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Article abstract

The absence of ordinary women from histories of science and technology may be partially explained by *what* has been excluded as science, as well as *who* have been excluded as women of science. Although the delegation of medical technology to Ontario nurses increased rapidly during the mid-twentieth century, we know very little regarding how these ordinary women engaged in science and medical technology through the everyday practice of “body work.” Gender structured the working relationships between predominantly-male physicians and predominantly-female nurses, shaping the process of delegation and generating significant changes in nurses’ work as well as who provided bedside care. Trained nurses parlayed these new technological skills to their advantage, enabling the extension of technological care at the bedside and assuring their roles as essential for the functioning of the hospital system.

“Body Work”: Nurses and the Delegation of Medical Technology at the Ottawa Civic Hospital, 1947-1972

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Abstract: The absence of ordinary women from histories of science and technology may be partially explained by *what* has been excluded as science, as well as *who* have been excluded as women of science. Although the delegation of medical technology to Ontario nurses increased rapidly during the mid-twentieth century, we know very little regarding how these ordinary women engaged in science and medical technology through the everyday practice of “body work.” Gender structured the working relationships between predominantly-male physicians and predominantly-female nurses, shaping the process of delegation and generating significant changes in nurses’ work as well as who provided bedside care. Trained nurses parlayed these new technological skills to their advantage, enabling the extension of technological care at the bedside and assuring their roles as essential for the functioning of the hospital system.

Résumé : L’absence de femmes ordinaires dans l’histoire des sciences et de la technologie peut en partie s’expliquer par *ce* qui a été exclu des sciences et par *qui* a exclu les femmes des sciences. Si la délégation de la technologie médicale aux infirmières de l’Ontario s’est accélérée dans la seconde moitié du 20^e siècle, nous en savons très peu sur ces femmes ordinaires oeuvrant dans le domaine des sciences et de la technologie médicale par leur pratique quotidienne du « travail corporel ». Cet article examine la façon dont les relations marquées par les rapports sociaux de sexes entre le personnel médical, à prédominance masculine, et le personnel infirmier, à prédominance féminine, ont façonné un processus de délégation qui a transformé tant le travail infirmier que l’identité des personnes travaillant au chevet des malades. Les infirmières diplômées ont mis à profit leurs nouvelles compétences techniques, permettant un élargissement des usages de la technique au chevet des patients et se rendant elles-mêmes essentielles au fonctionnement du système hospitalier.

Ordinary women, who engaged with science and technology through their everyday work and created scientific knowledge through the process

of work itself, are conspicuously absent from historical accounts which have focused on “exceptional” women who achieved recognition within professions that have been traditionally identified with men.¹ *What* has been excluded as science, as well as *who* have been excluded as women in science may partially explain that omission. Historians have focused generally on basic or pure sciences as a legitimate scientific domain but, as Ruth Schwartz Cowan has reminded us, “[k]nowledge comes in many forms, which can be acquired in many different ways, and gets applied all the time.”² As such, nursing, a traditionally-female profession solidly based on the sciences, offers an ideal case study in which to examine the intersecting and reciprocal relationships between ordinary women, scientific knowledge and technology.³ As one of several women’s occupations that professionalized during the early 1900s, nursing provided

1. Pnina G. Abir-Am and Dorinda Outram, eds., *Uneasy Careers and Intimate Lives: Women in Science, 1789-1979* (New Brunswick, N. J.: Rutgers University Press, 1987); Sally Gregory Kohlstedt, ed., *History of Women in the Sciences: Readings from ISIS* (Chicago: University of Chicago Press, 1999); and Margaret W. Rossiter, *Women Scientists in America: Struggles and Strategies to 1940* (Baltimore: Johns Hopkins University Press, 1982).

2. 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, 3 (1996): 581. See also, 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, 1 (1997): 9-30.

3. A small body of nursing historiography focuses on medical technology and nurses’ work: Julie Fairman and Joan Lynaugh, *Critical Care Nursing: A History* (Philadelphia: University of Pennsylvania Press, 1998); Julie Fairman, “Alternate Visions: The Nurse-Technology Relationship in the Context of the History of Technology,” *Nursing History Review* 6 (1998): 129-146 and “Watchful Vigilance: Nursing Care, Technology, and the Development of Intensive Care Units,” *Nursing Research* 41, 1 (1992): 56-60; Margarete Sandelowski, *Devices and Desires: Gender, Technology, and American Nursing* (Chapel Hill: University of North Carolina Press, 2000); “‘Making the Best of Things’: Technology in American Nursing, 1870-1940,” *Nursing History Review* 5 (1997): 3-22; “Thermometers & Telephones: A Century of Nursing and Technology,” *American Journal of Nursing* 100, 10 (2000): 82-86; “The Physicians’ Eyes: American Nursing and the Diagnostic Revolution in Medicine,” *Nursing History Review* 8 (2000): 3-38; “Venous Envy: The Post-The Second World War Debate Over IV Nursing,” *Advances in Nursing Science* 22, 1 (1999): 52-62; “Troubling Distinctions: A Semiotics of the Nursing/Technology Relationship,” *Nursing Inquiry* 6 (1999): 198-207; “(Ir)Reconcilable Differences? The Debate Concerning Nursing and Technology,” *Image: Journal of Nursing Scholarship* 29, 2 (1997): 169-174; and “Exploring the Gender-Technology Relation in Nursing,” *Nursing Inquiry* 4 (1997): 219-228; Cynthia Toman, “‘Trained Brains are Better than Trained Muscles’: Scientific Management and Canadian Nurses, 1910-1939,” *Nursing History Review* 11 (2003): 89-108; “Blood Work: Canadian Nursing and Blood Transfusion, 1942-1990,” *Nursing History Review* 9 (2001): 51-78; and “Almonte’s Great Train Disaster: Shaping Nurses’ Roles and Civilian Use of Blood Transfusion,” *Canadian Bulletin of Medical History* 21, 1 (2004): 145-157.

women with opportunities for training, paid employment and professional identity throughout the twentieth century. More women trained as nurses than as any other occupational or professional group, and nurses have traditionally comprised the largest group of health care providers.⁴

Historians have suggested that early nurse leaders and nurse educators intentionally sought scientific credibility through use of biomedical technologies to legitimate their claims as a profession.⁵ But how were these technologies transferred to rank-and-file bedside nurses? And how did gendered relationships between predominantly-male physicians and predominantly-female nurses shaped this process? In this article, I argue that the rapid transfer of medical technology from physicians to nurses during the mid-twentieth-century shifted the division of labour related to “body work” in hospitals, with gender as the primary mediating variable that shaped both the work and the workers. Originally articulated by sociologist Anselm Strauss, the concept of “body work” refers here to the myriad activities that nurses have always performed : the treatments and care provided for patients’ bodies, the scientific knowledge associated with carrying out these procedures, and the nurses’ skillful use of their own bodies as part of medical technology.⁶ Graduate nurses learned to parlay new technological skills to their advantage while enabling the extension of technological care at the bedside and assuring their positions as essential to the functioning of hospital systems.⁷

4. Barbara Melosh, *“The Physician’s Hand”: Work, Culture and Conflict in American Nursing* (Philadelphia: Temple University Press, 1982); 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*, eds. Diana Elizabeth Long and Janet Golden (Ithaca: Cornell University Press, 1989), 135-156; 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), 71-101 and *Bedside Matters: The Transformation of Canadian Nursing, 1900-1990* (Toronto: Oxford University Press, 1996).

5. Reverby, “A Legitimate Relationship,” 146; McPherson, “Science and Technique”; Patricia D’Antonio and Julie Fairman, “Organizing Practice: Nursing, the Medical Model, and Two Case Studies in Historical Time,” *Canadian Bulletin of Medical History* 21, 2 (2004): 411-429.

6. Anselm Strauss, Shizuko Fagerhaugh, Barbara Suczek, and Carol Wiener, *Social Organization of Medical Work* (Chicago: University of Chicago Press, 1985): 260-261. The authors refer to “body work” primarily as work with or on patients’ malfunctioning bodies, acknowledging but neglecting aspects of working with one’s own body.

7. Technological skills as used within the nursing discipline, refer to nurses’ roles and responsibilities for the insertion and/or application of a wide range of devices, either on or into patients’ bodies. Nurses then monitor, adjust, clean and maintain these devices while using them to obtain and report data about their patients, make key or critical decisions

My analysis of the multiple ways in which gender intersects with medical technology in health care systems enables me to explore the pervasive and unequal distribution of power—both between physicians and nurses, and among nurses themselves.⁸ It rests on a case study of the Ottawa Civic Hospital (OCH) located at Ottawa, during the period between 1947 and 1972.⁹ The OCH was a large urban municipally-owned hospital with its own School of Nursing that exerted substantial influence on nursing practice over the decades under study. Between 1947 and 1972, Ontario nurses experienced substantial changes in their practice related to the incorporation of technological care into their everyday work. Delegation was the specific process whereby physicians transferred technological roles and responsibilities at an increasing rate, beginning with one delegated medical act in 1947 and increasing to thirty-three delegated medical acts by 1972. As the number of delegated acts increased, the nature of nurses' work changed significantly as did the level of experience required by nurses providing the hands-on bedside care. Delegation was not, however, a smoothly-flowing diffusion of roles and responsibilities across disciplinary boundaries. Nurses contested some delegation and negotiated occupational spaces related to other delegated acts.

The Formalization of Delegated Medical Acts

During the first half of the twentieth century, hospitals grew in size and public acceptance throughout North America. With a need for inexpensive but dependable labour, hospitals established training schools for nurses wherein the students exchanged extended hours of labour for their education, room and board. Although hospitals hired a small number of nurses as supervisors and educators once they completed their training, the majority of nurses worked in private duty and were referred to as "graduate nurses." Thus student nurses provided most hospital nursing care, and as a novice workforce that turned over every three years,

about care, and deliver treatments. These roles are often contrasted with "caring roles," referring to a range of psycho-social and supportive care activities that seldom require the use of devices. See Sandelowski, *Devices and Desires*, 100-104.

8. Kathryn McPherson, Cecilia Morgan, and Nancy M. Forestell, eds., *Gendered Pasts: Historical Essays in Femininity and Masculinity in Canada* (Don Mills, Ontario: Oxford University Press, 1999), 4-5.

9. Approval for the study was granted by the University of Ottawa Human Research Ethics Board. Each participant agreed to be quoted in the study and resulting publications.

inhibited the development of an experienced bedside workforce during this early period.¹⁰

Student nurses at work in the diet kitchen during the mid-1920s.



Photograph used with permission from the Ottawa Civic Hospital Archives.

A major portion of student nurses' training involved the acquisition of many skills and techniques. Historian Kathryn McPherson has argued cogently that nursing rituals and procedures constituted "nursing science" prior to the 1940s, suggesting that germ theory and scientific management shaped at least two conflicting discourses related to nurses.¹¹ On the one hand, germ theory situated nurses in a subordinate position within the health-care hierarchy because of the close association between nurses' cleaning and disinfecting activities, and domestic service. For its part, scientific management became a pervasive, wide-spread social movement that imposed constraints on nursing practice through both the routinization of care activities and loss of autonomy under the rubric of nursing "efficiency." On the other hand, the mastery of nursing rituals based on

10. George M. Weir, *Survey of Nursing Education in Canada* (Toronto: University of Toronto Press, 1932).

11. McPherson, "Science and Technique," 78-88, and *Bedside Matters*, 86-94.

both of these theories, provided nurses with marketable skills and expertise that differentiated them from non-professional care givers.¹²

Canadian hospital nurses felt pressured to take on responsibility for more medical technologies throughout the first decades of the twentieth century. During the late 1930s, the Canadian Hospital Council requested that certain procedures be authorized for “specially trained graduate nurses” based on a “shortage of interns and increased use in modern medicine of various clinical procedures [...]”¹³ Before responding to the request, however, the Canadian Nurses Association surveyed 130 hospitals across Canada regarding ten specific clinical procedures,¹⁴ and whether or not nurses were already performing them in the surveyed hospitals. Published in 1941 as the “Report of the Committee on Nursing and Nurse Education in Canadian Hospitals,” the report revealed graduate nurses were not typically performing these procedures and that student nurses were not permitted to carry them out at that time.

Considering how few technological skills were part of civilian nursing practice at that time, the Canadian Hospital Council then proceeded to ask the Canadian Nurses Association and the Canadian Medical Association to shift these technologies to graduate nurses. Nurse leaders, however, contested the delegation of these additional responsibilities as both a professional and workload issue. Leaders argued that these procedures and technological skills were medical acts, and as such, beyond nurses’ scope of practice. They raised concerns regarding legal accountability and the hospitals’ liability if nurses did assume these roles. But they stopped short of refusing the delegation—deferring to male authority in the matter. The entire matter was finally dropped when the Canadian Medical Association rejected the Council’s recommendation outright.¹⁵ With the onset of the Second World War, other issues captured everyone’s

12. 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.

13. Archives of Ontario [hereafter as AO], RAO fonds, 96B-5-14, “Performance of Clinical Procedures by Graduate Nurses: A Special Study by Committee on Nursing and Nurse Education,” in “Report of the Committee on Nursing and Nurse Education in Canadian Hospitals,” *Bulletin*, vol. 36 (1941): 48.

14. These ten procedures included: taking blood pressure readings, giving fluids into interstitial tissues, giving intravenous saline or glucose solutions, giving other intravenous medication, giving intramuscular injections, removing sutures, taking blood samples, performing ordinary dressings, taking clinical histories (excluding the actual physical examination), and acting as the “First Assistant” in major operations which often included suturing at superficial tissue and skin levels.

15. “Report of the Executive Secretary of the CNA,” *Canadian Nurse* 38, 9 (1942): 725.

attention and civilian hospitals were left to cope as best they could with technological changes, at least for the duration of the war.

Canadian military nurses soon demonstrated their ability to readily incorporate new medical technologies such as transfusion, intravenous therapies, and penicillin into nursing practice, often under very adverse conditions during their overseas postings in England, Northwestern Europe and Italy.¹⁶ Any flexibility of gendered roles during the war, however, was contingent on the availability of medical men to perform the tasks at hand as well as the geographical and social distance of wartime postings from usual civilian practice settings—avoiding disruptions and threats to traditional masculine and feminine hospital work relationships. When military nurses returned to Canada and/or civilian practice, they were to resume their former roles and relationships, including restrictions on nursing practices.

By 1947, however, there was a severe shortage of at least two-thousand physicians within Ontario, which prompted hospitals and physicians to acquiesce and authorize “intravenous and blood infusions” as the first medical act delegated to nurses in the province. The College of Physicians and Surgeons of Ontario clearly indicated that this act was to be performed only by “specially trained nurses” and not by all trained nurses, since they “did not believe these responsibilities should be included in the regular duties of a nurse.”¹⁷

The Ottawa Civic Hospital Board of Trustees subsequently hired two nurses, Miss Louise Gourlay and Miss Gladys Moorehead, for training in the administration of blood transfusions throughout the hospital. Both graduates of the hospital’s school of nursing who had been working in private duty, they became known popularly as the “Blood Team,” with Gourlay remaining Director, and Morehead, Clinical Director, until their retirements in the late 1960s. The Blood Team earned the respect of students and physicians alike, initially enjoying autonomy with scheduling, better employment conditions, and more collegial nurse-

16. Cynthia Toman, “‘Ready, aye Ready’: Canadian Military Nurses as an Expandable Workforce, 1920-2000,” in *On All Frontiers: Four Centuries of Canadian Nursing*, eds. Dianne Dodd, Tina Bates, and Nicole Rousseau (Ottawa: University of Ottawa Press and Canadian Museum of Civilization, 2005), 169-182, and “‘An Officer and a Lady’: Shaping the Canadian Military Nurse, 1939-1945,” in *Out of the Ivory Tower: Feminist Research for Social Change*, eds. Andrea Martinez and Meryn Stuart (Toronto: Sumach Press, 2003), 89-115.

17. College of Nurses of Ontario (hereafter as CNO), H.W. Henderson, “Delegation of Special Procedures: The Current Situation,” address to the Ontario Hospital Association, 1 December 1981.

physician relationships.¹⁸ By 1953, hospital physician Dr. Fisher reported to the General Medical Board that, “the scope of the Blood Team has been enlarged, but the work increases as fast as suitable nurses can be secured.”¹⁹

Beginning with the first delegated medical act (DMA), graduate nurses continued to incorporate a range of medical technologies into everyday nursing practice until by 1972, there were thirty-three officially delegated acts at the OCH—a trend reported throughout Canada and North America. Delegated medical acts typically became part of standard nursing practice over time.²⁰

A St. John Ambulance nurse provides suction for a blood donation at the Ottawa Civic Hospital Outpatient Department during the 1940s.



Source: Norman Miles Guiou, Transfusion: A Canadian Surgeon's Story in War and in Peace (Yarmouth, NS: Stoneycroft, 1985). Photograph used with permission from the publisher.

Nurses, however, contested the delegation of some proposed technologies through their professional organizations. When the College of Physicians and Surgeons of Ontario approved tuberculosis tests and

18. J. Milligan, audio-taped interview with author, Ottawa, 29 October 1997; Donna Martin, personal communication with author, Ottawa, 1 April 1998.

19. City of Ottawa Archives (hereafter as COA), MG 38, General Medical Board (GMB), Minutes, 26 November 1953.

20. CNO, “Policy on Special Procedures by Registered Nurses and Technical Personnel,” Report to the College of Physicians and Surgeons of Ontario (hereafter as CPSO), July 1967; LW Barr to the CPSO, 7 June 1967 and 30 December 1969. See also McPherson, *Bedside Matters*, 220-221; Sandelowski, *Devices and Desires*, 102-115.

immunization injections for administration by nurses in 1957, the Registered Nurses Association of Ontario protested, claiming that their members had not been consulted. The RNAO invoked the lack of training and legal protection, claiming these procedures were outside the scope of nursing practice and arguing that they imposed an unacceptable burden on nurses during a period of workforce shortage. A year later, the RNAO opposed once again the delegation of intravenous medications to nurses but, this time, it agreed to a compromise with the College of Physicians and Surgeons of Ontario. In a jointly-issued statement entitled "Warning Notices," both organizations referred to the administration of intravenous medications as a medical act, to be performed by nurses only in situations where physicians were unavailable. When the College of Nurses of Ontario became the regulatory body for nursing (1961), it decided that the medical profession could *delegate* acts to nursing but the nursing profession had the right to *accept or reject* the delegation. The College of Nurses of Ontario then referred to delegated acts accepted by the nursing profession as "sanctioned medical acts."²¹

Thus, delegation had become a formalized process, adaptable to different technologies and readily documented. At the OCH, for example, individual nurses were allowed to perform a DMA only after receiving personal instruction from a physician, giving a return demonstration, passing a written examination, and repeating both the test and the return demonstration annually. The hospital maintained index card records to track nurses by name, noting when and how each specific skill was delegated, who taught the skill, along with the exam date, annual re-certification dates and signatures. This process, known popularly among nurses as "carding," provided a form of legal documentation regarding the transfer of responsibility for specific medical technologies from physicians to individual nurses.

Technology proliferated during the 1950s and 60s at the OCH. The Nurse Technician Team, as the "Blood Team" was re-named, expanded to keep up with demands for specialized roles such as taking blood pressures, giving intramuscular injections, administering intravenous antibiotics and chemotherapy, performing fibrinogen leg scans, and managing central venous lines. Like in the case of blood transfusion, OCH policy permitted only "specially trained" nurses to take blood pressures, under specific circumstances during the early 1950s. One such early policy read, "Nurses may take blood pressure readings on skull or

21. Henderson, "Delegation of Special Procedures;" H.G. McArthur, "A College of Nurses for Ontario," *Canadian Nurse* 56, 6 (1960): 515-518.

accident cases at regular intervals after midnight....”²² But by 1954, the Hospital Board requested nursing instructors to teach all students to take blood pressures; soon after, the policy changed so that taking blood pressure measurements became a standard nursing skill expected of all nurses.²³

Not surprisingly, policies regarding delegation were contingent on gendered hospital service needs, rather than on the needs of students who would eventually graduate to work primarily in private duty. In 1947, for example, the Director of the School of Nursing, Edith Young, proposed to the OCH Medical Board that students be trained to give intramuscular injections, and acquire the knowledge and skill to work in outlying districts after graduation. The Board referred her request to the College of Physicians and Surgeons, but it took no further action on the request for another six years. It finally approved intramuscular injections as a delegated act for nurses only when the interns complained that “injection treatments [had] multiplied so that all junior interns were spending two full mornings a week on nothing else.” The increasing number of injections created workload issues for nurses as well; but once a procedure became identified as “nurses’ work,” it remained nurses’ work. Young tried to give the procedure back to interns in 1954, but the Board refused that request.²⁴

As these early examples of delegated acts indicate, medical technology increased substantially after 1947 at the OCH, and nurses took on many new technological roles and responsibilities as a result. The shifting of medical technology across professional boundaries was partially based on a well-defined delegation process that served the needs of hospitals and physicians. Whether the delegation process benefited nursing is less clear. As I argue, it reinforced patriarchal relationships between nurses and physicians, shifted care giving from student nurses to a graduate nurse staff, and ultimately led nurses to differentiate among themselves as either general duty or specialty nurses based on their technological skills.

22. COA, MG 38, GMB, Minutes, 28 September 1951.

23. COA, box 6, Faculty Organization Folder, Minutes, 15 January 1947, Nursing Policy Book (15 February 1954); Ottawa Civic Hospital Archives (hereafter OCHA), Nursing Procedure Book, Blood Pressure Procedure, July 1954.

24. COA, MG 38, box 10, Finances and Property Committee, Minutes, 5 February 1947; GMB, Minutes, 11 October 1950; 25 November 1953; 15 December 1954; and COA, MG 38, box 11, Medical Advisory Board (MAB), 25 September 1953 and 18 November 1954.

Gendering Delegation

Gender shaped the delegation of medical technologies from physicians to nurses, reflecting the highly-gendered relationships that already existed in hospitals. As North American hospitals grew between 1900 and the 1950s, they typically evolved from charities to publicly-administered agencies. Governance of hospitals shifted away from the control of lady superintendents and lay leaders, to hospital boards made up of male trustees and physicians. Even directors of schools of nursing, such as Edith Young, lacked a place on Medical Advisory Boards—having to await an invitation to attend meetings and then, only for specific agenda items that the board felt necessary to bring to her attention.

The institutional culture and structures of hospital work took on gendered attributes, wherein prevailing discourses portrayed physicians as “captains of the ship” and “fathers of the family,” with nurses depicted as “mothers,” patients as the “children” and the hospital as a “house” — from which we still have the expression “house doctor” today. Nurses were expected to show deference to the physician’s authority at all times and enforce medical discipline over the patients, thereby assuring their compliance to medical treatment regimes.²⁵ Nurses were warned repeatedly that they were never to diagnose illness, and to refer any patients’ questions to the physicians.

Although nurses were essential for the expansion of medical technology,²⁶ their capacity to assert and negotiate their roles was jeopardized by the medical division of labor associated with delegation, to the advantage of the predominantly male medical profession.²⁷ According to the 1948 OCH annual report, for example, new medical technologies invested nurses with increased professional status, which remained, however, subordinated to the physicians’ status: “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

25. David Gagan, *A Necessity among Us: The Owen Sound General and Marine Hospital, 1891-1985* (Toronto: University of Toronto Press, 1990); Reverby, *Ordered to Care* and Melosh, “*The Physician’s Hand*.”

26. Julie Fairman noted that “[n]ursing is central to the use of technology in hospitals, in fact, it may be argued that the nurse makes technology systems possible.” “*Alternate Visions*,” 137.

27. Strauss et al., *Social Organization of Medical Work*, 274.

and nursing is a real profession.”²⁸ Physicians thus reserved the more prestigious, conceptual aspects of technological work (such as diagnosis of the situation and prescribing the technology) for themselves, while delegating less desirable, routinized or inconvenient aspects of the technology to nurses. In this manner, they separated the science (knowledge work) of medical technologies from the art (skills and techniques) of these same technologies.

Physicians used their influence as members of hospital boards and as lecturers for schools of nursing to shape and limit the type of knowledge nurses could develop. From the 1870s in Canada, physicians gave the majority of formal lectures in nursing schools, with the exception of courses identified as the “nursing arts,” wherein nurse supervisors and instructors taught students specific nursing procedures and tasks. According to E. Stanley Ryerson, a physician and faculty member at the University of Toronto, nurses were not supposed to acquire too much scientific knowledge. In a 1930 article he wrote on curriculum development for the *Canadian Nurse* journal, he noted that “most lectures of this type should be inspirational, rather than to impart knowledge.”²⁹ He further explained that one or two lectures in chemistry, physics, and biology were sufficient because “practical work with patients forms the *back-bone and body* of the nursing course [emphasis added],” and because too much knowledge ruined a nurse for the bedside.³⁰ Ryerson had ample opportunity to shape the knowledge base of nurses in and beyond Ontario since physicians from the University of Toronto were affiliated with the Toronto General Hospital, which operated one of the largest training schools in Canada and graduated large classes of nurses who subsequently practiced all across Canada.

Student nurses at the OCH during 1950s reported similar training experiences. Isabel Simister noted that “We had to get most of our knowledge from the doctor.” For her part, Gwen Hefferman recalled: “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.” It wasn’t until the mid-1960s that nursing instructors gave the majority of lectures and gained a measure of control over the construction of nursing knowledge. According to Hefferman, who became an instructor during the early 1960s, “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

28. Ottawa Civic Hospital Annual Report [hereafter as OHAR], 1944: 23-24.

29. E. Stanley Ryerson, “The Preparation of a Curriculum,” *Canadian Nurse* 25, 9 (1929): 538.

30. Ryerson, 537.

that we stopped inviting them to present.”³¹ Eventually, nurse educators became responsible for the training associated with delegated acts as well. Pat Crossley described the delegation of intramuscular injections at the OCH during the 1950s in the following way: “There was this one physician who taught the nurses to do [intramuscular injections] because it was not in the basic program and [nurses] had to go down to ... the outpatients department and be taught, and be tested and strut their stuff in front of Dr. Fisher ... But when I came in, nurses were teaching [intramuscular injections] ... blood pressures ... and a number of the sanctioned medical acts.”³²

The separation of the science and art also involved delegating the less desirable aspects of medical technologies to nurses whenever physicians found these inconvenient, routinized, boring or time-consuming. For example, physicians ordered blood transfusions, including the amount and rate of administration. But nurses did the rest: they prepared the patient, inserted the needle, hung the individual units of blood, monitored the patient and solved any arising problems during administration. According to a 1952 blood transfusion procedure at the OCH, “The doctor is responsible for regulating the rate of flow—usually 30-50 drops per minute. The nurse should see this is maintained.”³³ Yet, as I explained in an earlier article, there was an amazing amount of invisible work required to maintain a transfusion.³⁴ However, nurse Hefferman contends that by the mid-1960s, “technically, the physician was supposed to order [the infusion rate] but they left it to our judgment.” In 1979, nurses were left to determine the rate based on a general guideline of “approximately three hours for one unit of whole blood or two hours for one unit packed cells.”³⁵

Timing, convenience and the degree of visibility or invisibility associated with a particular medical technology influenced who did what in hospitals. Hospitals offered little opportunity to demonstrate privileged legal or professional powers regarding restricted skills during weekends, evenings, nights or holidays, when there were few observers around to see physicians performing what Strauss referred to as symbolic work.³⁶

31. Isabel Simister, audio-taped interview with author, Ottawa, 22 January 1998; Gwen Hefferman, audio-taped interview with author, Ottawa, 29 January 1998.

32. Patricia Crossley, audio-taped interview with author, Ottawa, 26 January 1998.

33. OCHA, Procedure books.

34. Toman, “Almonte’s Great Train Disaster” and “Blood Work.”

35. Hefferman interview; OCHA, Procedure books.

36. Strauss referred to the visibility of work as “symbolic work,” or activity that physicians persist in performing, competently or incompetently, because it is with

Therefore, nurses who worked on weekends, evening and night shifts, or during holidays, could carry out any number of essential procedures that were prohibited to them during regular working hours.

In a similar manner, many medical technologies associated with direct body contact, manual dexterity, repetitive motions or a need for meticulous attention to detail were transferred to nurses—a process that socially constructed these technologies as “women’s work.” This term is linked to the concept of “dirty work” or work that may be “designated dirty,” because of its alleged inconvenience, relative invisibility (and therefore of lower status) or being unsatisfying due to repetitive, exhausting, routinized, stressful, or physically dirty characteristics. These designations carry derogatory connotations and thereby problematize nurses’ work through its association with physical care of the human body.³⁷

Delegation was contingent on the constant presence of experienced nurses at the bedside and their growing familiarity with medical technologies, in order to assure patient compliance and safety during their use. In 1948, one astute nurse leader portrayed nurses’ technological knowledge as invisible but essential: “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.”³⁸ Sometimes, their work was publicly acknowledged, as in a 1955 report to the OCH Board on a series of hospital adverse incidents related to transfusions, which claimed that many more fatalities “may have been avoided because of the conscientious Blood Team.”³⁹

Two unanticipated results of increased nursing competency with technological skills was a corresponding decline in physician and intern skills, and increased expectations from the general public for technological care. Interns and residents at the OCH, for example, had fewer opportunities to practice venipuncture techniques after the establishment of the Blood Team and Intravenous Team. The hospital then decided to assign all of the interns to a period of time working with the Blood Team to compensate for lost practical experiences—an example

associated legal and professional power and thus sustains the professional right to do so. Strauss et al., *Social Organization of Medical Work*, 272.

37. *Ibid.*, 246-251 and 268-272; Jocalyn Lawler, *Behind the Screens: Nursing, Somology, and the Problem of the Body* (Don Mills, Ontario: Benjamin/Cummings Publishing Company, 1993), 44-50 and *The Body in Nursing* (Melbourne, Australia: Churchill Livingstone, 1997); Sandelowski, *Devices and Desires*, 10-11.

38. OCHA, Esther Lucile Brown, *Nursing for the Future: A Report Prepared for the National Nursing Council* (n.p., 1948): 81.

39. COA, MG 38, GMB, Minutes, 16 December 1955.

of those seldom-documented situations in which physicians learned from nurses.⁴⁰ Meanwhile, in 1949, patients, families and citizens of Ottawa testified, during a highly-publicized Judicial Inquiry on the state of medical and nursing care at the OCH, that there were not enough experienced nurses to keep up with all the technological changes.⁴¹ Among other recommendations, the judge called for the hiring of more graduate nurses; a move the hospital's Medical Advisory Board agreed to do "regardless of cost."⁴²

Many North American hospitals struggled with increased medical technologies and the delegation of medical acts to nurses during the 1950s and 1960s. One solution involved clustering specialized equipment, nurses with specialized skills, and patients with intensive nursing care needs into units such as recovery rooms, intensive care units, and coronary care units. In these specialized units, physicians and nurses learned from each other in highly technological settings. Nurses used their constant presence at the bedside, their greater familiarity with equipment and machines, and the proficiency they acquired with frequent performance of skills and procedures, to shape a different kind of knowledge about patients.

However, the continued expansion of medical technology in health care, depended on developing a critical mass of experienced nurses at the bedside, changing the nature of bedside care and replacing the traditional student nurse workforce. These nurses also had to remain in practice over extended periods of time in order for delegation to be economically feasible and practical from the hospital's perspective. The OCH Board argued, for example, that the training process was expensive, that nurses needed to use these delegated skills frequently enough to maintain proficiency with them, and that the nursing staff had to be stable for this training to be cost-effective.⁴³ Traditionally, hospitals experienced an almost complete turnover of bedside nurses every three years. Students typically graduated to work as private duty nurses for a few years before "retiring" to marriage, thus meeting societal expectations for women in the workforce at that time. Kathleen Ellis, former Superintendent at Winnipeg General Hospital, noted in 1942 how "increases in technical personnel and procedures place added demands on the quality and

40. Elizabeth Fenton, retired Chief Technologist of the OCH Blood Bank from 1943-1985, personal communication with author, 22 May 1998.

41. COA, MG 38, vol. 36, "Judicial Inquiry, vol. I-III,"

42. COA, MG 38, box 17, MAB, Minutes, 8 April 1952.

43. OCHA, loose papers, 1 March 1976, SMA binder on delegated acts; letter from J. Milligan to S. Kerr, 5 February 1975.

quantity of nursing service.... Student nurses can no longer be relied on as a major support of hospital service.”⁴⁴

But a stable workforce was elusive at the time; experienced nurses were neither easily found nor easily convinced to remain in practice during the 1950s and 1960s. Canadian graduate nurses had mobilized readily in support of both military and civilian nursing needs during the Second World War—either to serve in the military or to replace other civilian nurses who had enlisted. However, in contrast to other women who experienced job losses after the war, nurses were pressured to remain in the workforce even after they married and had children. Hospitals experimented with more flexible hours, split shifts, and reduced work weeks to accommodate these married nurses who simply refused to work otherwise.⁴⁵

In 1949, the OCH’s annual report partly blamed medical technology for its own nursing shortage, claiming that: “Advances in medicine and surgery have provided such complexities in nursing service requirements, and such increased responsibilities that graduate nurses avoid hospital work.”⁴⁶ Indeed conditions at the OCH had become intolerable. Following the publication of two alarming *Ottawa Citizen* editorials in 1949, the city conducted a judicial inquiry into the state of care at the hospital, with evidence from more than seventy witnesses (including patients, nurses, physicians, and administrators)—some by their own accord and some under subpoena.⁴⁷ These witnesses described long waiting periods, inexperienced nurses, dirty wards, prolonged pain and suffering, medication errors, and lack of observation during post-anaesthetic recovery.⁴⁸ One patient claimed she had to watch her intravenous infusion closely through the night, explaining that her nurse had trouble regulating the rate and that if the infusion stopped, the nurse would have to get a “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.”⁴⁹ The presiding judge, the Honorable A. G. McDougall, attributed

44. K.W. Ellis, “Nursing Trends in War Time,” *Winnipeg General Hospital Nurses’ Alumnae Annual* (1942): 9-10.

45. Ruth Roach Pierson, *They’re Still Women After All: Canadian Women and the Second World War* (Toronto: McClelland and Stewart, 1986); McPherson, *Bedside Matters*, 206-210; Milligan interview.

46. OHAR, 1949: 38.

47. Editorials, *Ottawa Citizen*, 28 February 1949 and 4 March 1949.

48. COA, MG 38, vol. 36, “Judicial Inquiry, vol. I-III”; COA, Minutes of the City Council, 2 August 1949, “Civic Hospital.”

49. Judicial Inquiry, vol. III: 202-203.

the situation to an eighty-six per cent staff turnover during the previous year; he found the hospital to have a severe nursing shortage while existing staff was “very, very seriously overworked.”⁵⁰ He also blamed the rapid expansion of facilities and services following the war, a shortage of interns and an inexperienced student work force unable to keep up with expanded demands for increasingly technological care. Over the next two decades, OCH administrators worked at finding solutions which would produce more graduate nurses, retain those in practice, and restructure nursing roles of those already employed.

The ability to attract students into training and to retain nurses in practice reached critical levels during the 1950s and 1960s as women were offered more career choices. Nurse leaders sought to reconstruct the profession’s public image during this period; they abandoned Victorian ideals of femininity that predominated in nursing school cultures in the hope of attracting young women into the profession.⁵¹ Training schools began to offer student nurses social and leisure opportunities similar to those other young women might expect to enjoy.

Reflecting these trends, the OCH’s school of nursing introduced new social activities in addition to curriculum changes in 1957 and 1967 that reduced the overall training period. For example, the school sponsored a basketball team that competed with other girls’ teams in Ottawa, held school dances and parties, established student councils and published annual school year books. Another significant recruitment and retention strategy was to lift the marriage ban in 1965, not only to encourage students to complete their training, but to allow also those who had married and dropped out previously, to return and complete their training.⁵² These “refresher” courses were popular throughout North America as a means to update skills for nurses who wanted to return to work.⁵³ Seventy-seven nurses, who had trained between 1926 and 1954, returned to take the first OCH refresher courses, completing them in 1960. These endeavors were partially successful in increasing the number of graduate nurses in hospital work; however, the Ontario provincial government decided in 1970 to close hospital training programs and move nurses’ training to educational institutions, thus escalating the rate of change even further. The OCH had to hire more than four hundred nurses

50. “Civic Hospital,” 673.

51. McPherson, *Beside Matters*, 189.

52. Hospital annual reports, photographs, and the alumnae association newsletters document these activities. See also, “Fisher’s Folly,” *A History of the Ottawa Civic Hospital, 1924-1984* (Ottawa: Banfield-Seguin Ltd., n. d.), 27.

53. Elizabeth Worley, “Monsters, Monitors, and the Merry Mouseketeers,” *American Journal of Nursing* 69, 7 (1969): 1445.

at this time, effectively completing the shift in nursing care from a student workforce to a graduate nurse workforce.⁵⁴

These combined influences shaped a different type of workforce, one based on a critical mass of experienced nurses who would remain in the profession to build long-term careers. As OCH nurse and educator Gwen Hefferman pointed out, this generation of nurses believed that medical technology was “rooted in the practice of nursing [...] It’s not just 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.”⁵⁵

Differentiating Nurses: Professionals or Technicians?

Delegation was intended initially to solve certain problems associated with the increased use of medical technology, such as changing diagnostic and treatment capabilities, while stretching the available hospital human resources as far as possible. It was not intended to divide nurses into categories as “professionals” and “technicians,” and distinguishing among rank-and-file nurses according to their technological skills. But it did both, exacerbating ideological differences between nurse leaders and bedside nurses, and even splitting rank-and-file nurses according to their technological skills.

North American nurse leaders laid claim to a body of knowledge distinct from medicine by the early 1900s, but it remains unclear where medical technology fitted in relation to nursing science. Early leaders focused their efforts on establishing professional organizations, standardizing educational requirements, establishing journals, and lobbying for registration/licensing laws. American leaders such as Annie Goodrich, Lavinia Dock and Lillian Wald made it clear that “the mechanics of nursing and the profession of nursing were distinctly different.”⁵⁶ As late as the 1960s, many nurse theorists still supported the view that “learned professions and technical work were incompatible.”⁵⁷ Advancement in the

54. OHAR, 1960; “Wives Going Back to Nursing: Unique Refresher Course at Civic Hospital,” unidentified news clipping dated 1960, OCHA; Valerie Knowles, *Leaving with a Red Rose: A History of the Ottawa Civic Hospital School of Nursing* (Ottawa: Deneau Publishers and Company Ltd., 1981), 178-184.

55. Hefferman interview.

56. Hamilton, “Constructing the Mind of Nursing”: 7 and note 33. Excellent analysis of professionalization movements is found in Barbara L. Brush and Joan E. Lynaugh, eds., *Nurses of All Nations: A History of the International Council of Nurses, 1899-1999* (Philadelphia: Lippincott, 1999).

57. Joy Louise Johnson, “Toward a Clearer Understanding of the Art of Nursing,” PhD thesis, University of Alberta, 1993.

profession typically required nurses to distance themselves from the bedside and move into supervision, administration or education.⁵⁸

But rank-and-file nurses had always valued the acquisition of technological skills and knowledge, and as McPherson suggests, skills were central to their collective sense of self.⁵⁹ Each OCH student nurse had a little “blue book” of competencies, referred to as a “little shopping list of skills” by one student, to be signed off by their supervisors as they mastered each one. Nurses interviewed for this study accepted technological roles for different reasons, depending on the time frame. During the 1940s, “they were told to do it, and they did it.” In the 1950s, “there wasn’t anybody else to do it.” By the 1970s, nurses viewed technological competence as a form of job security, noting that “if we don’t do them, somebody else will.”⁶⁰ None of these nurses felt incapable of working with medical technology. Margaret Henricks, who nursed at the OCH during the 1950s, perceived the delegation of medical technology as a workload issue and not as an inability to cope with either science or technology: “[Technology] was something beyond the scope of what the nurses could *handle*--not what they could *do*, but what they could *handle* with the workload [...] As time went on, we realized we had to take care of the patient in a holistic way.”⁶¹

Some nurses parlayed the acquisition of technological skills into long-term hospital careers, creating practice expertise and occupational space there. No longer were all nurses considered to be identical with respect to skills and responsibilities. Delegated skills established a new hierarchy between nurses who subsequently became known as “general duty nurses” and those who worked in the emerging specialized practice environments of the 1950s and 1960s, where technological competence was paramount. Some hospitals contemplated differential pay for nurses employed in such areas that required added skills and responsibilities. As one OCH nurse observed: “You always knew [technological skills] would get you in the critical care areas because critical care areas are about machines and equipment.”⁶²

58. Melosh offers an excellent analysis of nursing work culture and the tensions between the leadership’s quest for professional power and the rank-and-file’s efforts to maintain control in “*The Physician’s Hand*,” 160-183.

59. McPherson, *Bedside Matters*, 74.

60. Hefferman, Henricks, Simister and Nicklin interviews.

61. Henricks interview.

62. Kathy Slattery, audio-taped interview with author at Ottawa, 10 February 1998. See also, City of Regina Archives, Regina General Hospital, 1947-1974, Board of Governors Minutes, COR-002-00377.

These emerging specialty units challenged nurses with 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 drainage tubes. Here, nurses enhanced their vocabulary as “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 [became] terms familiar to [them].”⁶³ As OCH Emergency Room nurse Kathy Slattery recalled: “Nurses always liked skills and psychomotor tasks. It felt like they were getting into the physician’s 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.”⁶⁴

According to a 1974 article in the *American Journal of Nursing*, nurses had little competition as care providers and benefited from “the power that accrues to persons or groups who are essential to the maintenance and functioning of a system.”⁶⁵ As long as a limited number of nurses could perform a specific delegated act, they enjoyed enhanced autonomy and status within the nursing work culture. For example, OCH nurse Donna Martin was a member of the intravenous team who recalled that she was forced to resign from her position on the team with each of her pregnancies. But the hospital always re-hired her when she was ready to return to work because “there were never enough experienced nurses.” Although she lost seniority through these cycles of resigning and re-hiring, she gained some measure of control over her work life based on her technological competence. But the increasing use and standardization of delegated acts resulted in these technologies becoming part of everyday nursing practice, with a loss of any associated special status or privilege.⁶⁶

Although delegated skills and technological competence provided increased job security for some nurses, others felt forced away from bedside practice—undervalued by a nursing leadership that seemed unable, or unwilling, to capitalize on emerging practice expertise. The OCH, for example, experimented with the clinical nurse specialist role during the early 1970s, hiring Wendy Nicklin for the Emergency Department. Reflecting on her two years in this position, Nicklin stated, “It was a shame the role ended when it did, you know, because I really

63. Donna Zschoche and Lillian E. Brown, “Intensive Care Nursing: Specialism, Junior Doctoring, or Just Nursing?” *American Journal of Nursing* 69, 11 (1969): 2373.

64. Slattery interview.

65. Katherine B. Knuckolls, “Who Decides What the Nurse Can Do?” *Nursing Outlook* 22 (1974): 627.

66. Martin, personal communication.

didn't want to leave.... There was a review of positions done here at the hospital...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.' I said, 'No, I want to be more involved in patient care and influencing practice....' I have always looked back and thought, 'You never know what your career might have been, eh?'"⁶⁷

Thus delegation both fostered and constrained the development of nursing practices. The success of nurses who remained at the bedside and became highly skilled in medical technology led hospitals to hire an increasing number of graduate nurses. Some of them were able to create occupational spaces at the bedside, including specialty units, but others felt stifled by a medical and nursing hierarchy that did not know how to capitalize on their developing skills and knowledge.

This case study of nurses in one hospital setting exemplifies how the nursing profession struggled with issues related to medical technology and boundaries of practice throughout the twentieth century. While their leaders debated what constituted legitimate nursing practice, rank-and-file nurses dealt daily with the increasingly technological care of patients—incorporating, resisting and shaping bedside practice through everyday body work. Delegation from physicians was one impetus that partially shaped *what* nurses did as well as *who* did nursing work during the mid-twentieth century. Gender, body work and medical technology thus intersected to construct hospital nursing in ways that both facilitated and constrained the development of nursing science, while shaping how nurses engaged with science.

67. Wendy McKnight Nicklin, audio-taped interview with author, Ottawa, 21 April 1998.