagnostic and therapeutic knowledge and procedures since the Second World War and, as a result, nurses

are less able to assist the physician than in the past This view is clearly opposite to that prevalent in the nursing profession, that the uniqueness of nursing is its provision of bedside care and that the profession should therefore resist all attempts to have nurses perform more direct cure activities.⁵⁷

From practice nurses, the picture appeared somewhat differently. There was a discrepancy between novice and experienced nurses' attitudes. Members of the OCH Advisory Nursing Committee noted that "Junior nurses are often anxious to take on more procedures, sometimes without adequate instructions. More senior nurses are concerned about the 1) time consuming element of carrying out some of the procedures, 2) the necessity to increase staff to do nursing duties, 3) the teaching time involved."⁵⁸ Further discrepancies were noted between the bedside nurse and the leadership: "There was a tradition . . . a lot of nursing leaders who had very . . . black and white vision as to what the nursing role was, and what the physician role was, and you didn't cross that path. Some of it may have had some [legal] liability overtones, some of it may have just been attitudes."⁵⁹

In 1976, a pilot project was approved for nurses of the Emergency Department to do their own blood work and venipuncture, and therefore initiate transfusions as well. Not all of the nurses were equally enthusiastic with the added responsibility: The clinical nurse specialist recalled that, "I was specifically looking at ways to try to save time and improve care . . . I couldn't understand why they weren't starting their own IV's in Emerg[ency]. By the time you go and write it in the book, call the IV team . . . when I looked at it, I thought, 'This is ludicrous' . . . And people were not happy about that--I mean, they said it wasn't right and nursing shouldn't do this technical stuff."⁶⁰

Staff nurses were not powerless although the 'veto' was not always expressed audibly. Nurses resisted change in a variety of ways, some of which were more successful than others. When they became responsible for starting the intravenous lines, they knew that 'running blood' required a large bore needle--but these were harder to insert and the clinical nurse educator found

that she had "another challenge . . . to ensure that [nurses] always had an 18 gauge or larger catheter in."⁶¹

The PRN [pro re nata] adaptor became popular with nurses because it provided convenience and less risk of spillage with blood, while initiating the transfusion line. It fit on the intravenous device at the insertion site, like a cap which allowed intermittent access to the vein by puncturing it with another needle. Access through the PRN adapter was easy and quick for nurses as well as patients. But it was a policy requirement that blood be run directly into the intravenous device, not through the adapter. "The other challenge was ensuring that they didn't piggy back the blood into the IV tubing. . . you see, when we got the PRN adaptors, everybody loved them . . . because you just needed in, and that was wonderful. You can't do that with blood and so it was really a challenge here, to go back and say, 'Look, you know you have to take the PRN adaptor off; you have to hook up directly to the blood.'"⁶²

As transfusion became integrated into practice, nurses built on prior knowledge pertaining to the functions, composition, and uses of blood. They used their accumulated experiential knowledge from the art of transfusion, in application to new content and expanded roles such as teaching, advocacy, and decision making. Along the way, different teaching strategies were developed to address the variety of learning needs created by a new mix of graduate nurses. Although the procedure became common place, nurses continued to be vigilant with blood, treating it with a sense of respect and caution not afforded other technologies.⁶³ It was this extra attention to detail which often created complications for patient care.

Technology Complicates Things

Some of the ways care was complicated arose from issues surrounding infection transmission and control, the use of alternatives to transfusion, patient information and consent, new medical applications, and equipment innovations. Administrators began to include nurses in decisions over which technologies they would assume. Economic constraints and rationalization of health care in general, called for the re-examination of technologies on the basis of efficiency and

efficacy. At the OCH, it seemed as though something new was always being introduced and change was the only constant. Nurses who chose to remain in hospital settings became relatively confident with medical technology. While community nursing practice initially presented employment options for nurses who preferred a less technological setting, medical technology moved increasingly into the patient's home as well.

Infection transmission

The major complication in blood technology during this period concerned the transmission of blood-borne infections. When Acquired Immunodeficiency Syndrome (AIDS) was first identified in North America, it was considered to be limited to a small, marginalized portion of the population. The lengthy period of incubation for HIV prior to sero-conversion, lack of diagnostic capability, and lack of knowledge regarding its transmissibility contributed to a false sense of safety regarding the all-volunteer Canadian blood supply. The virus from infected blood donors contaminated portions of the blood supply. As the evidence for transmissibility began accumulating in the scientific world, certain political and economic decisions were made by the Canadian Red Cross (CRC) and other agencies associated with the blood supply.

Although a convoluted relationship between several regulatory bodies existed, the CRC had the primary responsibility for implementing measures to reduce the risk of transmission in blood. Decisions were made not to use newly-available tests to screen for the HIV and Hepatitis C virus and over the next decade, an estimated 1,200 persons contracted AIDS and more than 12,000 persons contracted Hepatitis C from contaminated blood transfusions. Other decisions not to inform these persons that they had been exposed to contaminated blood, facilitated the spread of the disease further. The scandal was not exposed until the news media began reporting the extent of the tragedy in 1992 and in 1993, the Canadian federal government appointed Justice Horace Krever to head an inquiry on the blood supply.⁶⁴

The inquiry was engaged in controversy from the beginning. The CRC and pharmaceutical firms who contested Krever's right to assign responsibility, prevented the release of his final report

in January, 1996. A year later in January of 1997, after further legal appeals, Krever was granted the right to identify those responsible. But that decision was appealed to the Supreme Court of Canada which upheld the lower court decision, and the report was finally released November 26, 1997—almost two years after its completion. Krever found that although regulatory responsibility was shared among several agencies, that the CRC had the primary responsibility and had refused "to accept and act upon risks to which prudent blood services, elsewhere in the world, were responding The process of implementing HIV-antibody testing was characterized by a failure of all the major actors responsible for the provision of blood services to heed the clear indications of urgency and to react quickly and appropriately."⁶⁵ Krever elaborated on the impact for individual lives and Canadian society in his statements that:

The notification of persons potentially infected with HIV through blood components ought to have been a high priority of the Red Cross, hospitals, and public health officials. Without knowledge of their infection, these persons were denied the opportunity of preventing infection of their sexual partners and of any children who might be conceived. They were also denied the opportunity of seeking treatment. Every infected person unaware of his or her condition could moreover, infect others by donating blood. . . . Despite the clear urgency to inform those persons and to protect others who might be infected through them, the measures that were adopted were neither timely nor effective.⁶⁶

With or without a tainted blood scandal, the onset of AIDS and Hepatitis C irrevocably changed the way blood was used and the way it was perceived by the general public and health care professionals alike. Prior to AIDS, nurses recalled that: "Patients . . . didn't have as much say (as I remember) as they do now."⁶⁷ "I can't recall having permission . . . from the family . . . they just said 'this patient needs blood.' It was a lifesaving device and it was something that the patient it was ordered for, just had to have."⁶⁸ By the mid-1990s, the OCH required that patients be fully informed by their physicians of the risks in receiving a transfusion, that they gave consent, and that they were

provided with written notification of any transfusions received by them at the time of discharge. Nurses were responsible to ensure the notification went home with the patient or family and to document the process on a variety of forms either retained in the chart or returned to the Transfusion Medicine Department.

Nurses sometimes found themselves caught in the middle (between patient and physician) when information and consent were not completed in timely fashion for the transfusion. Patients and families were left with decisions to make regarding the use of blood. In an attempt to avoid legal liability for any transmission of infections through blood products, the hospitals established a process by which patients had to give consent explicitly for blood, acknowledging that the risks had been explained to them. Responsibility for any consequences appeared to be abdicated to patients who often had limited understanding of the statistical risks and explanations given to them. While the option of autologous donation was usually not discussed unless the patient brought the subject up, some patients found an unexpected source of power in their choice to pre-donate their blood--since surgical dates were not postponed or cancelled due to the limited storage life of whole blood. (Patients sometimes made choices about autologous donation based on this information.) Nurses were the front-line care givers to whom patients addressed their questions and whom patients asked for advice--"what would you do?"⁶⁹

Nurses had been socialized through most of the twentieth century to be loyal primarily to the physician and the hospital as employer. Not until the 1970s, did the profession perceive the patient to be the appropriate locus of accountability. In 1973, the International Council of Nurses adopted a revised Code of Ethics which "eschewed the idea of physicians as the focus of nurses' loyalty and named the patient as dominant; the nurse's 'primary responsibility is to those people who require nursing care."⁷⁰ By 1990, accountability to patients and families formed the basis of patient advocacy roles for nurses which the CNO added to the standards of nursing practice: "The RN acts as a client advocate by protecting and promoting the client's rights to access to valid information; informed and voluntary consent to care, treatment, participation in research; . . . [and] participation in decisions affecting his or her care."⁷¹

Alternatives to transfusion and to allogeneic blood

The use of alternatives to blood transfusions presented a second set of complications to nursing care. Limited alternatives were available prior to AIDS, but the research and innovations dramatically increased through the seventies and eighties.⁷² Nurses were involved in the administration and patient teaching related to drug therapies which would increase clotting factors and/or the production of red blood cells (such as aprotinin, erythropoietin, and desmopressin); in critical care areas such as the cardiac surgical unit, they learned to work with cell salvage equipment.

Autologous donation was available in the sixties, but not encouraged by the physicians or the collection agencies who claimed it was more expensive to segregate a donor's blood and ensure that it was given back to her or him when needed.⁷³ It was also asserted that within a safe blood system, patients need not worry about receiving allogeneic blood. Most patients were not informed that they could pre-donate blood as an option. A nurse commented, "I actually was not aware of this type of transfusion until I saw people who came in and [were transfused with] their own blood. . . . but I don't think people were aware that they could give their own blood . . . if they asked, they were told. . . . People are more informed [now] and they ask because they are frightened."⁷⁴ Autologous transfusions also required additional logistics and surveillance: "That's another area of vigilance [for] the patient who. . . was admitted for elective surgery. . . that [it] is well communicated that this person has donated [his own] blood and it's available in the blood bank and that is the only blood that person gets! And there again, you have more pieces of paper and forms in this institution. There is autologous blood information that has to be placed on the chart."⁷⁵

Medical and equipment innovations

The third set of complications arising from blood technology involved equipment changes and new applications of transfusion knowledge. Prior to 1966 for example, certain drugs could be added by nurses to control allergic reactions but after that date, nothing was ever to be added to blood in the transfusion.⁷⁶ Another challenge pertained to various types of infusion lines and pressure systems for blood. A clinical nurse educator in the Emergency Department explained:

You have the Hickman catheters and the portacaths and every time you turn around. . . . I just listened to the PICC [Peripherally Inserted Central venous Catheter] catheter lecture this morning. Hard to keep up to date on everything--everything the patient rolls in these doors with Because we are a critical care area, we can put blood in under pressure--which the nursing units cannot do. So we have the pressure bags here, if we have any problems getting [blood] in. And the other thing is (with physicians here), they will put the central lines in. So I can get a 8.5 French [inserted] and [the blood] just pours in.⁷⁷

As blood warming devices came on the market, so did a variety of tubing specifically designed for each type of machines. Because of the cost of these machines and the dates purchased, a variety of equipment could exist in different areas of the hospital and between hospitals. Patients transported between areas who were receiving blood en route (such as from Emergency to ICU) might not have the correct tubing in place for the next machine:

That's another thing when you are talking about blood --are the tubings right? We have three different choices here. If you are hanging blood with the tubing . . . , as a novice emerg nurse, you think "Holy smoke-- which one do I use when?" And with the level one blood fluid warmer, we need to standardize the equipment in the hospital. So I want everybody in the hospital to purchase the same piece of equipment because it's \$35.00 for that tubing. If they go up to the OR, it's great because the anesthesiologists purchased a level 1 blood fluid warmer. If you go to ICU, they don't have one . . . but they borrow one from the OR. If they go anywhere else in the place, the nurse has to take this [tubing] off and put the regular blood tubing on-- which is really too bad. And we have had patients come in from the outside-- we had a patient with a GI bleed come in from Cornwall . . . and the nurse said, "Oh, I didn't know you had a level 1 here. I had the patient on ours and I took that tubing off because I figured you wouldn't have it here." So that was a waste of \$35.00 that she had and we ended up putting on the exact same tubing that she had just taken off-- which was too bad.⁷⁸

Another recent change involved precautions used with blood for female trauma patients. "What you do is try to reserve the Rh negative blood for the women and not give them [Rh] positive . . . and now, they are talking about having to give them immunoglobulin and stuff and so you have to think about that, you know Anybody who is of child-bearing age is assumed to be pregnant until proven otherwise. So we routinely do a pregnancy test when we get the urine specimens from our trauma patients. So that is something else that you have to think about."⁷⁹

Change strategies

Whenever technologies have been introduced into nursing practice, there have been issues to resolve in adopting roles and responsibilities. As the pace of change increased through this period, different strategies were needed in place of conventional ones where "It was just said that the people had to do it. And I guess it was part of the time--when they were told to do and they did it."⁸⁰ Research and an emphasis on evidence-based nursing practice since the 1980s, helped to shape changes. "I think you have to have the evidence, I mean, I don't believe in telling people anything You have to make sure your direction is sound . . . that you look at it and think about it . . . and show them some of the evidence If you just start something and say it's 'etched in stone' and you are not very open minded, you are in for trouble."⁸¹

Involvement in the decision making process offered one means of protection in which nurses could structure the circumstances in which a procedure was appropriate for them. They could also structure the work conditions to permit knowledge development, modify the procedure, and advocate for workload management when additional responsibilities were accepted. Another strategy included building in alternative support measures for nurses. "One of their concerns was that, 'what if all hell breaks loose now on a really busy shift, with a lot of patients [in the Emergency Department]?' Well then, 'Call the Team to come and help.'"⁸²

An illustration of a parallel technology in which nurses considered the issues and made the decision was the removal of chest tubes on a thoracic unit:

A thoracic surgeon . . . came in one day and said, "Wendy, I want the nurses to start taking out chest tubes." And I said, "Oh . . . and why?" And he said, "Well actually, I think it would be better for the patients and I think they [the nurses] are already there. I said, "Well, I will tell you what. I am not going to say no, but I won't say yes Let me look at it and talk to some people and we will get back to you" So we looked it over. . . and I said, "M-[the nurse manager of the thoracic unit], review it and see what the pros and cons might be and come back to me in 3 months. Work it through with your staff. Nobody is telling anybody to do it--but evaluate it."⁸³

Efficiency and efficacy

Efficiency studies (in the form of time and motion studies) were popular at the turn of the twentieth century, forming a base for claims to scientific credibility in the profession. Efficiency studies (in the form of cost effectiveness studies and costs benefit analyses) remain in the foreground of health care rationalization at the end of the twentieth century. Hospitals have continually questioned the use of nurses' time although the underlying reasons may have shifted periodically from how to meet the shortage in labor supply to how to meet the costs of that labor. As budget accountability was shifted to the unit level through the 1990s and nurses became proactive in 'saving jobs,' they too, took on challenges related to equipment, procedure and personnel costs. "I was specifically looking at ways to try to save time and improve care."⁸⁴

A 1975 hospital report noted that nurses were concerned about the time consuming elements of carrying out procedures, the necessity for more staff, and the learning time for new technologies. Another report on establishing intravenous lines concluded that the procedure was "an expensive use of a nurses' time for a technical procedure."⁸⁵ One problem nurses encountered was that once they took on a responsibility, it usually remained with them indefinitely and often with enlarged parameters to the procedures. As a nurse said, "Originally, we never did venipuncture down here. The physicians did that and over time that skill was given to us . . . then we were the

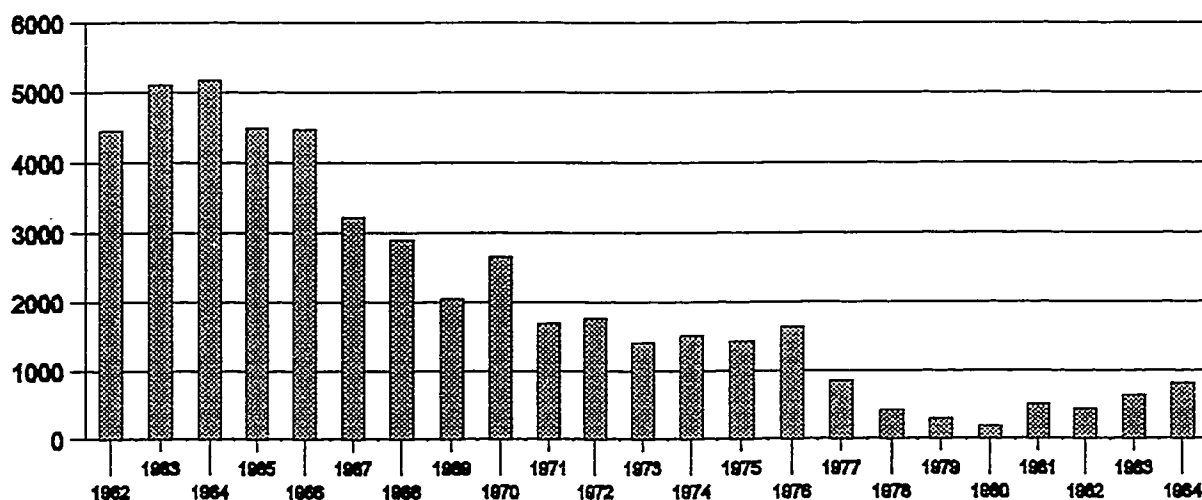
ones having to take the venipuncture for the CBC's [complete blood counts] and 'type and screens' or 'type and cross' or whatever."⁸⁶

Efficiency involved organization around the technology as well: "You've got to get it [blood] in, in four hours, you know . . . and it can't sit there and wait. You had to make sure that IV was running when you got that blood up, and you had to be able to access it immediately. You couldn't be calling for the nurse technician to come and stuff so, I mean I was always looking ahead and organizing."⁸⁷ When asked to consider taking on the responsibility of removing chest tubes, nurses initially responded, "oh my god, we are not taking on something else, we don't have time to do this." To re-frame the issue, one nurse leader suggested, "On the other hand, let's talk a little bit about what the procedure is about and what time you already spend doing it. Are you there when the physician runs the [chest] tube in? . . . They [nurses] looked at the time—from the time the decision was made, to getting the tray ready, and then the tray would be there and they would be ready, but they couldn't find the physician" Their decision was, "We will take it on."⁸⁸

Efficiency held different meanings at different times, in relation to different issues. As nurses in the Emergency Department and critical care areas assumed responsibilities for IVs and transfusions, the work shifted away from the Nurse Technician Team. Similar patterns were noted when intravenous 'add-a-line' systems were introduced later, enabling nurses on general units to assume the management of IV antibiotics. Table 4 illustrates this change as transfusion became a less visible part of nurses' work; the number of transfusions at the OCH declined, but not as dramatically as the decline in the number of transfusions managed by the nurse technician team. The data as reported by the Nurse Technician Team does not reflect the total number of transfusions given in the hospital for these years—but rather, the number of transfusions which they started. As critical care areas and finally, general practice nurses were delegated to carry out the procedure, the Team's statistics fell accordingly. Note also that concurrent practice changes affected the statistics as well: exchange transfusions declined in the late 1960s with the new availability of Rhogam; the OCH Blood Utilization Study was conducted in 1969; and specialty units were taking on

responsibilities for blood through the 1970s. As of 1984, the Team's responsibility was to establish the site with a saline infusion, but the transfusion itself became the responsibility of the staff nurse.

Table 4: Number of Transfusions, Nurse Technician Team Statistics, 1962-1984



Technological confidence

A strong sense of confidence emerged over time, as recapitulated from nurses' stories (though they saw technology from different perspectives). A 1942 graduate reflected: "I think . . . nurses always wanted to do more things and probably they were more anxious to do technical things . . . I never felt that technical proficiency was as good as being a good, all around nurse and taking care of the needs of the patient."⁸⁹ Graduates of 1949 and 1950 commented: "Nurses take on responsibility for anything . . . because there wasn't anybody else to do it,"⁹⁰ and "[Blood] was something beyond the scope of what the nurses could handle--not what they could do, but what they could handle with the workload In the beginning, we were so afraid of the transfusion, that it got all of the observation but as time went on, we realized we had to take care of patient in a holistic way."⁹¹

A 1958 graduate summarized the changes she had experienced: "I am not afraid of the equipment, I am not afraid of IV's, I know what I am doing, I know what I am looking for so it's just

something [managing blood transfusions] that I can do."⁹² Graduating in 1960 and working in both practice and staff education, another nurse attributed the attraction to technological roles with being "In the forefront and doing 'almost doctor things.'"⁹³ After thirty years as a staff nurse, a 1967 graduate noted that technological changes "just came along so gradually," yet "it definitely had a positive effect when you learned something new and became proficient in it." Transfusions became something "we did so automatically that we didn't think about it."⁹⁴ A nurse from the class of 1972 reflected that "Nurses always liked skills and psychomotor tasks. It felt like they were getting into the physician domain. It made it a little bit more challenging for them and a little more interesting and they always wanted to pick up the technology. I can't really think of a time when nurses have said, 'No, I don't want to do that.' It's always been that they have been very eager to take on the psychomotor skills."⁹⁵

A perceptive summary of changes in nursing practice across this time period was offered by a 1970 graduate who had moved from critical care into advanced practice, to leadership and administration: "Nursing is in it's infancy as far as what our research foundation and roots are. What is nursing? I don't think we've figured it out. It used to be psychology and sociology and everything put together. We didn't have a nursing base. And I think it has taken a while to really see what nursing is in it's own right I mean we [the nursing profession] are really young and maybe we are in some ways unreasonable with ourselves."⁹⁶

Work Patterns

Through the 1970s and 1980s, a variety of social changes accompanied the demographic influences of the baby boom generation.⁹⁷ Educational opportunities for both men and women expanded at a rapid rate; the emphasis in education was toward the sciences, partially in response to the Cold War and perceived threats of communism.⁹⁸ Technology and science seemed unlimited in scope and promise. This expansion of the labor force, higher education and increased availability

of technology affected health care systems by the addition of new categories of workers, expanded roles for existing workers and changing work environments in health care.⁹⁹

In contrast to the chronic shortage which existed from the late 1930s through the 1960s, nurses experienced periodic cycles of over supply and shortage since the mid-seventies. Even during times of job scarcity though, nurses with critical care skills (ie. technological skills) were usually still in demand. Through these cycles, they benefited indirectly by being essential to the health care system, which endowed them with a certain amount of power. Nursing power was partially acquired through continual presence at the bedside and through the developing expertise needed by the employer. Nursing power also ebbed and flowed with the advent of allied care providers and the rationalization of services. Relationships in the work environment changed as nurses began to view themselves as partners on the health care team. Confidence based on the integration of knowledge and practice contributed to a growing collegiality with physicians. As one nurse put it, "I have always believed very strongly a lot of strength of nursing is in working with the other professions closely so that you understand each other better . . . you don't ask for respect, you earn it."¹⁰⁰

Power and work

A 1974 journal article argued that prior to the 1970s, nurses experienced little competition as care providers and "had the power that accrues to persons or groups who are essential to the maintenance and functioning of a system."¹⁰¹ Although allied health professions (such as physiotherapists, occupational therapists) were emerging through the first half of the twentieth century, nurses remained the persons constantly present at the bedside.¹⁰² It was this presence which partially situated them for taking on technological roles yet also obscured and minimized what they were doing at the bedside. Nurses were frequently the ones with more familiarity and practical knowledge pertaining to the equipment, procedures, and associated impact for a variety of technologies in use.

In the 1940s, nurses were ready for more and accepted responsibilities because they were obedient when told to expand their role. In the 1950s, nurses claimed an obligation to take on roles because "there wasn't anybody else to do it."¹⁰³ In contrast, during the pendulum years of supply and demand, nurses viewed technological roles as a form of job security—with the idea of remaining 'essential.' A 1970 graduate remarked, "I think if we don't do them, somebody else will do them. And you get all these other roles popping up. We are not doing the patients any favor, by having all these different roles popping up and the nurses are well prepared for a whole gamut of things to do."¹⁰⁴ Other health care workers took on roles previously carried out by nurses, but they were typically absent after-hours, weekends, and holidays. One nurse commented:

Suddenly then we were in vogue again and we could do some of these things on the weekend. Or they would come in and put in the machine and we had to turn it off when they didn't come around to turn it off We were taught to use [intermittent positive pressure breathing machines] and it was taken away from us with the advent of the respiratory technologist They came on the scene and we couldn't do anything except step aside. So we take on a lot of things, then it was taken away because it was felt that other people could do it and then with the downsizing we can now take it on again.¹⁰⁵

Experience and expertise contributed to nursing's power as employees. A Nurse Technician recalled how she was required to quit her position with each pregnancy. But because there were never enough experienced nurses, she was always rehired when she was ready to return to work. Although she lost tenure through the resigning/rehiring cycles, her experience and knowledge provided a measure of power and control over her work life.¹⁰⁶ Other nurses used expertise to gain entry to specific practice areas: "From our floor, many have gone over to the Heart unit and many to ICU. It's quite a critical medical floor and certainly gets lots of opportunity for learning and many did go on to other things."¹⁰⁷ Technological competence was a key to specialty units: "You always

knew that would get you in the critical care areas because critical care areas are about machines and equipment."¹⁰⁸ These nurses who especially enjoyed the challenges of technology, moved into specialty units during the 1970s and 1980s.

Relationships and work patterns

Women growing up in the 1960s and experiencing the early influences of feminism and social activism, brought different expectations to nursing education and nursing practice. In 1960, Dr. Rae Chittick presented an address to directors of Schools of Nursing at the University of Toronto, in which nursing students were characterized in new language: "The gentle, passive, obedient, unquestioning and self-sacrificing woman has given way to a much less saintly model who is more aggressive, assertive, independent and worldly-minded."¹⁰⁹ Relationships between health care providers shifted to reflect wider social changes as well as the growing experience and confidence of nursing practice.

The OCH had a reputation and influence as a teaching and research facility which extended into practice: "We have always kind of been at the forefront here and so we are seen more as leaders than followers." Nurses in the Emergency Department worked with pharmacy to solve issues around the leaching of chemicals from plastic intravenous solution bags. As well, "the nurses have had to look at the charting that they do for fluid resuscitation. And there is a trigger that you use—how many cc's (when you think about blood) . . . so if you are working together with a physician on the trauma team, you have to ensure that you get that blood in, in a timely manner."¹¹⁰

Likewise, when the issue of nurses removing chest tubes arose, nurses were consulted and made the final decision based on their understanding of the technology, balancing workload concerns with the effect on patient care. This was a decision based on practice knowledge, technological confidence, and collegiality. In reflecting on the caring/curing dichotomy, a nurse commented: "I have always believed very strongly in nursing doing things in partnership with the physicians I think slowly there has been a different confidence in leadership. I mean I will stand up to any

physician on an issue in a professional way. Because I think we recognize our own body of knowledge and expertise and we compliment each other and it will result in better care in the end."¹¹¹

This same nurse recalled being at a retreat with senior physicians in 1989, where the hospital organizational structure was discussed. On the original diagram, the position of physician was placed strategically in authority with support people listed below, among which was nursing service. "I stood right up and said, 'Excuse me, . . . nursing is not a support, nursing is in partnership with the physicians.' And after I said it . . . (I still picture it), the Chief of Medicine at that point, stood up and said, 'Wendy, you are 100% right.' And whoever was writing on the board . . . he told him, 'Get nursing up there beside the doctors.'"¹¹²

Summary

Transfusion technology progressed through a period of incorporation following the closure of the School of Nursing in 1973, and the policy decision in 1984 which transferred the procedure into nursing's scope of practice. The development of an associated body of nursing science which integrated both theory and practice facilitated the transfer. As an increasing number of nurses remained in practice, they built a critical mass of experience which allowed for expanded roles and the development of technological confidence to a degree not found in the previous periods under study. The construction of knowledge changed in its focus, from meeting student learning needs to meeting practice nurses' learning needs related to technology and specialization. There were new learners, new content, new roles, and new regulations to shape the way in which knowledge developed.

The process of moving blood transfusion (and technology in general) from a restricted practice to a permitted practice, continued to complicate care giving through new issues related to: disease transmission, alternatives to transfusion, informed consent, new medical applications and equipment developments—each of which had an impact of nursing care. Economic constraints led

to re-examination of medical technology as well as the related nurses' roles. Social influences and nursing ideology shifted nursing practice towards greater accountability to the patient.

Nurses brought a different set of characteristics and expectations to their work environment after the 1970s. Relationships became more collegial as nursing and medicine shared across the technological line and shared in decisions concerning change, particularly in specialty areas. While technological competence and confidence contributed to changed professional relationships, practice nurses felt a lack of recognition for their expertise within their own discipline and a lack of opportunity to use it effectively for the improvement of patient care.

Across this time period, cyclical periods of oversupply and shortage of nurses influenced their work patterns and helped to shape transfusion and technology as a whole. Nurses found a degree of power in being present and essential to the hospital system. Further power came in building expertise, especially related to technologies which the system needed. While nurses were ready to take on roles, they were unwilling to give up roles—in essence securing their employment as multi-skilled workers available twenty-four hours a day.

While blood was rapidly becoming routinized and invisible in the hospital domain, the onset of AIDS and Hepatitis C made it highly visible again in the public domain through the law courts, news media, and personal lives of the victims. The two diseases changed perceptions of blood and the way in which it was managed. As front line care givers, nurses not only shaped the technology but were also shaped by the technology: "It's quite a change to think about feeling bad about having hung something on somebody."¹¹³ "Years ago it was life saving, but I wonder now."¹¹⁴

Endnotes:

1. Gwen Hefferman, interview by author, tape recording, Ottawa, 29 January, 1998.
2. Although these trends were affecting North American society in general, the shape of health care and nurses' work were influenced in specific ways which have been examined in "The Price of Generations': Canadian Nursing Under Medicare, 1968-1990," chapter 7 in Kathryn McPherson, *Bedside Matters: The Transformation of Canadian Nursing, 1900-1990*. Toronto: Oxford University Press, 1996.
3. Hefferman, interview.
4. Rita Maloney, "Technological Issues," in *Canadian Nursing Faces the Future*, 2nd ed. Edited by Alice J. Baumgart and Jenniece Larsen (Toronto: Mosby Year Book, 1992).
5. Jean Milligan, personal communication with the author, April 13, 1998.
6. Hefferman, interview.
7. Kathy Slattery, interview by author, tape recording, Ottawa, 10 February 1998.
8. Report of the Members of the Advisory Nursing Committee, "Re: Medical or Special Procedures," February 3, 1975, contained in loose files of the OCHA.
9. Slattery, interview.
10. Slattery, interview.
11. Hefferman, interview.
12. Helen K. Mussallem, *Royal Commission on Health Services: Nursing Education in Canada*, 1964 (Queen's Printer, 1965): 61.
13. V. V. Murray, *Nursing in Ontario: A Study for the Committee on the Healing Arts* (Toronto: Queen's Printer, 1970).
14. Milligan, interview.
15. Hefferman, interview.
16. A group of five nurses from the OCH went to New York for a seminar on ICUs; later, three nurses attended a three-day cardiology course sponsored by the Massachusetts Heart Association in Boston in 1968, just prior to the establishment of the new Cardiac Unit. COA, OCHSN collection, box 10.
17. Florence Kinsella, interview by author, tape recording, Ottawa, 24 February 1998.
18. Patricia Benner and Judith Wrubel, *The Primacy of Caring: Stress and Coping in Health and Illness* (Don Mills, Ontario: Addison-Wesley Publishing Company, 1989.)

19. Irmajean Bajnok, "Entry-level Educational Preparation for Nursing," in Alice J. Baumgart and Jenniece Larsen (Eds.) *Canadian Nursing Faces the Future 2nd ed.* (Toronto: Mosby Year Book, 1992).

20. In 1962, only three nurses in Canada had earned doctorate degrees according to Helen K. Mussallem, *Royal Commission on Health Services: . . .*, 78. And as of 1992, only 1% of nurses had completed either a Masters or Doctorate degree. Fuller discussion of nursing education in Canada is presented by Peggy Anne Field, Shirley M. Stinson, and Marie-France Thibaudeau, "Graduate Education in Nursing in Canada," in Alice J. Baumgart and Jenniece Larsen (Eds.) *Canadian Nursing Faces the Future 2nd ed.* (Toronto: Mosby Year Book, 1992). In the same volume, there is a profile of the work force which includes educational preparation as well: Alice J. Baumgart and Mary M. Wheeler, "The Nursing Work Force in Canada."

21. Excellent analyses are available in works by Julie Fairman, "New Hospitals, New Nurses, New Spaces: The Development of Intensive Care Units, 1950-1965," unpublished Ph.D. dissertation, University of Pennsylvania, 1992 and "Watchful Vigilance: Nursing Care, Technology, and the Development of Intensive Care Units," *Nursing Research* 41, no. 1 (1992): 56-60. For understanding the emergence of one specialty practice at the OCH, initial work was begun in Cynthia Toman and Evelyn Kerr, "Incomprehensible Yesterday, Routine Tomorrow: The Emergence of Cardiovascular Nursing as a Specialty at the Ottawa Civic Hospital, 1960-1975," unpublished manuscript.

22. Donna Zschoche and Lillian E. Brown, "Intensive Care Nursing: Specialism, Junior Doctoring, or Just Nursing?" *American Journal of Nursing* (November, 1969): 2373.

23. Patricia Crossley, interview by author, tape recording, Ottawa, 26 January 1998.

24. Crossley, interview.

25. Kinsella, interview.

26. Hefferman, interview.

27. Slattery, interview.

28. College of Nurses of Ontario, "Standards of Nursing Practice for Registered Nurses and Registered Nursing Assistants," Toronto, 1976.

29. Refer to the parallel documents: College of Nurses of Ontario, "Standards of Nursing Practice for Registered Nurses and Registered Nursing Assistants," (Toronto, 1990) and "Guidelines for Decisionmaking About Added Nursing Skills and Sanctioned Medical Acts," (Toronto, 1990).

30. College of Nurses of Ontario, "Standards of Nursing Practice for Registered Nurses and Registered Nursing Assistants," (Toronto, 1990): 7.

31. "The Regulated Health Profession Act and its Impact: An Interview with the College of Nurses of Ontario," *Registered Nurse* (December/January, 1993/1994): 11.

32. College of Nurses of Ontario, "Scope of Practice and Controlled Acts Model," *College Communiqué* 19, no. 1 (March, 1994): 9.

33. Katherine B. Nuckolls, "Who Decides What the Nurse Can Do?" *Nursing Outlook* 22, no. 10 (October, 1974): 626.

34. Henderson inserted her opinion into her widely-used nursing textbook: Bertha Harmer and Virginia Henderson, *Textbook of the Principles and Practice of Nursing* 5th ed. (New York: The Macmillan Company, 1955): 740.

35. Crossley, interview.

36. Hefferman, interview.

37. Crossley, interview.

38. Refer to foundational work by Barbara Melosh, *"The Physician's Hand": Work, Culture and Conflict in American Nursing* (Philadelphia: Temple University Press, 1982).

39. Slattery, interview.

40. V. V. Murray, *Nursing in Ontario . . .*, 12.

41. Dr. Wilbert Keon, interview with Evelyn Kerr and Cynthia Toman, Ottawa, March 14, 1995, cited in an unpublished manuscript: Cynthia Toman and Evelyn Kerr, "Incomprehensible Yesterday, Routine Tomorrow"

42. Crossley, interview.

43. Crossley, interview.

44. Crossley, interview.

45. Wendy McKnight Nicklin, interview by author, tape recording, Ottawa, 21 April 1998.

46. Crossley, interview.

47. Julie Fairman, "Alternate Visions: The Nurse-Technology Relationship in the Context of the History of Technology," *Nursing History Review* 6 (1998): 139.

48. Nicklin, interview.

49. Nicklin, interview.

50. Slattery, interview.

51. Rosemary Coombs held a Masters degree in Nursing and was hired to give leadership to the newly established Cardiac Unit in 1968. According to her biography, Coombs became the first Canadian Clinical Nurse Specialist in cardiovascular and thoracic nursing at Kingston General Hospital, after graduation from the University of Washington and teaching in New Brunswick. "Rosemary Coombs," *RNAO* 35, no. 1 (January/February, 1979): 12. The second person was Wendy Nicklin, clinical nurse specialist for the Emergency Department from 1978-1980.

52. Nicklin, interview.
53. Personal communication by email with Wendy Nicklin, May 4, 1998.
54. Nicklin interview.,
55. Nuckolls, *Who Decides . . . ?*
56. Murray, *Nursing in Ontario . . .*, 38.
57. V. V. Murray, *Nursing in Ontario: . . .*, 33. Similar opinions were expressed at the OCH in a report issued by the members of the Advisory Nursing Committee (almost entirely made up of physicians), 3 February 1975, p. 2. "Re: Medical or Special Procedures," contained in a notebook of Sanctioned Medical Procedures, OCHA.
58. Report of the Members of the Advisory Nursing Committee, "Re: Medical or Special Procedures," February 3, 1975, contained in loose files of the OCHA.
59. Nicklin, interview.
60. Nicklin, interview.
61. Slattery, interview.
62. Slattery, interview.
63. Each of the eight nurses interviewed, commented on the nature of blood and the related procedures—that it was treated differently, with a precision and routinization not found in other procedures. Usually, with increased familiarity of the boundaries for safety in particular technical procedures, nurses developed variations and preferences for ways of working.
64. A wide variety of material has been written on the Canadian blood scandal. For more detailed description and individual anecdotes of some of the victims, refer to André Picard, *The Gift of Death: Confronting Canada's Tainted Blood Tragedy* (Toronto: HarperCollins Publishers Ltd., 1995). Picard is a journalist who attended the inquiry hearings, took notes, and interviewed victims of the diseases.
65. Justice Horace Krever, *The Report of the Commission of Inquiry on the Blood System in Canada*, Vol. I, Part III (Ottawa: Public Works and Government Services Canada, 1997): 330.
66. Krever, *The Report of the Commission of Inquiry . . .*: 364.
67. Kinsella, interview.
68. Margaret Henricks, interview by author, tape recording, Ottawa, 2 February 1998.
69. Personal experiences of the author.
70. Joan E. Lynaugh, "From Chaos to Transformation" in The International Nursing History Collective, Barbara L. Brush and Joan E. Lynaugh, eds., *Internationalizing Nursing: A History of the International Council of Nurses, 1899-1999*, Chapter 4. In press.

71. College of Nurses of Ontario, "Standards of Nursing Practice for Registered Nurses and Registered Nursing Assistants" (Toronto, 1990):19.

72. Refer to endnote # 8 in chapter one, for analysis from the International Study for Perioperative Transfusion (ISPOT). This research study investigated the development and use of the alternatives: autologous transfusions, cell savers, aprotinin, erythropoietin, desmopressin (DDAVP), and hemodilution.

73. This practice was confirmed by Jean-Yves Dupuis, "An Analysis of Transfusion Decision Making in Cardiac Surgery: Comparing Patients Who Predonated Autologous Blood to Matched Controls," Presentation at Loeb Research Institute, Ottawa: 21 February 1997 and by T. Gwynford Jones, retired head of OCH Transfusion Medicine, personal communication with author, 12 April 1998.

74. Crossley, interview.

75. Hefferman, interview.

76. "Memorandum to Head Nurses Re: Addition of Drugs to Whole Blood," 26 April 1966, from B. Jean Milligan (Assistant Director, OCH), Assistant Nursing Arts Instructor Manual, OCHA.

77. Slattery, interview.

78. Slattery, interview.

79. Slattery, interview.

80. Henricks, interview.

81. Nicklin, interview.

82. Nicklin, interview.

83. Nicklin, interview.

84. Nicklin, interview.

85. Memo from the Advisory Nursing Committee, 3 February 1975; memo to the Advisory Nursing Committee regarding "Venapuncture and Establishing Intravenous Lines," 1 March 1976; both from OCHA.

86. Slattery, interview.

87. Slattery, interview.

88. Nicklin, interview.

89. Milligan, interview.

90. Isabel Simister, interview by author, tape recording, Ottawa, 22 January 1998.

91. Henricks, interview.
92. Crossley, interview.
93. Hefferman, interview.
94. Kinsella, interview.
95. Slattery, interview.
96. Nicklin, interview.
97. Ibid., pp. 309-312.
98. For a more comprehensive, political analysis of the 1960s, see chapter 22, "From the Old Ways to the New: The Changing Atmosphere of the Early Sixties," in Robert Bothwell, Ian Drummond, and John English, *Canada Since 1945: Power, Politics, and Provincialism*, rev. ed. (Toronto: University of Toronto Press, 1996).
99. Susan Rimby Leighow, *Nurses' Questions/Women's Questions: The Impact of the Demographic Revolution and Feminism on United States Working Women, 1946-1986* (New York: Peter Lang, 1996). See also, Joan E. Lynaugh and Claire M. Fagin, "Nursing Comes of Age," *Image: Journal of Nursing Scholarship* 20, no. 4, (1988): 184-190.
100. Nicklin, interview.
101. Knuckolls, "Who Decides What the Nurse Can Do?" 627.
102. For an analysis of the emergence of physiotherapy in Canada, see Ruby Heap, "Training Women for a New 'Women's Profession': Physiotherapy Education at the University of Toronto, 1917-1940," *History of Education Quarterly* 35, no. 2 (Summer, 1995): 135-158. An overview of the history of occupational therapy is found in Charles Christiansen, "Occupational Therapy: Intervention for Life Performance," in Charles Christiansen and Carolyn Baum (Eds.), *Occupational Therapy: Overcoming Human Performance Deficits* (St. Louis: Slack Incorporated, 1991).
103. Simister, interview.
104. Nicklin, interview.
105. Crossley, interview.
106. Donna Martin, personal communication, April 1, 1998.
107. Kinsella, interview.
108. Slattery, interview.
109. Dr. Rae Chittick, "The Changing Field of Nursing," unpublished paper presented for the Conference for Directors, Schools of Nursing, University of Toronto, School of Nursing and Department of University Extension, 8-10 February 1960; OCHA.

110. Slattery, interview.

111. Nicklin, interview.

112. Nicklin, interview.

113. Slattery, interview.

114. Crossley, interview.

Chapter 6

CONCLUSION: CROSSING THE TECHNOLOGICAL LINE

Technology intersects the hypothetical line which distinguishes medicine and nursing, cure and care, and the science and art of health care. Rather than fitting neatly into these dichotomous domains, technology bridges them. Nurses and physicians meet at the technological line where practice becomes shared, and art and science become integrated. As a medical technology, transfusion has always been contingent on the state of medical knowledge and its applications. But nurses have participated in this technology, with increased involvement and responsibility, from the time it was introduced in patient care settings. Transfusion crossed the technological boundary between medicine and nursing through the process of delegation.

The North American nursing profession struggled through most of the twentieth century with issues surrounding medicine and technology in the search for a unique identity. The dualism which developed between nursing knowledge and nursing practice became pervasive and divisive within the profession; it impeded the achievement of autonomy and the development of a distinct body of knowledge capable of incorporating both the theoretical and technological aspects of caring. As nursing leadership moved further away from the practice setting, many lost a sense of connectedness to practice. Efforts to dissociate the two aspects impeded professional development by leaving much of nursing practice outside of dominant 'caring' frameworks.¹ This dissociation between practice and science became evident as well, in the discontinuity between practice and

research. As one nurse administrator pointed out, "Nursing is in its infancy as far as what our research foundation and roots are."²

While the leadership debated what nursing was, practice nurses continued caring for patients and families, dealing with the technology as it arrived. Nurses experienced little competition as care providers, and learned to use the power associated with being essential to the maintenance and functioning of the system. They remained the persons constantly present at the bedside, and it was this presence which partially situated them for taking on technological roles, yet also obscured and minimized what they were doing at the bedside. As Fairman pointed out, "By the way they organized their work, their consent to go beyond the boundaries of nursing practice of the time, or simply their decision to use their clinical judgement when the rationality of physicians' orders was in question, nurses made choices about technology that deeply influenced patient care."³ Benner and Wrubel maintained that, "When the situation calls for technical proficiency, then technical proficiency . . . is experienced as caring."⁴

Synopsis of the Three Time Periods

Based on the manner in which nurses were involved with the technology, transfusion can be divided into three time periods: a period of introduction, a period of delegation, and a period of incorporation. Across these three time periods, technology shaped and was shaped by nurses as they constructed new knowledge related to it, as they dealt with the manner in which it complicated patient care activities and the work environment, and as changes in their work patterns facilitated the transfer of the technology into their domain.

During the period of introduction from 1924 to 1947, transfusion was administered mainly by physicians (who were often interns) with the assistance of nurses. Nursing roles involved preparing the equipment and the patient, assisting during the procedures, and cleaning up after the procedures. The categorization of these roles are simplistic, however, because there was a great deal of complexity involved in the management of two patients (a donor and a recipient) through

surgical procedures which were initially performed in the operating room. Student nurses as primary care givers on the ward, were limited by their novice status in their understanding of technology and the performance of skills. For them, the technological line was sharply drawn due to these knowledge and experiential constraints.

During the period of delegation from 1947 to 1970 at the Ottawa Civic Hospital (OCH), transfusions were the responsibility of the Blood Team which began with two graduate nurses and expanded to include a small, core group of experienced nurses with added functions. The Blood Team could be viewed as an early nursing specialty practice, in which expertise was recognized and levels of practice were subsequently differentiated. This group of graduate nurses began to build an experiential knowledge base related to a variety of technologies, such as intravenous therapy, intravenous antibiotics, chemotherapy medications, and parenteral feeding systems.

Through the 1950s and 1960s, the Blood Team assumed still newer technologies with a resulting shift in the assessment and monitoring for transfusions to the bedside nurse, who was still likely to be a senior student. While transfusion was no longer a surgical procedure, it commanded a great deal of vigilance and respect because of its unpredictability and the limited range of interventions which nurses were permitted to use. As a 1967 nurse summarized it, "Making sure the patient got it--that was our responsibility."⁵ The widespread use of blood during these years,⁶ provided opportunity for nurses to become familiar and comfortable at the equipment and the procedural levels, as the technological line began to blur.

The third period from 1970 to 1990, was characterized by incorporation, as transfusion technology became rooted in the practice of nursing and established as a basic competency for practice. Several conditions made this possible: the student labor force had been replaced by graduate staff nurses when the hospital closed its school of nursing; nurses had built a greater level of experience and technological confidence; and technologies were proliferating at a rate beyond which a small core of designated nurses could manage it. Transfusion came to be included within nursing's scope of practice, with the exception of the diagnostic and prescriptive components. As

one nurse said, "We had grown up respecting blood and what it could do and knowing that we have to be so careful with our surveillance."⁷

In 1991, interest was expressed in establishing a Home Transfusion Program, following the mandate of the provincial government for the delivery of care in the community sector wherever possible. Following the example of a small community east of Ottawa, a proposal was put forward by the Chief of Haematology, suggesting that "the work that would be involved is the coordination of transportation of the blood, starting the intravenous, and home monitoring of the transfusion by Nursing. This could be done by the VON [Victorian Order of Nurses] but it might be interesting to look at it . . . with nurses from our own IV Team."⁸ The proposal required that a patient be assessed by the physician as appropriate for home transfusion and following acceptance to the program, nurses would then be responsible for the rest of the decisions and management. The technology would become even less visible (happening in the patient's home) and nurses would once again, 'take on more.'

If blood was becoming routine and 'invisible' (or part of daily practice) within the hospital, it was certainly highly visible outside the hospital setting--with the onset of new issues related to Acquired Immunodeficiency Syndrome (AIDS) and Hepatitis C in the 1980s. Both health professionals and the general public developed heightened awareness and suspicion toward blood as an infectious agent. New precautions and procedures were implemented to reduce the risks of exposure; where risks could not be reduced, liability was transferred to the patient by way of informed consent processes. By 1990, the concerns related to blood were so great, that both medicine and nursing turned the attention to alternatives such as 'bloodless surgical techniques,' autologous donations, and alternatives to blood products.⁹

Summary of the Analysis

This study of blood transfusion and nursing builds on foundational work by Susan Reverby who examined the relationship between nurses and science in the 1920s,¹⁰ Kathryn McPherson who

"explor[ed] the workplace practice of ordinary nurses and the influence that scientific theory and scientific management had on their daily lives,"¹¹ and Julie Fairman who suggested that "although physicians are legally responsible for ordering its [technology's] application, nurses have enormous power and choice in how and whether the system works and application is continued."¹² I initially took up McPherson's challenge to examine what nurses were doing at the bedside, through the examination of one specific technology. The oral history interviews revealed three emerging themes (the construction of knowledge, the complications of technology, and changing work patterns) which evolved over the time periods associated with the introduction, delegation, and incorporation of blood transfusions into nursing practice.

Construction of knowledge

Reliance on students as the main care providers greatly impeded the development of the knowledge: practice knowledge and nursing science were kept at a beginning level of understanding, with the exception of small numbers of graduate nurses who found employment in the hospital primarily as head nurses and supervisors. Students may have mastered the equipment and procedures, but were not equipped to engage in research or knowledge development.

During the period of introduction, there was a noticeable trend for lectures to be given at the cellular level, practice to be supervised at the procedural level, and the majority of student time to be spent at the service level. Their practice centered on the equipment and assisting the physician. During delegation, knowledge increasingly developed around procedures and safety issues. Students and nurses relied on the presence of an expert Blood Team/Nurse Technician Team to manage transfusions, while their role continued to be one of preparing, assisting, and cleaning up. Technology had co-opted the focus of attention for the predominantly student work force during these first two periods. By the end of this period, however, more emphasis was placed on 'knowing the principles' as nurses began to take over much of the Blood Team's former roles. During the period of incorporation, new learners and new learning needs influenced the construction of knowledge for

nurses. It was not until the third period during which the proportion of graduate staff increased, that nurses engaged in continuous practice long enough to gain the expertise and technological confidence to take on expanded roles.

This finding is consistent with more recent qualitative research on the development of expertise. According to Patricia Benner, expertise is context-specific and cannot be attained through theory alone.¹³ It builds sequentially from novice levels and is based on experience, gained over time, often without the clinician's awareness. "Expertise in complex human decision making, such as nursing requires, makes the interpretation of clinical situations possible, and the knowledge embedded in this clinical expertise is central to the advancement of nursing practice and the development of nursing science."¹⁴

There was a continuum of technological knowing, along which nurses engaged a particular technology on any one of at least three levels: the level of managing the equipment, the level of skillfully performing the procedure (knowing the steps and sequences, combined with psychomotor dexterity), and the level of integration. Progress along the continuum was and is not necessarily, linear. Art and science, knowing and doing, were not dichotomous activities for experienced practice nurses. Interestingly, Julie Fairman has recently described a phenomenon she calls "clinical thinking" related to the development of nursing knowledge by Nurse Practitioners.¹⁵ Clinical thinking bears some resemblance to this integrated way of knowing and doing which I have described with medical technology.

The concept of a continuum became more apparent in the interviews which spanned fifty-five years of nursing practice at the same hospital. In recalling early blood transfusions, one nurse commented that, "You were so absorbed in that needle in the beginning, that you didn't take the whole thing in. As time went on, we realized we had to take care of patient in a holistic way."¹⁶ By comparison, nurses from the middle period described learning 'tricks of the trade' associated with blood, following the steps, and watching it closely because it was very unpredictable.¹⁷ For nurses in the third period, blood issues were taken on collaboratively with the health care team in problem

solving approaches. "The other problem that we have, is that we are not giving our blood really warm enough in trauma resuscitation . . . we have recognized that Nurses have had to look at the charting that they do for fluid resuscitation . . . the trigger that you use--how many cc's . . . So if you are working together with a physician on the trauma team, you have to ensure that you get that blood in, in a timely manner."¹⁸ As well, the integration of 'knowing and doing' was essential for building technological confidence and enabling nurses to assume the role of patient advocate related to technological decisions and care. It was also essential for participation in problem-solving related to patient care issues.

Technology complicates things

Hospitals faced a dilemma: how to provide for the increased demands for medical and nursing care, during a time of increasing technologies which were beyond the novice capability of a student work force and an inadequate supply of graduate nurses? The introduction of blood to civilian populations brought labor-intensive changes to nurses' work requirements. Procedures were complicated and preparations were extensive. Although reminiscent of nursing's domestic roots, the roles were essential during a time prior to antibiotics and characterized by limited understanding of blood uses and patient reactions to it.

With the advent of the Blood Team and the process of delegation, transfusion began to shift into nursing practice on a limited basis. It complicated care through the need to organize around the procedure, to maintain the volume and flow once transfusion was initiated, the limited interventions which nurses could use, and the hierarchy of relationships which emerged related to delegation. After the technology became incorporated into general nursing practice, it complicated care through new issues around infection and infection control, alternatives to transfusions, patient information and consent, and innovations such as technology for warming blood and infusing it under pressure.

Work patterns

Initially, social expectations for married women, war time opportunities for nurses, and nurses' own dissatisfaction with working conditions contributed to a chronic shortage of nurses which lasted into the 1970s. This nursing shortage and the reliance on students as care givers, limited the type of roles and responsibilities which nurses could assume related to technology and to transfusion. The delegation of blood to a special team of nurses began to differentiate between practitioners, bringing a measure of power and enhanced status initially. As more technologies emerged and hospital services expanded, a critical need developed for experienced nurses and continuing education. Nurses found a degree of power in being present and essential to the hospital system. Further power came in building expertise, especially related to technological knowledge which the system needed. While nurses were ready to take on expanded roles, they were unwilling to give up other roles—in essence securing their employment as multi-skilled workers available twenty-four hours a day.

The cycles in supply and demand for nurses were socially constructed, having little to do with the patients' needs for nursing care and having everything to do with the development of expertise. As long as there was a school of nursing, the hospital was able to respond to the chronic shortage of nurses by increasing class enrollments. Hospitals could expand programs, construct new wards, and add technologies confident in their ability to access the student work force and to have a built-in training mechanism. They were also confident in the newly-funded, universal, insurance programs and the post-war, economic expansion. Specialty units and technology were highly visible parts of the expansion and nurses with experience could negotiate working conditions.

With closure of the school, the OCH had to deal with the costs of an all graduate nurse staff and the loss of ability to easily respond to the labor demands through students. Economic recessions came and went. Technologies consumed larger and larger proportions of the health care budget as did nurses' salaries. With the 1990s, came health care rationalization and restructuring—and a reduction in nursing jobs. Health care needs did not change, but the ability to

pay for them did. By 1997, nursing shortages appear on the horizon again. In these cycles of rationalization, there is a dangerous loss of nursing expertise which will not be as easily replaced in the future as it was in the past.

Through the cycles, nurses have used their continual bedside presence to take on additional technological roles as a job security measure. Rather than providing security, this study suggests that when nurses take on a technology, it moves from visibility to invisibility and is subsumed into the workload. At that point, it risks being considered as a task instead of gaining recognition as knowledge work. Tasks can then be performed by the lowest cost provider, but without the protection and safety inherent in its associated knowledge. Sandelowski asserted that "depicting nursing as exemplifying 'feminine' caring in opposition to 'masculine' technology. . . inadvertently minimize[s] or den[ies] nursing its record of expertise and innovation with technology. . . and the power and remuneration that comes with technological knowledge and skills."¹⁹

Future Directions for Research

Lack of historical research in nursing has handicapped the development of the profession. It is difficult to articulate who we are and what is our contribution to health care, without an awareness of how relationships have been structured in the past, what solutions were attempted with what outcomes, and what contextual factors influenced care. In building on the previous research of Reverby, McPherson, and Fairman, this study has elaborated on how nurses have used science in a specific hospital setting, with a specific technology.

Future research should compare other hospital settings: Was transfusion delegated in the same or similar manner in other comparable hospitals? Was there a difference in the manner or the rate of delegation between large, urban hospitals and smaller, rural hospitals? Was there a geographical difference in the transfer of technology to nurses (for example, eastern versus western Canada)? Was there a cultural difference in the transfer of technology (for example, between francophone and anglophone populations)? What role did the evolving health insurance plans have

on the transfer of technology and/or blood transfusion? Why was the medical profession ready to transfer specific technology to nurses? Did other technologies follow the same process for transfer, and why or why not? Was the Canadian approach in delegation to nurses similar or dissimilar to the American practice?

Relevance for Practice

Through historical analysis of one medical technology and its incorporation into nursing practice, I have argued that nurses shaped technology through the addition of knowledge and skills with the equipment, the procedures and their experience with holistic assessment skills, supportive care activities, teaching and patient/family advocacy roles. They also shaped technology by their work patterns, which provided a critical mass of experienced nurses capable of accepting delegation from physicians. In addition, nurses have been shaped by technology as it complicated patient care, patient and professional relationships, and work load.

Examination of bedside practice has contributed to the understanding of social forces which influence current trends and issues in nursing practice. As one result of health care restructuring, policy makers have questioned who are the most cost-effective, care providers for specific technologies and secondarily, who are the most appropriate providers in a given situation? Decisions need to consider the value, safety and cost-effectiveness of expert providers who are able to: integrate the technology with the knowledge; function autonomously and accountably; participate in clinical decision making; problem solve care issues; and deliver supportive care across the health care continuum. Advanced practice nurses are well-prepared to articulate this knowledge base and to participate in shaping technology appropriately for the patient and family. Regardless of the practice setting, nurses are appropriate participants in issues surrounding ethical decision making, costs benefit analysis, and quality of life in the use of specific technologies.

This historical research has been instrumental in partially uncovering what nurses do at the bedside—including the construction of nursing knowledge around one technology. The absence of a

nursing perspective contributed to a one-sided understanding of blood transfusion: how it was shaped, how it was resisted, and how it complicated care. Transfusion exemplified other medical technologies in the way it was introduced into health care settings, and in the manner in which it was delegated to nurses. It has provided insight into nursing practice as an integrated art and science.

The study has also partially illuminated nurses' value and contribution to the wider health care system during times of economic strain, such as the shortage of health care providers over much of the twentieth century which once again threatens the North American system. Nursing remains a predominantly female profession; the study of nursing and technology has revealed some of the gendered ways in which knowledge was controlled and shaped, as well as ways in which both professional image and work relationships were, and continue to be structured. By documenting the experiences of bedside nurses, this study has contributed to the history of women and women's work, as they dealt with the hospital practice setting. Women found ways of resisting, ways of using power, and ways of influencing change within the health hierarchy.

Endnotes

1. Many discussions exist in the professional literature (especially during the 1960s-1980s) regarding a two-tier system of practice and education in which there would be technical and professional nurses. One example is Mildred L. Montag, "Technical Education in Nursing?" *American Journal of Nursing* 63, no. 5 (May, 1963): 100-103.
2. Wendy McKnight Nicklin, interview by author, tape recording, Ottawa, 21 April 1998.
3. Julie Fairman, "Alternate Visions: The Nurse-Technology Relationship in the Context of the History of Technology," *Nursing History Review* 6 (1998): 142-143.
4. Patricia Benner and Judith Wrubel, *The Primacy of Caring: Stress and Coping in Health and Illness* (Don Mills, Ontario: Addison-Wesley Publishing Company, 1989): 5-6.
5. Florence Kinsella, interview by author, tape recording, Ottawa, 24 February 1998.
6. Elizabeth Fenton, Retired Blood Bank Technologist, personal communication with author, 22 May 1998. Miss Fenton described "two explosions in blood use," one at the onset when the Blood Bank opened in 1939 and the second when cardiac surgery with the use of the heart and lung bypass machines began, in 1968 at the OCH. Cardiac surgery used massive amounts of blood at the beginning, sometimes up to 20 units for one procedure. In her words, she arrived in the blood bank for one-half-day and ended up staying 47 years.
7. Kathy Slattery, interview by author, tape recording, Ottawa, 10 February 1998.
8. Letter from Dr. J. Bormanis (Chief of Haematology) to Dr. Jennifer Jackman (Vice-President Medical Affairs, OCH), April 16, 1991, from the files of the Nurse Technician Team Manager, OCH..
9. "Blood Transfusion Alternatives: What You Should Know." Monograph, series EPXSUR-9637. North York, Ontario: Ortho Biotech, n.d.; "Bloodless Surgery," Joan Leishman, interviewer. Canadian Broadcast Corporation's "Sunday Morning" program. Toronto: 17 November, 1996; and Dupuis, Jean-Yves. "An Analysis of Transfusion Decision Making in Cardiac Surgery: Comparing Patients Who Predonated Autologous Blood to Matched Controls." Presentation at Loeb Research Institute, Ottawa, 21 February, 1997.
10. Susan M. Reverby, *Ordered to Care: The Dilemma of American Nursing, 1850-1945* (New York: Cambridge University Press, 1987) and "A Legitimate Relationship: Nursing, Hospitals, and Science in the Twentieth Century," in *The American General Hospital: Communities and Social Contexts*, edited by Diana Elizabeth Long and Janet Golden (Ithaca: Cornell University Press, 1989).
11. Kathryn McPherson, "Science and Technique: Nurses' Work in a Canadian Hospital, 1920-1939," in *Caring and Curing: Historical Perspectives on Women and Healing in Canada*, edited by Dianne Dodd and Deborah Gorham (Ottawa: University of Ottawa Press, 1994):73.
12. Julie Fairman, "Alternate Visions: The Nurse-Technology Relationship in the Context of the History of Technology," *Nursing History Review* 6 (1998): 137.

13. Patricia Benner, *From Novice to Expert: Excellence and Power in Clinical Nursing Practice* (Don Mills: Addison-Wesley Publishing Company, 1984). In a co-authored, second book (Patricia Benner and Judith Wrubel, *The Primacy of Caring: . . .*), the authors continue to elaborate on practice knowledge. They suggest that "practical engaged activity is more basic than, and is prior to, reflective theoretical thinking" (p. 20) and discuss skilled activity as "embodied intelligence" (p. 42-43).

14. Benner, *From Novice to Expert...*, 3.

15. Julie Fairman, "Delegated by Default?: Analyzing Medical Technology Transfer From Physicians to Nurses, The Case of Physical Diagnosis, 1960-1975," paper presented at the American Association for the History of Medicine, Toronto, 6-8 May 1998, cited with permission of author.

16. Margaret Henricks, interview by author, tape recording, Ottawa, 2 February 1998.

17. Patricia Crossley, interview by author, tape recording, Ottawa, 26 January 1998.

18. Kathy Slattery, interview by author, tape recording, Ottawa, 10 February 1998.

19. Margarete Sandelowski, "Ir)Reconcilable Differences? The Debate Concerning Nursing and Technology." *Image: Journal of Nursing Scholarship* 29, no. 2, (1997): 172.



Université d'Ottawa - University of Ottawa

Faculté des sciences de la santé
Cabinet de la doyenne

Faculty of Health Sciences
Office of the Dean

CERTIFICATION INSTITUTIONNELLE DU COMITÉ DE DÉONTOLOGIE DE LA RECHERCHE SUR LES ÊTRES HUMAINS FACULTÉ DES SCIENCES DE LA SANTÉ

Le Comité de déontologie de la recherche sur les êtres humains de la Faculté des sciences de la santé, mandaté à cette fin par l'Université d'Ottawa certifie avoir étudié le projet soumis par **Professeure Meryn Stuart et Madame Cynthia Toman de l'École des sciences infirmières** pour le projet intitulé « *Nurses' relationship to blood transfusion technology in Canada, 1940-1990* ». Le comité confirme que ce projet répond entièrement aux normes déontologiques à un niveau de **catégorie 1A**.

COMPOSITION DU COMITÉ

<u>Nom (Optionnel)</u>	<u>Poste occupé</u>	<u>Département ou discipline</u>
Victor Boucher	Professeur	Programme d'audiologie et d'orthophonie
François Tremblay	Professeur	Programme de physiothérapie
Claire-Jehanne Dubouloz	Professeure	Programme d'ergothérapie
Mark Grenier	Étudiant	École des sciences de l'activité physique
Jocelyne Tourigny	Professeure	École des sciences infirmières
Julian Roberts	Professeur	Département de criminologie
Roch Paquin	Membre affilié	
J. Roger Proulx	Président	Comité de déontologie

SIGNATURE

16/10/97

Date

Président du comité de déontologie- **J. Roger Proulx, Ph.D.**

Appendix B: Letter for Participants

October 1, 1997

Subject: Historical research project on blood transfusions in Canada, 1940-1980

This research project has been designed in partial fulfilment of the requirements for the Master of Science in Nursing degree, at the University of Ottawa. It involves the use of historical methodology to research a topic of significance to nursing.

Cynthia Toman is investigating the process by which nurses assumed roles and responsibilities for using blood transfusion technology during the initial years of its use in civilian populations. You are invited to participate in the study as a nurse who was associated with the Ottawa Civic Hospital during this period of study. Sharing your experiences will assist in understanding how blood transfusion has developed over the years since 1940. Although you will be asked to reveal your name and personal information as you recall experiences from your practice, you will have the opportunity to specifically choose and consent to the use of your information either as attributed to you in quotations or in anonymity. There is a remote possibility that information of a sensitive nature may be involved since one aspect of the study involves nurses' roles in blood transfusions.

Interviews will be recorded on audiotape and transcribed for the purpose of analysis. The interviews will be limited to one hour in length and conducted by Cynthia. A second or third interview may be recorded for the purpose of clarifying information. Should you prefer not to be taped, Cynthia will take notes during the interviews, for later analysis.

There are potential benefits and risks to you by participating in this study. Potential benefits are the opportunity to share from your lived experiences about the early uses of blood products in Canada and opportunity to contribute to historical knowledge. Risks may include fatigue during the interview and/or uncomfortable memories you may recall. Opportunity for rest during the session will be provided, if required. You may choose the place, length, frequency, and time of the interviews. During the interviews, if you recall experiences which are emotional or associated with strong feelings, you may stop the interview, change the subject matter, or have any sensitive material removed from the tapes or notes.

Participation is voluntary. You may withdraw at any time from the study. You may review any tapes, transcripts, or notes of the interviews and delete material that you do not wish revealed without any penalty for non-participation. The tapes, transcriptions, and notes will be retained in secured files by Cynthia for one year following the completion of the project and then destroyed. Papers will be written and presentations given based on the findings of the research. You may choose to be quoted in material presented from this study or you may specifically state on the consent form that you do not wish to be quoted. In that case, identifying material will be omitted and your information will be used anonymously.

Thank you for considering participation in this research. Your contributions are valuable and appreciated by the researcher. You may contact Cynthia or Dr. Stuart with questions about the study at the phone numbers given below. You may consult Dr. Roger Proulx only in regard to any ethical concerns related to this research.

Sincerely,

Cynthia Toman

Cynthia Toman, MScN candidate
2391 Ogilvie Road
Gloucester, Ontario
K1J 7N4
(613) 748-7960

Dr. Meryn Stuart
Faculty of Health Sciences
School of Nursing,
University of Ottawa
451 Smyth Road
Ottawa, Ontario K1N 8M5
(613) 562-5800, ext. 8436

For Ethical questions only:

Dr. Roger Proulx
President, Ethics Committee
Faculty of Health Sciences
University of Ottawa
451 Smyth Road, Room 3028
Ottawa, Ontario K1N 8M5
(613) 562-5800, ext. 8055

Appendix C: Consent Form 1

(for subjects who choose to be taped and quoted in the study)

I, the undersigned, have read the letter of information provided and hereby consent to participate in one or more audiotaped interviews by Cynthia Toman for the purpose of historical research on nurses' roles in the development of blood transfusions in Canada. I understand that transcripts of the tapes and notes will be made for study purposes. I understand that these audiotapes, transcripts, and notes will be retained by Cynthia Toman for one year following the completion of the project, and then will be destroyed at that time. I understand that my name will be used in quotes attributed to me in any results presented or published from this study.

I understand that at any time during the interview, I may refuse to answer any question, indicate that I do not wish to continue with the interview, or may withdraw my consent without a penalty of any kind. I understand that I have the right to review any tapes and transcriptions of my interview, as well as delete any sensitive material. A copy of this signed consent will be provided to me.

Dated at _____ this ____ day of _____, 199__.

Interviewee: _____

Interviewer: _____

Cynthia Toman, MScN candidate
2391 Ogilvie Road
Gloucester, Ontario
K1J 7N4
(613) 748-7960

Dr. Meryn Stuart
Faculty of Health Sciences
School of Nursing,
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For Ethical questions only:
Dr. Roger Proulx
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Ottawa, Ontario K1N 8M5
(613) 562-5800, ext. 8055

Appendix C: Consent Form 2

(for subjects who choose to be taped but not to be quoted in the study)

I, the undersigned, have read the letter of information provided and hereby consent to participate in one or more audio taped interviews by Cynthia Toman for the purpose of historical research on nurses' roles in the development of blood transfusions in Canada. I understand that transcripts of the tapes and notes will be made for study purposes. I understand that these audiotapes, transcripts, and notes will be retained by Cynthia Toman for one year following the completion of the project, and then will be destroyed. I understand that my name will not be used in any presentations and publications which result from the study and that identifying information about me will be removed.

I understand that at any time during the interview, I may refuse to answer any question, indicate that I do not wish to continue with the interview, or may withdraw my consent without a penalty of any kind. I understand that I have the right to review any tapes and transcriptions of my interview, as well as delete any sensitive material. A copy of this signed consent will be provided to me.

Dated at _____ this ____ day of _____, 199__.

Interviewee: _____

Interviewer: _____

Cynthia Toman, MScN candidate
2391 Ogilvie Road
Gloucester, Ontario
K1J 7N4
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For Ethical questions only:

Dr. Roger Proulx
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Ottawa, Ontario K1N 8M5
(613) 562-5800, ext. 8055

Appendix C: Consent Form 3

(for subjects who choose not to be taped but to be quoted in the study)

I, the undersigned, have read the letter of information provided and hereby consent to participate in one or more interviews by Cynthia Toman for the purpose of historical research on nurses' roles in the development of blood transfusions in Canada. I understand that written notes will be made during the interview for study purposes. I understand that these written notes will be retained by Cynthia Toman for one year following the completion of the project and then will be destroyed at that time. I understand that my name will be used in quotes attributed to me in any presentations or publications from this study.

I understand that at any time during the interview, I may refuse to answer any question, indicate that I do not wish to continue with the interview, or may withdraw my consent without a penalty of any kind. I understand that I have the right to review any notes as well as delete any sensitive material. A copy of this signed consent will be provided to me.

Dated at _____ this ___ day of _____, 199_.

Interviewee: _____

Interviewer: _____

Cynthia Toman, MScN student
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Appendix C: Consent Form 4

(for subjects who choose not to be taped nor quoted in the study)

I, the undersigned, have read the letter of information provided and hereby consent to participate in one or more interviews by Cynthia Toman for the purpose of historical research on nurses' roles in the development of blood transfusions in Canada. I understand that written notes will be made during the interview for study purposes. I understand that these written notes will be retained by Cynthia Toman for one year following the completion of the project, and then will be destroyed at that time. I understand that my name will not be used in any presentations and publications which result from the study and that identifying information about me will be removed.

I understand that at any time during the interview, I may refuse to answer any question, indicate that I do not wish to continue with the interview, or may withdraw my consent without a penalty of any kind. I understand that I have the right to review any notes of my interview as well as delete any sensitive material. A copy of this signed consent will be provided to me.

Dated at _____ this ____ day of _____, 199__.

Interviewee: _____

Interviewer: _____

Cynthia Toman, MSCN student
 2391 Ogilvie Road
 Gloucester, Ontario
 K1J 7N4
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For Ethical questions only:

Dr. Roger Proulx
 President, Ethics Committee
 Faculty of Health Sciences
 University of Ottawa
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Appendix D: Interview Questions

1. As a nurse, how did you learn about blood, its uses and techniques? When and where were you taught? Who did the teaching? What were your impressions / understandings about the uses for and value of blood? How did actual nursing care compare to the content and standards taught in the classroom setting?
2. Describe your earliest experience(s) with blood transfusions. Describe any other memorable experience(s) related to blood transfusions.
3. Describe your role(s) related to blood transfusion. Can you elaborate on any procedures, practice expectations, or related patient care? Who determined the procedures? Were you aware of any different practices related to blood transfusion, such as may have been used in other hospitals or settings? (Describe these.)
4. What concerns or problems did you have in carrying out these roles? Include any specific challenges or incidents which stand out in your memories. Can you recall any incidents in which nurses were influential on changing the procedures of giving blood? Describe what these changes were and why they were made.
5. Describe any situations in which the use of blood was questioned. What were the reasons given? What do you think were the reasons? How were these situations resolved? How were nurses involved in these situations?
6. How did your role (related to blood transfusion) change over time? Were there other allied health personnel involved in blood transfusions at the Ottawa Civic Hospital? Describe these persons and their roles. In your opinion, why do you think nurses became responsible for the administration of blood, the monitoring of the process, the decisions to continue or discontinue transfusions, the patient and family education about blood? Who do you think made the decisions that these would be nurses' roles? Did nurses willingly accept this responsibility? Why or why not?
7. Did your ability to manage and care for patients who needed blood transfusions have any effect on how you felt or viewed yourself as a nurse? Did it affect how you related to other nurses, physicians, or health care workers? Did it affect your career choices or opportunities? Describe these effects.
8. Is there anything else you would like to tell me about your experiences related to blood transfusion?

Appendix E: ORAL HISTORY INTERVIEWS--SELECTED PARTICIPANT BIOGRAPHICAL INFORMATION

Oral History Interview Participants						
Class	Participant	Place of Origin	Educational Background	Nursing Roles	Present Role	Related Background
1942	Jean Milligan	Ottawa	OCHSN, BScN, McGill University (1950) Masters Nursing Administration, Teacher's College, Columbia University (1962)	Graduate nurse, Nursing instructor, Director of Nursing Education, Administrator of Nursing, Assistant Executive Director	Retired as Assistant Executive Director (1979)	Taught in Post-RN program, University of Ottawa
1947	Margaret Henricks	Napanee	Belleville General Hospital (1947) Certificate, Nursing Education, University of Toronto (1949) BScN University of Ottawa (1962) MScN Syracuse University (1970)	Port Arthur Hospital School of Nursing, instructor, 2 years; OCH, Assistant Science Instructor (from 1951)	Retired (1990)	
1950	Isabel Simister	Saskatoon and Winnipeg	OCHSN Public Health Certificate, University of Toronto (1951)	Secretary, Hudson's Bay Company to age 28; Public Health Nurse in Kirkland Lake (1951- 1953); Victorian Order of Nurses, Calgary and Ottawa from 1953.	Retired as a Regional Administrat or of VON	Entered nursing at age of 28, after war and death of her father

Oral History Interview Participants						
Class	Participant	Place of origin	Educational Background	Nursing Roles	Present Role	Related Background
1958	Patricia Crossley	Pembroke, Ottawa Valley	OCHSN University of Western Ontario, certificate in nursing education (1961); University of Ottawa, BScN (1970)	Graduate nurse, Nursing Instructor, OCHSN (1960-1973), Acting chair of Nursing Education, 1980s	Retired as Nursing educator (1990)	Transferred to the Algonquin Community College School of Nursing when the OCH school closed
1960	Gwen Hefferman	Almonte	OCHSN University of Ottawa, BScN (1963) Syracuse University, MScN (1970)	Graduate nurse, Junior Educator OCHSN, Nursing Instructor (1962); Research Coordinator (1970); Assistant Director of Inservice (1973)	Director of Nursing Education, OCH	Graduate of the "Interne" program
1967	Florence Draper Kinsella	Wyman, Quebec	OCHSN Algonquin College continuing education courses	Graduate nurse, continuous for 30 years	Staff nurse, OCH	Graduate of the "two plus one" nursing program

Oral History Interview Participants						
Class	Participant	Place of Origin	Educational Background	Nursing Roles	Present Role	Related Background
1970	Wendy (McKnight) Nicklin		OCHSN BN, McGill University (1973) MScN, McGill University (1978)	RN emergency, OCH (1970); Clinical Nurse Specialist, Emergency (1978-1980); Nursing Care Coordinator, Heart Institute (1980-83); Coordinator, Cardiac Rehabilitation Program (1983-1985); Director of Special Services (1985-1988); Vice-President, Nursing (1989-1992); Vice-President, Patient Services, (1992-1997); Chief Operating Officer (1997-1998).	Site Operating Officer, Ottawa Hospital, Civic Site (1998)	Taught at Queen's University and Algonquin College, responsible for setting up critical care and emergency programs Graduate of the "two plus one" nursing program University lecturer, nursing (1973-1976)
1972	Kathy Slattery		OCHSN BScN, University of Ottawa	Graduate nurse (1972-1982); Nurse Manager, Emergency Department, 2 years; Clinical Nurse Educator	Clinical Nurse Educator, OCH	Educator for Paramedic program Graduate of the "two year program"

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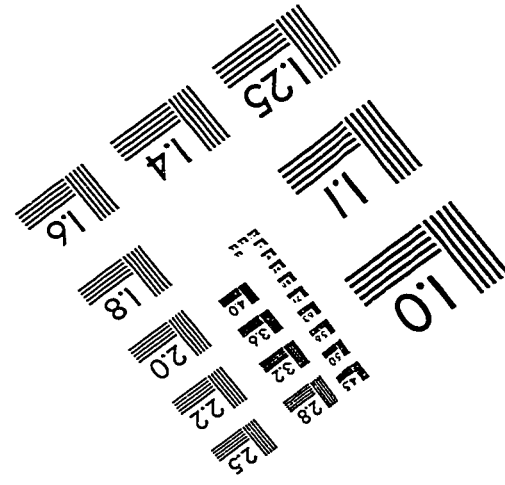
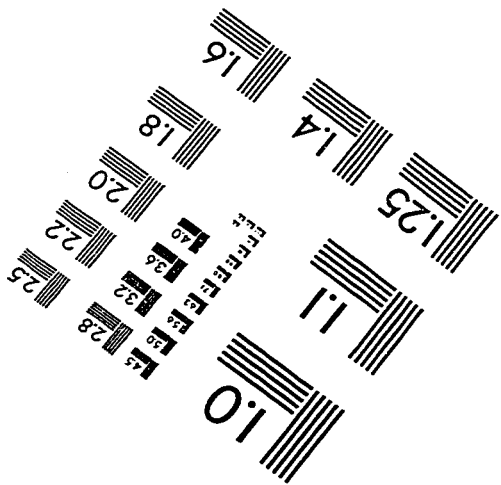
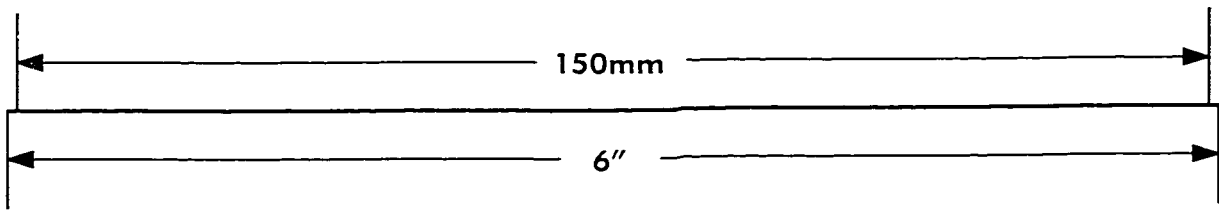
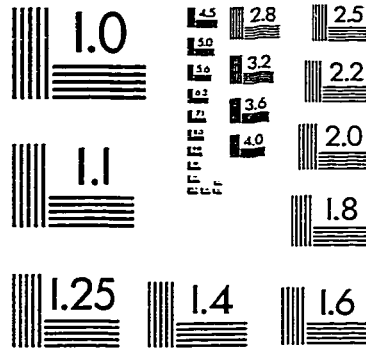
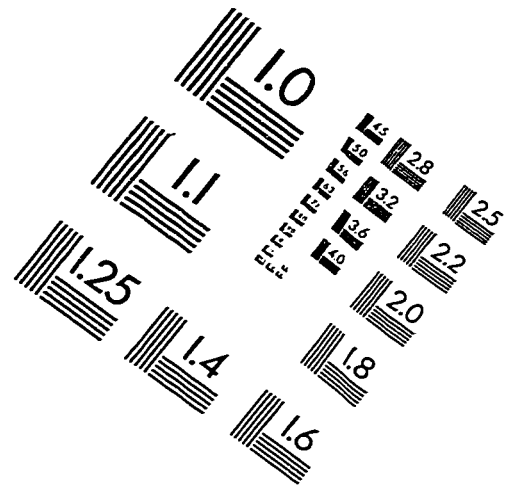
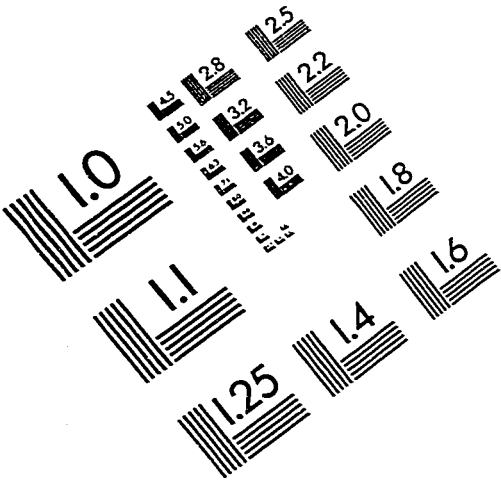
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