DATA SHARING LEADS TO PATIENT CARING?: GENDER, TECHNOLOGY AND NURSES' CARING WORK

by

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Data Sharing Leads to Patient Caring?: Gender, Technology and Nurses' Caring Work

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Abstract

This thesis reports the results of research about the relationships among gender, technology and nurses' caring work which are explored in relation to a Patient Care Information System (PCIS). From a feminist standpoint it examines how nurses use and perceive technology in their professional practice. Qualitative research was conducted in the Emergency Department (ED) at Vancouver General Hospital (VGH). Data were collected through interviews with nurses and extensive observation in the ED. Grounded theory, Francophone feminist ergonomics, and feminist approaches to research and interviewing provide the thesis' methodological foundation.

PCIS is a hospital-wide computer system used by staff to enter and track patient information. The title of this thesis, "Data sharing leads to patient caring," refers to PCIS, and represents a vision of healthcare founded on the introduction of new technologies, leading to processes of rationalization and greater scrutiny of workers. This vision of healthcare stands in contrast to the way nurses define care on the basis of the formation of embodied caring relationships with individual patients.

The thesis asks four questions. First, does using PCIS to share data facilitate patient care? Second, how do nurses interact with PCIS in the act of caring for patients? Third, how does PCIS fit into nurses' broader understanding of technology's role in the delivery of patient care? Finally, how does gender shape nurses' perceptions of caring and technology?

I argue that nurses at VGH define care, and the relationships between caring and technology in their professional practice, in

opposition to the organizational vision of caring represented by the phrase "data sharing leads to patient caring." This is an act of resistance by women workers in a feminized profession to a gendered political economy in care that simultaneously devalues their caring work, renders much of it invisible, and subjects what remains to processes of rationalization and technological scrutiny.

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Chapter One
Introduction

The phrase "data sharing leads to patient caring" comes from a mouse pad found in the Emergency Department (ED) at Vancouver General Hospital (VGH). The mouse pads were distributed throughout the hospital to promote use of its Patient Care Information System (PCIS). PCIS is a hospital-wide computer system used by staff to enter and track patient information. The system figures prominently in the pages to follow, for my thesis is based on field research conducted in the ED at VGH and examines from a feminist perspective how nurses use and perceive technology in their work.

In this chapter, I will briefly review the literature relevant to my research. I will discuss the rationale for choosing this project and will then outline its guiding research goals and questions. My research will be situated in relation to the larger, federally-funded study that facilitated this project. I will then discuss the significance of my research. Chapter One concludes with an overview of the structure and content of my thesis.

Brief review of literature

Women and men's labour is sexually divided (Kramarae & Spender, 2000). The assumption that women are 'naturally' suited to caring work is founded on this hierarchical sexual division of labour (Finch & Groves, 1983; see also Baines, Evans & Neysmith, 1991; Cancian & Oliker, 2000). Women are responsible for caring work in the home and in the workplace. Since caring is perceived to be an inherently 'feminine'

quality, it is thought to require little skill (Diamond, 1988; Phillips & Taylor, 1980). Women's caring work is undervalued and often invisible (Graham, 1983).

Nursing is a feminized "caring profession" (Graham, 1983; Kessler-Harris, 2003). It is a type of women's work fundamentally associated with care (Gaut, 1992; Gaut & Boykin, 1994; Reverby, 1987). Though integral to ensuring successful patient outcomes, nurses' caring work often does not receive the symbolic or economic recognition it deserves (Navarro, 1993). In the sexually divided hospital hierarchy, the work of male physicians is assigned greater prestige than that of female nurses (Ashley, 1976; Gamarnikow, 1978). Nurses' caring work is embedded in a gendered social and political economy (Daly & Lewis, 2000). Their work is systematically undervalued, ensuring the perpetuation of a cheap yet essential labour force (Doyal, 1995).

Nurses have always used a range of technologies in their work, and they must contend with the masculinization of technology in addition to the feminization of caring work (Wajcman, 1991). Women are perceived to lack technological competence because technology is implicated in a gendered division of labour (Bush, 1983; Cockburn, 1985a, 1985b, 1991; Cockburn & Ormrod, 1993; Wajcman, 1991). Because of this, when women work with technology, their work is deemed 'unskilled' (Webster, 1996). Despite technology's utility in the provision of healthcare, nursing has a complex relationship to technology. At different times, the profession has turned both to and from it (Sandelowski, 2001). This shifting relationship is linked to how nursing defines itself in relation to technology.

The relationship between nursing care and technology is of particular concern as the healthcare system faces a mounting burden of care due to factors such as population aging. Nursing exists within a political economy of healthcare increasingly characterized by frozen or reduced funding and a growing demand for care, as well as processes of rationalization and privatization (Armstrong et al., 1997; White, 2003).[1] In this context, technology is perceived by policymakers and other influential actors to be a cost-effective means to facilitate the efficient delivery of care (Balka, 2001). As a result, nurses are employed in an increasingly high-tech environment in which they face greater scrutiny as a consequence of more precisely managed care (Bowker & Star, 1999; Malone, 2003).

The introduction of new technology in healthcare settings is not always successful (Balka, 2001; Novek, 2002). Poorly designed or inappropriate technologies can be a hindrance to work practice, particularly as they impose on nurses a greater burden of administrative work (Choiniere, 1993). Nurses cope by resorting to workarounds (Novek, 2002; Sharman, 2003a), sticking to old routines (Choiniere, 1993) and launching union challenges (Balka, 2001). They also resist by affirming a vision of care based on emotional and physical proximity to patients (Malone, 2003), a strategy I will emphasize in Chapter Four as I discuss how nurses at VGH define caring.

In nursing, the relationship among caring, technology and

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[1] For a detailed overview of trends in Canadian healthcare funding, see *Health Care in Canada* (2003) or *Health Expenditures in Canada by Age and Sex, 1980-81 to 2000-01* (2001).

professional practice is shaped by a complex interplay of gender relations. This gendered relationship has economic consequences. It affects how we define and understand nurses' caring work. These issues will be described in greater detail in Chapter Two.

Research goals and questions

My interest in this topic emerges from an ongoing commitment to intellectual and political engagement with women's issues, particularly as they pertain to women's work. I took the opportunity to conduct research in the ED at VGH because it was a means to examine firsthand the realities of women's work in a feminized profession. As I delved into the relevant literature, I developed a keen interest in the power relations underlying the relationships among nursing, technology and caring work. When I recognized PCIS as a site of convergence for these relationships, it became the focal point of my thesis.

Vancouver General Hospital's PCIS is an electronic patient record system used by hospital staff to enter and track patient information. The hospital has not made the transition to a completely electronic system because it lacks the funds and technical capacity to do so. As such, the hospital keeps both paper and electronic medical records. Nurses in the ED at VGH routinely use the system in their work practice, as hospital policy requires that they enter certain information about every patient under their care. Nurses also use the system for information retrieval (e.g., to locate patients on different wards) and management of care (e.g., to allocate beds to patients on the basis of acuity). These practices are described in detail in Chapter Four, where I discuss how nurses use and perceive PCIS.

The system emerged in a Canadian context of healthcare funding and delivery increasingly centred on the application of technological solutions to healthcare's problems (Balka, 2001). PCIS is controversial for a number of reasons, including because the system's implementation at VGH is the consequence of a contentious public-private partnership between the hospital and BC Tel (now Telus), the provincial telephone company (Balka, 2001). The system is further criticized for being poorly designed and inappropriate to users' needs (Balka, 2001; Sharman, 2003a). PCIS, like other systems designed to manage work and classify patients (e.g., through designation of their acuity), subjects users to greater scrutiny and burdens them with an increased administrative workload. Using Malone's (2003) contrasting notions of "distal" and "proximal" nursing as a reference point, I argue that PCIS represents a rationalized vision of healthcare antithetical to nursing's traditional focus on direct, embodied patient care.[2] I elaborate upon this argument in Chapter Four.

In my thesis, a discussion of PCIS vis-à-vis the issues outlined above serves as the gateway to an exploration of the relationships among caring, technology and gender in nursing. While these themes have been discussed in the literature briefly reviewed in this chapter, insufficient effort has been made to link caring and technology in a way that captures the intricacies and inequities of the gendered political economy in which nurses' caring work takes place. This is of particular relevance as processes of rationalization shape the priorities of health

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[2] "Distal" and "proximal" nursing are defined and discussed at pp. 26-28.

administrators and policymakers, who look more frequently to technology as a solution to healthcare's problems.[3] Bowker and Star (1999), Choiniere (1993), Malone (2003) and Sandelowski (2000) are notable exceptions; I seek to follow their example in my work.

Four research questions guide my thesis. The first is an over-arching question and serves as an entry point to three sub-questions. The sub-questions are structured in such a way as to move from the specifics of work practice to nurses' perceptions of their work, and culminate in an examination of how both are shaped by society's broad gender relations.

1. Does using PCIS to share data facilitate patient care?
    i. How do nurses interact with PCIS in the act of caring for patients?
    ii. How does PCIS fit into nurses' broader understanding of technology's role in the delivery of patient care?
    iii. How does gender shape nurses' perceptions of caring and technology?

In order to answer these questions, this thesis reports the results of research conducted about nursing and technology in the Emergency Department at Vancouver General Hospital. My findings are discussed in detail in Chapter Four.

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[3] I use the term "rationalization" in the Weberian sense; that is, as a critique of capitalism and the related "spread of bureaucracy, state control and administration" (Abercrombie, Hill & Turner, 2000, p. 290).

Situating the research

The research for my Master's thesis was conducted as part of a larger project funded by the Social Sciences and Humanities Research Council of Canada (SSHRC).[4] The project is entitled "From Work Practice to Public Policy: A Case Study of the Canadian Health Information Infrastructure" and is supervised by Dr. Ellen Balka. It spans multiple research sites, including Vancouver General Hospital's Emergency Department and Intensive Care Unit, and builds on partnerships with hospital management and the British Columbia Nurses' Union (BCNU), as well as other community partners. Research is ongoing, and the SSHRC-funded project has as its goal "the development of an integrated conceptualization of power in relation to technology" (Balka, 2000, p. 6). The project is "designed to provide new information about issues of policy and practice associated with the development of the health info-structure" (Balka, 2000, p. 1). It brings together multiple perspectives on technology and work, and is intended to link work practice issues with broader organizational and institutional contexts.

Significance of research

The significance of my research lies in the need to articulate more fully the relationships among gender, technology and nurses' caring work. As healthcare administrators and policymakers increasingly turn to technological solutions, we must consider the effects of these

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[4] Financial support for this research has been provided by the Social Sciences and Humanities Research Council of Canada, under grant # 410-2000-1096.

technologies on work practice. Nurses' perceptions of, and experiences with, technology shape how they use it. An inappropriate or poorly designed technology is a hindrance to the delivery of care. The relationship among nursing, technology and care also has implications for the future of nursing as a profession. The rationalization of healthcare means that nurses are increasingly being forced to account precisely for what they do and technology often figures into this process (Bowker & Star, 1999; Campbell, 1994). I argue that nurses must ensure they are able to use technology to enable care in such a way that does not compromise their autonomy or professional identity, though proponents of the rationalization of healthcare and related control over work processes may hold otherwise.

My research is also more widely applicable to the experiences of other women workers in the caring professions, a field that will surely grow as our population ages and the number of individuals in need of care expands (Daly & Lewis, 2000). Caring work is a form of women's work, and it is both devalued and vitally important to the functioning of our society (Finch & Groves, 1983). Why does this contradiction exist, and what does it mean in an era characterized by funding constraints and a growing need for care? How will technology shape the future of caring work? Although I cannot answer these questions in my thesis, I will present the experiences of caring workers in one high-technology workplace in the hope that it may serve as both a contribution and an entry point into research about these important issues.

Outline of thesis

In the next chapter (Chapter Two), I will provide an overview of the

literature relevant to my topic. I will identify the literature's major themes, as well as highlight the need to link caring and technology in a way that captures the complexity of the gendered political economy in which caring work takes place. The chapter begins by situating care within the broader category of women's work. Caring work is feminized and therefore undervalued; this has implications for nursing as a caring profession. Chapter Two articulates the relationship between a wider gendered political economy and the feminization of nurses' caring work. It highlights current processes of rationalization and how they affect nurses' ability to care autonomously for patients. The chapter also discusses the masculinization of technology and how it affects perceptions of technological skill. An overview of the complex relationships between nursing and technology sets the stage for a description of various accounts of technological change in healthcare, including the origins and implementation of PCIS. This chapter provides a rationale for the feminist research methods described in Chapter Three and establishes an intellectual basis for the findings discussed in Chapter Four.

Chapter Three is a description of the research methodology I followed conducting feminist qualitative research for this thesis. The chapter contains a detailed overview of the process of data collection and analysis. It begins with a discussion of the three qualitative research methods underpinning my work: grounded theory, Francophone feminist ergonomics, and feminist approaches to research and interviewing. Chapter Three details the procedures I followed in conducting observation of and interviews with nurses in the ED at VGH. It describes some of the challenges and unique characteristics of feminist qualitative

research. The chapter concludes with an overview of the process of data analysis, for which I used NVivo 2.0, a type of qualitative research software designed specifically for research conducted according to the tenets of grounded theory. Chapter Three provides the practical grounding for the research discussed in Chapter Four.

In Chapter Four, I present the findings of my research about gender, technology and nurses' caring work. The chapter establishes a distinction between administrative technologies like PCIS and clinical technologies like heart monitors. This distinction is fundamental to how nurses use and perceive technology. PCIS represents a particular organizational vision of the role of technology in healthcare. This vision stands in opposition to nurses' definition of caring as a form of embodied, human interaction based on proximity between nurse and patient (Malone, 2003). By examining how nurses use PCIS and how they cope with technological malfunctions, Chapter Four establishes nursing's complex relationship to technology. The chapter draws from observation and interviews with nurses in order to articulate a particular vision of care founded on the distinction between caring and technology. I identify this vision of care as an act of resistance to rationalized healthcare and conclude by locating nurses' caring work in a broader gendered context shaped by the feminization of care and the masculinization of technology. Chapter Four expands upon the issues discussed in Chapter Two and is intended to answer the research questions guiding this project.

In the fifth and final chapter of this thesis, I summarize and draw conclusions based on my research findings. It is a synthesis of the argument woven through the preceding four chapters. I argue that

nurses at VGH define care, and the relationships between caring and technology in their professional practice, in opposition to the organizational vision of caring represented by the mouse pad's message. This is an act of resistance by women workers in a feminized profession to a gendered political economy in care that simultaneously devalues their caring work, renders much of it invisible, and subjects what remains to processes of rationalization and technological scrutiny.

Chapter Five also contains an overview of possible directions for future research and some reflections about the research process. The chapter is a rearticulation of the significance of this research for our understanding of women's work and the role of technology in healthcare. My research has broad implications for the experiences of women working in the caring professions, for my aim is to call attention to the gendered power relations that render their work invisible and undervalued. My research is additionally significant in that it may offer an entry point into scholarship on other facets of the experiences of women working with technology in healthcare, such as admitting clerks and diagnostic technicians.

Chapter Two
Literature Review

A diverse body of scholarship addresses aspects of the relationships among gender, technology and nurses' caring work. This chapter synthesizes feminist literature about women's work and technology; scholarship about nursing from inside and outside the profession; gendered analyses of the political economy of health; and accounts of technological change in healthcare. Through a synthesis of these literatures, Chapter Two sets the stage for the description of my research design and methodology found in Chapter Three. It also establishes the appropriate scholarly context for the findings to be discussed in Chapter Four.

Chapter Two opens with a discussion of the sexual or gender division of labour and the construction of women's work. It identifies caring work as a form of feminized labour that has particular consequences for nursing. Chapter Two locates nurses' caring work within a gendered political economy that devalues nurses' work, deems it unskilled and renders it invisible. Skill also figures in the ensuing discussion of the masculinization of technology, as it shapes how nurses and others define their work. This is followed by an overview of the complex nature of nursing's relationship to technology, for nurses have turned both to and from technology in the articulation of their professional identity. The chapter concludes by comparing accounts of technological change in healthcare organizations, with specific reference to PCIS' origins and implementation.

Women's work

Women and men do different work. This is referred to as the sexual or gender division of labour, a division that occurs both within and outside the home.[5] The sexual division of labour "involves 'women's work' and 'men's work'," a partition of tasks by gender justified "on culturally defined so-called natural differences based on sex" (Kramarae & Spender, 2000, p. 399). It is predicated in part on the public/private divide, a gendered construct dating back to ancient times and often challenged by feminist scholars (Elshtain, 1993). An inherently problematic construct, "the antinomy private/public is another expression of natural/civil and women/men" (Pateman, 1988, p.11). This set of oppositions rests on a masculine ideal that gains substance through "the subjection of women within the private sphere" (Pateman, 1988, p. 11). The public/private divide assumes that

> women's "natural" place is in the home...[It] seeks to legitimate women's exclusion from the public sphere and hence the workplace and implies that a woman who is committed to her job is unwomanly...The assumption that women's place is in the home follows from the premise that men support women, so women do not need to do wage work to earn a living. By implication, if women are employed, it must be for extras or diversion from domestic life, so their concentration in low-paying, dead-end jobs is of little importance. (Reskin & Hartmann, 1986, p. 38)

As a consequence of the public/private divide, women who do paid work outside the home are faced with a double burden. In addition to the responsibilities of their paid work, many women also "continue to bear

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[5] Sex "refers to the biological distinction between females and males," while gender "refers to the socially constructed and socially expected differences between men and women" (Kramarae & Spender, 2000, p. 900).

the responsibility for the children and the household" (Connelly, 1978, p. 5; Luxton, 1980). Women are paid less than men and do more domestic work than men do, regardless of whether or not they are also engaged in paid work outside the home (Armstrong & Armstrong, 1984).

Occupations are segregated by sex because of gender relations within the family and gendered economic processes in the sphere of employment. As Webster (1996, pp. 20-21) explains,

> The sex-typing of jobs as appropriate for women, and their association with particular gender characteristics, derives not only from women's reproductive role within the domestic sphere, but is also the upshot of processes taking place within the sphere of employment itself. Women's jobs have become sex-typed through persistent historical employment discrimination crystallized into jobs.

Women's work is frequently devalued or rendered invisible and is often perceived to be unskilled (Phillips & Taylor, 1980). Occupational sex segregation is a further consequence of women's position within the labour force. Largely as a result of the assumption that women are financially supported by men, women are recruited "into a limited number of occupations consisting of low-paid, low-status jobs" (Magill, 1995, p. 1186). Kessler-Harris (2003, p. 358) calls this a "pink collar ghetto." Women working in the paid workforce are clustered in particular occupations, including "teaching, nursing, clerical, and service work" (Cohen, 1994, p. 111). A preponderance of women working in the pink collar ghetto are in caregiving occupations (Kessler-Harris, 2003, p. 359), a type of work discussed further in the following section.

Caring work

Caring work comprises a significant part of women's work (Finch & Groves, 1983; see also Baines, Evans & Neysmith, 1991; Cancian &

Oliker, 2000). Like all women's work, it takes place both inside and outside the home, and is both paid and unpaid. Both women and men are capable of caring for others, but women's perceived aptitude for caring means that it has "particular consequences for the identity and activity of women" (Graham, 1983, p. 14). This is due to a combination of economic and social factors, and is shaped by women's ability to bear children and the related sexual division of labour. As a result of their 'natural' characteristics, it is assumed that women are more adept at caring. This is, however, a problematic notion:

> The notion that caring comes "naturally" to women fails to consider the significance of the socially patterned roles and the processes of socialization through which sex is translated into gender as women and men learn to incorporate into their behaviour and attitudes, assumptions related to masculine and feminine roles. Important dynamics differentiate the socialization of girls and women from boys and men. It is women who learn to take their place in society as informal caregivers to children and elderly relatives, and who transfer this to the public sphere and provide formal caring services as cleaners, child-minders, and teachers. Unlike their male counterparts, females are encouraged to identify with others and to develop altruistic patterns of interaction. (Noddings, 1984, as cited in Baines et al., 1991, pp. 17-18)

Consequently, caring "has played an important role in shoring up the ideology of gender difference" (Fisher, 1995, p. 8). The sex-typing of caring work is predicated on an ideology of gender difference that feminizes nurturing and altruism and makes them almost the exclusive preserve of women. Women are given responsibility for paid and unpaid caring work, inside and outside the home. A mother who cares for her children may also work as a nurse, teacher, or nursing home attendant. For women, caring has a "dual nature...as labour and as love" (Graham, 1983, p. 16).

'Caring professions': The economics of care

Caring, as labour and as love, has important economic dimensions. Baines et al. (1991, p. 12) observe that caring work in the home is "unpaid and undervalued; in the workplace it is poorly paid and undervalued." The literature on caring work reveals that women shoulder the double burden of responsibility for paid and unpaid caring work (Finch & Groves, 1983). The economy depends upon women's unpaid caring work – for example, through the labour of women who care for their children or elderly relatives, as well as perform the reproductive labour (cooking, cleaning, etc.) required to maintain a family. The economy also depends upon women's paid caring work, in particular the work of women in the "caring professions," which include "nursing, social work and primary school teaching" (Graham, 1983, p. 16). An example of occupational segregation by sex, this is women's work writ large, for women working in the caring professions "become involved in housekeeping tasks on behalf of society at large" (Adams, 1971, p. 558, as cited in Graham, 1983, p. 16).

There is a relationship between paid and unpaid caring work. Women's productive and reproductive labour "are part of the same whole. And that whole is gendered" (Armstrong, 2001, p. 125). Armstrong (2001, p. 125) stresses the need to recognize "the integral link between formal and informal care," as exemplified by women's varied and differently remunerated roles in the provision of health care. As such, we must conceptualize care "in such a way as to capture the social and political economy in which it is embedded" (Daly & Lewis, 2000, p. 284). Political economy has varied meanings; it can refer to a method, a theory,

or the framing of a research question. In my thesis, I refer to political economy as the context in which caregiving takes place. Like Daly and Lewis (2000), I seek to situate care in a gendered political economic context. In doing so, I seek also "to connect the everyday moments of women's lives back to the structural level of capitalism" (Riordan, 2002, p. 4). Women's caring work must be embedded in a wider political economy underscored by relations of inequality and domination. This affects how women's work is defined, perceived, and valued.

The effects of caregiving's gendered political economic context are particularly evident in healthcare, as Armstrong suggests. Constrained funding and access to services such as home care, coupled with social expectations about women's 'natural' propensity for caring, mean that women are largely responsible for the unpaid care of sick or elderly family members. Many women today are part of the so-called "sandwich generation," simultaneously caring for their children and aged relatives (Aronson, 1991; Blakely, 2002). This is, in part, a consequence of the expectation that women will always step in when and where care is needed. Women working in healthcare, as nurses, nurses' aides, admitting clerks or hospital cleaners are subject to a similar set of gendered expectations. These are feminized occupations. The women working in them are assigned a marginal place in healthcare's hierarchical sexual division of labour (Gamarnikow, 1978). Ashley (1976, p. 17) refers to this as the "hospital family," a paternalistic hierarchy that places (male) physicians at the top and women from the various feminized professions in subordinate positions. This hierarchical distribution of status and power must be situated within a wider sexual or gender division of labour, as described in the literature on women's

work summarized above. The gendered political economy in which caregiving takes place is evidence of a society that relies upon, yet systematically undervalues, women and their work.

Ordered to care: Nursing as women's work

Gamarnikow (1978, p. 109) argues that the "genderization" of the nurse-doctor relation is achieved "by establishing an ideological equivalence between two sets of relations, nurse-doctor and female-male." As a type of women's work historically associated with an altruistic 'feminine' ideal, the profession of nursing has a particularly complex relationship to caring. Susan Reverby (1987, p. 1) suggests that, as women workers in a feminized profession, nurses are "ordered to care:"

> Nurses, as do others who perform what our society defines as 'women's work', have always contended with the dichotomy between the duty and desire to care for others and the right to control and define this activity...Nursing as work is thus based on our expectation and need for someone to take up the obligation to care.

Care and caring relationships have material as well as symbolic dimensions (Graham, 1983, p. 16), and the history of professional nursing is a story of the transition from unpaid caring work in the home to paid caring work in private duty and in hospitals.[6] The feminization of caring played a significant role in facilitating nurses' initial movement from work in the private sphere of unpaid labour to the public sphere of paid labour:

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[6] For a discussion of this transition and the gendered history of nursing, see, for example, Davies (1980), Lagemann (1983), McPherson (1996), Reverby (1987), and Roberts & Group (1995, 2001).

> Caring, couched in terms of qualities understood as natural – qualities that could jump from the private to the public sphere without threatening the identity of their bearer – has been vital to important transitions for women. While remaining pivotal to women's identity, caring took women from the home to nursing in the paid labour force. (Fisher, 1995, pp. 9-10)

Nursing shares with other caring professions the capacity to allow women to work outside the home with their femininity intact. Women are no longer as tied to home and hearth as they once were, nor is it feasible for many families to subsist on a single income. Nevertheless, the sex-typing of jobs means that certain professions – mechanic or computer programmer, for example – present a greater challenge to a woman's gender identity than others. By doing work that conforms to feminine norms, women working in caring professions do not disrupt the existing gender order.

Men working in these professions, on the other hand, present a challenge to the masculine ideal. Women who "cross over" into traditionally masculine occupations are "subject to suspicions that they are not 'real women'," and the man who "crosses over into a female-dominated occupation upsets [the] gender assumptions embedded in the work" (Williams, 1993, p. 3). Nursing exemplifies this tension, for men working in the feminized profession "strive to redefine their professional identity to suit the masculine gender" (Kauppinen-Toropainen & Lammi, 1993, p. 99). In order to accomplish this, men who work as nurses

> specialize in work tasks in which they minimize the need for direct interaction with patients; the men specialize in anaesthesia, emergency room, or intensive care nursing, where they work as experts on technical machinery, not as primary caregivers. (Kauppinen-Toropainen & Lammi, 1993, p. 107)

Though they do what has been traditionally defined as women's work, men who work as nurses masculinize their professional practice. Kauppinen-Toropainen and Lammi's observation that male nurses align themselves with technical expertise rather than caregiving is indicative of the gendering of care and technology. I will address gender and technology at a later point in this chapter and will revisit this theme, as well as how it intersects with the feminization of care, in Chapter Four.

At this point, it is sufficient to state that men who work as nurses perceive and experience the profession differently than their female counterparts. This is reflected in recent advice from the American Association of Colleges of Nursing to schools about how to recruit men, "offering suggestions such as advertising in the sports pages and emphasizing the tough image of emergency room nursing" (Sheeran, 2003). It is similarly reflected in male nurses' affiliation with technology, for nursing is an intimate practice traditionally associated with the "profane." Technology allows nurses to "replace or, at least, to mitigate the intense bodily intimacy of nursing with the 'technical' and 'measured intimacy' of medicine" (Sandelowski, 2000, p. 10). Caring is women's territory, marked by physical and emotional intimacy. Nursing is situated in healthcare's sexual division of labour, yet there is also a sexual division of labour within nursing based on the feminization of caring work. As atypical workers in a feminized profession, male nurses benefit from their masculinity, "because qualities associated with men are more highly regarded than those associated with women, even in predominantly female jobs" (Williams, 1993, p. 3). By contrast, qualities typically associated with women, such as a perceived aptitude for nurturing or caregiving, are devalued. Women are "ordered to care," and

the literature on nursing demonstrates that it is they who must contend most frequently with the consequences of their profession's gendered expectations and inequities (Witz, 1992).

Gender, skill and the invisibility of caring work

Nursing occupies a particular place in the hospital hierarchy and nurses' caring work, though integral to patient outcomes, often goes unacknowledged. This lack of recognition is, in part, a consequence of what Navarro (1993, p. 111) calls the "dominance of curing over caring:"

> Physicians are trained in curing, with an emphasis on technological intervention. Nurses, on the other hand, are trained in caring – in taking care of patients. Because relationships in the health sector reproduce the dominant class and gender relations in the larger society, curing by white upper-middle-class males becomes more prestigious than caring, the function carried out by lower-middle-class females.

Though most diseases are chronic, "for which the appropriate intervention is caring," it is unlikely that this hierarchical relationship will change, for such a change "would go against the class and gender power relations in our society" (Navarro, 1993, pp. 111-2). The inequities Navarro describes are, as he suggests, not unique to the health sector. Rather, the feminization and devaluation of caregiving are evidence of "women's position within a particular kind of society in which the twin forces of capitalism and patriarchy are at work" (Graham, 1983, p. 25). As a form of women's work, nursing must be situated within a broader gendered political economy (Daly & Lewis, 2000; Doyal, 1995).

To locate care within such a political economy is to highlight the apparent contradiction between our dependence on this kind of work and its invisibility and associated devaluation. Moreover, it is to identify

caring as a form of women's work, bound up in socially constructed ideals of duty and femininity. Caring is big business, and paid caregiving (in hospitals, nursing homes and daycares, for example) is an industry for which there is growing demand, as "practically all welfare states are experiencing a crisis of care as a result of population aging and the decreasing availability of private unpaid care" (Daly & Lewis, 2000, p. 291). Big business profits from care through privatization and the establishment of private-public partnerships, as is particularly evident in the healthcare sector (Armstrong et al., 1997; Cancian & Oliker, 2000). At the same time, the burden of caregiving consistently falls to women, in the home, the workplace, and the voluntary sector (Esteves, 2002). Our society could not function without women's caring work, yet in terms of prestige and financial gain, women do not necessarily reap the rewards of their labour.

This is partly because caregiving is a form of invisible work. As with women's work in the home, caring is "a 'covert' aspect of nursing" and thus "remains persistently difficult to see" (Sandelowski, 2000, p. 11). Caring is so difficult to see in part because it is a type of articulation work, which Sandelowski (2000, p. 172) defines as "the invisible task that is the counterpoint to the routine that allows the routine to be achieved naturally." While a caregiver experiences the physical or emotional toll of her caring work in a most tangible way, the outsider may fail to grasp its magnitude or disregard it entirely. Like much of the work women do, nursing is thought to draw from a seemingly inexhaustible well of 'natural' feminine caring ability. It is common, unremarkable, and a type of work that becomes widely visible only when it is done poorly or not done at all:

> Caring is thus experienced as an unspecific and unspecifiable kind of labour, the contours of which shift constantly. Since it aims, like so much women's work, 'to make cohesive what is often fragmentary and disintegrating', it is only visible when it is not done (Adams, 1971, p. 559; Graham, 1982). (Graham, 1983, p. 26)

Star and Strauss (1999, p. 12) assert the "importance of context in analyzing the visibility of work." There is no singular definition of work. Rather, definitions of work are context-bound; their application and reproduction depend on the power of the definer. Nurses have a rich and embodied understanding of the complex nature of their work, yet this understanding does not generally travel beyond their profession's boundaries. As women workers in a healthcare setting, nurses "are quite visible, yet the work they perform is invisible or relegated to a background of expectation" (Star & Strauss, 1999, p. 15).

The visibility of, and value attributed to, nurses' caring work is linked to perceptions of the skill required to perform it. As definitions of skill are "gender-biased," whether we 'see' a task and how we value it depends to some extent on the nature of the work and the worker herself (Sandelowski, 2000, p. 99). Skill is "saturated with sex," and "it is the sex of those who do the work, rather than its content, which leads to its identification as skilled or unskilled" (Phillips & Taylor, 1980, p. 85). Diamond's (1988, p. 48) thoughtful ethnography of his experiences working as a nurse's aide in nursing homes illustrates this point, particularly as he describes how nursing assistants

> are trained in and judged in terms of the performance of physical tasks, like taking blood pressure and pulses, giving bed pans, and turning, showering and feeding patients...Recording tasks on the chart fits them into the overall organizational scheme of things, called healthcare. In terms of this participation, what nursing assistants do is considered unskilled.

Any person who has fed, bathed or taken the pulse of a sick or elderly person is cognizant of the skill necessary to do each task, and Diamond certainly learned this as he conducted his research. As a white man in a workforce comprised largely of women of colour (Diamond, 1988, p. 40), Diamond had a unique vantage point from which to perceive skill. It is a vantage point not shared by most administrators or leaders, however, so this bodywork, this caring work is relegated to the realm of the unskilled. Diamond questions the assignation of this 'unskilled' label and argues that nursing assistants' "caring work is invisible in the language of business and medicine, and is written out of the charts" (1988, p. 48). Definitions of skill are not gender or power neutral, as evidenced by the literature summarized here; in nursing, skill functions not as "an objective entity but [as] an ideological device used to maintain power" (Sandelowski, 2000, p. 114).

Written out of the charts: The rationalization of caring work

Diamond highlights the function of charting in the creation of records of medical work and concomitant definitions of skill. A sign above the nurses' station at one nursing home read "If It's Not Charted, It Didn't Happen" (Diamond, 1988, p. 48). As with the exhortation "Data sharing leads to patient caring," this is a message with ideological implications. It speaks to the systematic erasure from the medical record of caring work largely done by nurses (Berg & Bowker, 1997, p. 528). Articulation work, the traces of which reside in frequently discarded nursing notes or in a patient's body, is not accounted for in a formalized way. This serves to reinforce its invisibility, particularly as funding constraints lead to the rationalization of healthcare. This shift

toward rationalization of work processes in healthcare compromises the quality of care caregivers are able to provide (Armstrong et al., 1997; White, 2003). In nursing, how the hospital organization defines caring is shaped by what is visible and what can be accounted for:

> Medical standards...shape values and rewards in nursing homes and hospitals. They define physical care and monitoring and charting medical information as most valuable. The emotional or interpersonal parts of care become secondary or invisible. Care in the form of talking to patients, holding their hands, validating their dignity and worth is not entered in the charts, required by management or state regulations, or rewarded by a raise. (Cancian & Oliker, 2000, p. 80)

When nurses are expected to account for the content of their work, attention frequently shifts to the tangible aspects of care. In such a context, as Cancian and Oliker suggest above, emotional or interpersonal care becomes secondary or invisible. Rationalization renders invisible certain kinds of work, while making others highly visible. This has consequences for nurses whose caring work gets written out of the charts, in terms of both professional identity and control over the content of their work. Representations of work are not power-neutral. Rather, they are "interpretations in the service of particular interests and purposes, created by actors specifically positioned with respect to the work represented" (Suchman, 1995, p. 58). To negotiate relations of visibility and invisibility is to take on a complex challenge, particularly as nurses seek to maintain their autonomy and enhance their professional legitimacy.

The structure and content of medical charts reinforce a representation of work that does not sufficiently account for caregiving labour. It is a representation shaped by how nurses' work is classified and accounted for. Some nurses are attempting to address this

challenge by designing their own classification systems. These systems are intended to account for nursing care in a way that captures its rich complexity but can also be widely applied in a standardized way. One example is the Nursing Intervention Classification (NIC), a classification system developed by nurses aimed "at depicting the range of activities that nurses carry out in their daily routines" (Bowker & Star, 1999, p. 28). The NIC allows nurses to categorize and describe the various interventions they perform in their work. Through initiatives such as the NIC, nurses seek to

> disembed what has previously been deeply embedded, invisible work done by nurses, and make it visible to the medical record, for research purposes, and for the legitimation and professionalization of nursing. (Star & Strauss, 1999, p. 20)

It is a way to account for caring work, which "often cuts across specific medical diagnostic categories," and to make visible and legitimate the work that nurses do (Bowker & Star, 1999, p. 29). In this way, nurses are negotiating the complex relation between invisible and visible work, a "phenomenon...of tradeoffs and balances, not absolute and clear boundaries" (Star & Strauss, 1999, p. 24).

Other nurses are resisting the rationalization of care by adhering to an oppositional model of professional practice exemplified by Malone's (2003) contrasting categories of "distal" and "proximal" nursing. Malone conceives of hospital nursing as fundamentally founded on direct human interaction between nurses and patients. The rationalization of care compromises this model, however; as a consequence, hospital nursing is

> spatially vulnerable insofar as it depends on a taken-for-granted proximity to patients that is acutely threatened by the localized spatial and power dynamics of macro-originated economic and ideological pressures. (Malone, 2003, p. 2318)

Changes within the health care sector, including "work redesign strategies aimed at reducing costs," "changes in charting and reporting practices," and "an emphasis on abstract classification systems and 'standardization of care'," threaten this proximity (Malone, 2003, p. 2320). The result is a move toward "distal" nursing, in which nurses lose traditional forms of spatial and emotional proximity to patients and colleagues. In this context, "caring begins to stand out as something unusual and ultimately deviant" (Malone, 2003, p. 2322). Nursing is reconfigured into

> a technical means for transforming illness and injury into consumption of services. Switching bedside nurses to distal managers serves the commodification process by constituting nursing care as a cheaper product that, in turn, frees up funds for consumptive acquisition of technological equipment and administrative and information systems, both of which reinforce commodification – the equipment as commodity and the systems as ways to efficiently manage commodity acquisition and distribution. (Malone, 2003, p. 2324)

Distal nursing is a consequence of rationalized models of care. It attempts to fragment and devalue nurses' caring work, and to strip nurses of their capacity to define care on the basis of spatial and emotional proximity to patients. It also emphasizes the acquisition of health information technology, a characteristic of distal nursing that is relevant to the findings discussed in Chapter Four.

Malone contrasts distal to "proximal" nursing, which she frames as a form of resistance to the distal model. Nurses who practice proximal nursing "understand patients as particular persons situated within social worlds," work to "shape the hospital as a place of healing," and "privilege knowledge derived from the patient's life and the experience of providing care" (Malone, 2003, p. 2323). For example, proximity emerges

from traditional forms of physical care such as back rubs, which provide an opportunity for close contact between nurse and patient, the chance for the nurse to gauge a patient's physical and emotional condition, as well as educate a patient about her particular ailment. Rationalized models of care often make such practices impossible, for they burden nurses with a patient load that allows them to provide only the bare minimum of care. Back rubs are a luxury and represent a bygone era in healthcare (Armstrong et al., 1997]. Proximal nursing's emphasis on physical and emotional closeness between nurse and patient is thus "a powerful form of spatial resistance that reveals, sustains, and creates alternative ways of constructing illness, care, and relationship" (Malone, 2003, p. 2324).

The literature summarized thus far has established nursing as a form of feminized caring work. This work takes place in a gendered political economy of healthcare underscored by the relations of patriarchal capitalism. Nurses must struggle to represent their caring work in a way that reflects its value and the skill required to perform it, as well as preserves their professional autonomy, in the current context of constrained funding and rationalized work design. In the following section, an overview of the literature on gender and technology will further complicate the relationships between caring work and gender, for the delivery of care takes place in an increasingly technologized work environment. This has consequences for nurses and how they define their caring work, as my discussion of the literature will demonstrate.

Nursing and technology

The oppositional relationship between distal and proximal nursing

helps to situate nursing within a complex set of social relations largely centred upon the feminized obligation to care. Malone (2003, p. 2324) argues that distal nursing serves to facilitate the commodification and technologization of nursing care. In particular, it enables the purchase of technical systems designed to manage care and caregivers, as evidenced by broad trends in Canadian healthcare funding and policy (Balka, 2001). This example is a useful entry point into a discussion of nursing's relationship to technology. Nursing and technology are "inexorably linked" (Sandelowski, 2000, p. 1); nurses routinely use a range of technologies in their work practice, including thermometers, blood pressure cuffs, heart monitors, and hospital computer systems. Technology is a tool used in the provision of patient care. It is not a neutral artifact, however, for technology is made by humans and thus embodies social relations (Law, 1991; MacKenzie & Wajcman, 1985; Rothschild, 1983).

It is for this reason that nurses have a complex relationship to technology, particularly in terms of their work practice and professional identity. In attempts to make their caring work more visible, "nurses have turned both to and from technology" (Sandelowski, 2000, p. 178). Nurses who turn to technology align themselves with the technological aspects of their work. Technology becomes a means for nurses to validate their knowledge and legitimize their professional practice. When turning away from technology, by contrast, nurses align themselves with the caring, emotional component of their work. Technology is placed in opposition to nurses' personal, embodied interactions with patients. As the following discussion will demonstrate, nurses' relationship to technology is inherently complex, particularly when situated in relation

to the gendering of technological competence and within a broader political economy of healthcare.

Skill and the masculine culture of technology

The nature of nursing's relationship to technology is attributable in part to the masculine culture of technology. This culture is "fundamental to the way in which the gender division of labour is still being reproduced today" (Wajcman, 1991, p. 21). In the workplace and in the home, "technological knowledge" and "technological know-how" are "sharp differentiators of men and women" (Cockburn, 1985a, pp. 17-18). Technology is a masculine preserve. The gendering of the socially constructed public/private divide, and the related sexual division of labour, shape expectations of how women and men should relate to technology:

> Women remain largely responsible for minding home and hearth (whether or not they engage in paid employment), while men are expected to conquer new worlds, make amazing scientific discoveries and transcend the mundane through high art and technological progress. Indeed the goal of transcendence – the pursuit of human endeavour beyond the simple sustenance of life – has been historically articulated as an almost singularly masculine project. Women, meanwhile, are identified with what is viewed as the drudgery of immanence, forever preoccupied with the necessities of daily life (cooking, cleaning, reproduction and so on). (Millar, 1998, p. 15)

Notions of femininity and the particular character of women's work shape women's relationships to caring and technology. From a social standpoint, the difference between caring and technology lies in the fact that, while women are taught and expected to care, they are not taught or expected to become expert users of technology. Instead, women are given a distinctly different message, as a consequence of

> the social messages whispered in women's ears since birth: mother to daughter, "Don't touch that, you'll get dirty"; father to daughter, "Don't worry your pretty little head about it"; teacher to young girl, "It doesn't matter if you can't do math"; woman to woman, "Boy, a man must have designed this." (Bush, 1983, p. 156)

For women, this continued process of gender socialization creates barriers to the acquisition of technological knowledge. The literature on gender and technology suggests that women's relationships to technology are founded on socially constructed notions of femininity and associated processes of gender socialization. In Western culture, masculinity and technology are "symbolically intertwined, such that technical competence has come to constitute an integral part of masculine gender identity" (Grint & Gill, 1995, p. 8).

The masculinization of technology has particular consequences for women who work with it, particularly in terms of the definition of their labour as skilled or unskilled. In a discussion of the printing industry's gender relations, Cockburn (1985b, p. 136) describes how the gendering of work creates a disjuncture between perception and actual content of work:

> The compositor sitting at a keyboard setting type is represented as doing skilled work. A girl typist at a desk typing a letter is not – though the practical difference today is slight.

For all intents and purposes, the work is the same, yet we categorize it differently. When women work with technology, their work is defined as unskilled on the basis of gender rather than content (Cockburn, 1985b; Webster, 1996). This is evident in the microelectronics industry, where women are employed in the assembly of electronic components on the basis of their presumed docility and "nimble fingers." Women electronics workers in Malaysia, Silicon Valley and elsewhere work with technology

in a way that is painstakingly precise, yet they are deemed unskilled (Dyer-Witheford, 1999; Enloe, 1989; Sussman & Lent, 1998). Women who break gendered stereotypes by becoming expert users of technology, and who choose to work in male-dominated, technologically-focused professions, must contend with discrimination, hostile work environments, and the notion that they are not feminine (Cockburn, 1985a, 1985b, 1991). Like caring work, technological skill is saturated with sex (Phillips & Taylor, 1980) and has profound consequences for women workers.

Healthcare's tech-fix: Implications for professional practice

In addition to the feminization of care, the literature on gender and technology demonstrates that nurses must also contend with the masculinization of technology and technological skill. This is of particular relevance in healthcare's current political and policy climate. Funding is constrained throughout the system, placing an increased burden on resources and staffing. Policy decisions reflect a vision of technology as a solution to the challenge of delivering advanced healthcare to more patients with the same or less funding, as the implementation of PCIS at VGH exemplifies. It is a perspective dependent on faith in the "tech-fix," the implicit assumption "that health, like other aspects of our lives, benefits from the latest, most efficient technologies" (Sinha, 2000, p. 295). "Tech-fixes" continue to proliferate in the hospital environment, and in order to comprehend their pervasiveness, we must understand "the growth of information technology in the hospital environment...within the context of a capitalist economy" (Choiniere, 1993, p. 64).

Pervasive though these capitalist interventions may be, Wagner (1993, p. 298) suggests that the promise of technology in healthcare is not always realized:

> Computers are inseparable from the preoccupation of health administrators and legislators with exploding costs and the shortage of nurses. To many hospital administrators and health officials information technology seems the most appropriate answer to these problems. They model and use information technology primarily as a means of making procedures more efficient, of further standardizing medical and nursing interventions, of locating 'waste' and, as a consequence, of redefining the functions of hospital work. Feldberg (1993) argues that there are hardly any studies that prove efficiency gains derived from the potential of computer systems. However, they act as powerful images of efficiency.

Nurses working in a context of constrained funding must adapt to the new technologies introduced in their workplaces, sometimes to the detriment of their professional practice. These technologies are not always as efficient or useful as they were hoped to be, and nurses are often the ones forced to pick up where the technology leaves off, requiring them to engage in forms of invisible work (Sharman, 2003a; see also Balka, 1997; Star & Strauss, 1999). As is often the case when new technologies are introduced into feminized – indeed, all – workplaces, technology changes the content of nurses' jobs and affects their work processes (Choiniere, 1993; Feldberg & Glen, 1983; Novek, 2002; Prasad & Prasad, 1994). While technology is a useful tool, it can sometimes be a hindrance to the provision of care, especially if poorly or inappropriately designed (Sharman, 2003b). Technologies like hospital computer systems are aligned with processes of rationalization and standardization in the delivery of care. They embody a vision of healthcare premised on speed, innovation, and the precise surveillance and accounting for of care and caregivers. The philosophy underlying the implementation of

new technology in healthcare can fundamentally affect the content of the nurse-patient interaction, as evidenced by Malone's (2003) discussion of distal nursing.

Turning to technology

The role of technology in nursing care is difficult to characterize in that it depends on the functionality of the technology, nurses' experiences using it, and the broader context in which use occurs. As caring workers in a feminized profession who are regular users of technology, nurses have complex and sometimes contradictory relationships to technology. Nurses have adopted different strategies for dealing with technology and locating it in the context of their caring work. Some nurses have turned to technology, employing it to enhance their practice and validate their knowledge. In this formulation, technology mediates between nurse and patient or nurse and physician. Technology functions as a means to validate nursing knowledge, as in the case of electronic fetal monitoring, which makes "visible the accuracy of the nurse's 'intuition'" (Sandelowski, 2000, p. 154). Other nurses have taken up the use of technology in nursing practice with increasing sophistication and have developed an entire field of nursing informatics (Ball et al., 2000). Technology is perceived as a means to legitimate nurses' caring knowledge and their caring work.

For the nurses and clerical staff in Prasad and Prasad's (1994) study of the computerization of a Health Maintenance Organization (HMO), the introduction of new technology in their workplace represented progress and professionalization. Nurses

> frequently mentioned their ability to work with machines such as scanners, radiology equipment, and computers as getting them away from the Nightingale image and helping them gain recognition as professionals. (Prasad & Prasad, 1994, p. 1447)

The nurses in this study regarded technology as a means to get away from the "Nightingale image," a gendered representation of nursing's early history as both occupation and 'calling' (Reverby, 1987). Professionalization through technology may be a way for nurses to gain skilled status and to combat the feminized stereotypes attached to their profession. Trends in work patterns of male nurses reflect this strategy, as they often choose to specialize in areas that require less physical care and more technological interventions, such as the ED and ICU (Kauppinen-Toropainen & Lammi, 1993). Even when confronted by the fact that the new technology's reorganization of their work processes caused a loss of "personal and contextual knowledge" about patients, the HMO staff in Prasad and Prasad's (1994, p. 1451) study "remained convinced that computerization had enhanced their professional standing." For some healthcare workers, the benefits afforded by turning to technology, such as heightened professional standing, ease of access to information, and validation of their knowledge (as has been the case in nursing with electronic fetal monitors), outweigh the costs, even when those costs entail a shift in the content or delivery of care.

Turning away from technology

Other nurses have turned away from technology, positioning their caring work in opposition to the machine relations of technology. This strategy emphasizes the emotional component of nursing, the embodied human interaction between nurse and patient, and the work nurses do

to create an environment in which technology can be successfully employed (Sandelowski, 2000; see also Gaut, 1992; Gaut & Boykin, 1994). Rather than argue that technology is synonymous with nursing care, this strategy contends that technology could not function *without* nursing care, in that nurses mediate between patients and technology. Technology can serve to legitimize nurses' knowledge, but their knowledge and the skill borne of extensive caregiving experience can also be a means to validate or challenge what technology tells them, therefore ensuring that patients receive the safest and most appropriate care. "In the face of technology they saw as alien and imposed," nurses in Novek's (2002, p. 400) study of the failed introduction of a drug distribution system in a Canadian hospital "asserted the value of their experienced human judgement in protecting patient safety."

Nurses are skilled users of technology, but they are also skilled caregivers who provide a human alternative to the cold machine relations of technology. Malone's (2003, p. 2317) discussion of proximal nursing encapsulates this vision of nursing practice, for it centres on the nurse's ability to sustain "some meaningful *proximity* to patients" [emphasis in original]. As Malone (2003, p. 2324) argues,

> Nursing's power lies in its honoring of the particular and relational; it is thus important to understand that "proximal" nursing is a source of human resistance to modernity's tendency toward abstract, commodified ordering and a challenge to existing power relations.

Proximal nursing is a form of resistance to a bureaucratic and highly technological understanding of healthcare. In taking this position, nurses realign "their practice with an entity traditionally denigrated in Western culture: feminine caring" (Sandelowski, 2000, p. 178). Though

the feminization of nursing care dates back much earlier, Sandelowski (2000, p. 9) describes the contemporary origins of this perspective:

> [I]n part to offset the blurring of technology into caring, nurses began in the 1970s to depict nursing and technology as in opposition to each other, with nursing as the humane antidote to technology. To position nursing as a female culture at odds with masculine technology, nurses wary of technology drew from ideological or referent systems that linked female/nurse to nature, nurturance, and caring, and technology to male/power and control over nature. Nursing/touch and technology were represented as two opposing paradigms of care.

The distinction between "true" and "technical" nursing stems from the oppositional paradigms of nursing/touch and technology (Sandelowski, 2000, pp. 133-4).

In this formulation, "true" nursing involves touch, closeness and emotional care. The formation of an emotional connection between nurse and patient is a central element of this kind of nursing practice, and a "defence of the importance of emotional labour is...central to the affirmation of nursing's worth" (Porter, 2001, p. 309). Hochschild (1983, p. 7) defines emotional labour as the "management of feeling to create a publicly observable facial and bodily display." It requires the worker to "induce or suppress feeling in order to sustain the outward countenance that produces the proper state of mind in others" (Hochschild, 1983, p. 7). As a kind of labour frequently required of workers in feminized caring professions, emotional labour has particular consequences for women:

> As traditionally more accomplished managers of feeling in private life, women more than men have put emotional labour on the market, and they know more about its personal costs. (Hochschild, 1983, p. 11)

This is true in nursing. The majority of nurses "see emotional engagement as a requirement of excellence in nursing practice," and nurses' caring work is a form of emotional labour (Henderson, 2001, p.

133; see also James, 1992; Porter, 2001). The emphasis on emotional labour in nursing further underscores the differential value assigned by many nurses to caring skill over technological competence. Emotional labour is taxing, feminized work yet it is perceived to be essential to excellent nursing practice. Adept use of technology is not afforded similar importance.

Though an integral part of their professional practice, the emotional labour required of nurses can be exhausting. The intensity of nurses' emotional engagement with patients may take a severe toll on them. As Henderson (2001, p. 131) explains,

> The decision of any individual nurse to care for (or emotionally engage with) a client is therefore one which exposes that nurse to the potential for personal costs or benefits as well as professional ones.

The repercussions of this work are at their most extreme when nurses are driven to physical and/or emotional exhaustion, and a startling number of emergency nurses suffer symptoms of posttraumatic stress disorder (PTSD) (Laposa & Alden, 2001; Laposa, Alden & Fullerton, in press).[7]

'Paper work' vs. 'nursing care': Technological change in healthcare

The defence of emotional labour highlights the "sentimental work" nurses undertake as a consequence of the introduction of new technologies. This work involves "educating patients about new devices,

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[7] Past studies have shown that prevalence rates of PTSD in the general population range from 0.4 to 4.6%. In Laposa & Alden's (2001, p. 49) study of emergency room personnel, "twelve percent of participants met formal diagnostic criteria for PTSD, and 20% met PTSD symptom criteria."

getting patients to accept and comply with their use, and alleviating patients' fears about them" (Sandelowski, 2000, p. 2). It is further evidence of the complex and gendered relationship(s) between nursing and technology. This relationship cannot be reduced to a simple 'nursing care + technology = ?' formula, for the relationship hinges on such factors as the identity, training and gender of the users, designers and other actors; the design, implementation and utility of the technology; and the wider organizational, political and policy contexts in which a technology is introduced. Wagner (1993, p. 300) acknowledges this complexity when she argues that

> introducing computers in a female occupation is not simply a case of imposing 'male' technology thus excluding 'female' care-oriented practices and values. It seems important to look more in-depth at the interplay of existing practices, beliefs and ambitions in the field of nursing and probe and understand present computer applications against this background.

As such, the best way to explain the relationship between technology and nursing care may be to refer to other case studies of the implementation of new technologies in the healthcare setting. These studies will be useful points of comparison for the findings reported in Chapter Four, and are indicative of the diverse experiences of healthcare workers working with technology.

The title of this subsection was inspired by Jacqueline Choiniere's (1993) case study of the implementation of two new technologies in a Canadian hospital: a computerized information system and a patient classification system. Both technologies were problematic and did not deliver the results (improved efficiency, fewer errors, etc.) anticipated by hospital administration. Users resisted the technology and "many staff nurses avoided the computer and continued to use the telephone to

communicate diet changes or obtain lab results" (Choiniere, 1993, p. 66). Nurses were particularly critical of the new technologies' emphasis on administrative work and the technologies' effects on work processes. The nurses Choiniere interviewed "did not consider any of the work required on the computer to be skilled" (Choiniere, 1993, p. 79). They differentiated between "paper work" and "nursing care," and spoke with feeling about the effects of the increased paper work on their emotions and their relationships with patients:

> It's so bad some days that I actually feel annoyed if my patient has chest pains...especially if I am behind in my paper work...I feel so guilty. I mentioned this feeling to some of the other nurses. They said they felt the same way. It is just too much paper work. (Choiniere, 1993, p. 79)

For nurses, "administrative tasks as care are...controversial," so much so that "administrative care" did not appear in the first two editions of the nurse-created Nursing Intervention Classification (Bowker & Star, 1999, p. 246).

In Choiniere's study, the new technologies did not work as expected and in fact became a burden on nurses intent on emphasizing patient care in their professional practice. Her findings echo Campbell's (1994) discussion of patient classification systems as a source of stress on nurses. Since the implementation in hospitals of technologies for 'classifying' patients and the care they require,

> the systematic construction of information and its transfer from the point of service 'production' to management has become the central organizing feature of health-service administration. Major expenditures on computers, software, and information management personnel have followed, as health-service institutions have come to rely on management practices in which systematic information is integral. (Campbell, 1994, p. 593)

The introduction of such technologies, including PCIS and similar systems for tracking patient information, often facilitates the rationalization of nurses' (and other health professionals') work and exemplifies the shift from distal to proximal models of care. These technologies are bound to have an effect on nursing care, particularly as they are used as a justification for work speed-ups and staff cuts.

Like classification systems, patient information systems can have significant and detrimental effects on work processes. Balka, Messing, Armstrong and Sharman (2003, p. 21) describe a problematic data entry system used by a group of hospital admissions clerks in Quebec that "did not allow the clerks to enter information correctly in all the required fields, nor did it allow clerks to enter information that would facilitate their own work." Users coped by typing in additional information or adding colour-coded Post-it notes to the paper forms. In doing so, they engaged in articulation work. To facilitate their work processes, the clerks had to devise workarounds, "a form of on-the-job innovation" that enables the user "to circumvent the limitations of a particular technology in a particular setting" (Balka, 1997, p. 168). This echoes the experiences of admitting clerks at Vancouver General Hospital, who are forced to work around the shortcomings of PCIS, a similarly inflexible patient information system (Sharman, 2003a). When asked to describe the system, one clerk answered, "It's not a very computer-friendly program. It kind of sucks, actually." She elaborated, "It's not very flexible at all" (Sharman, 2003a, p. 1).

PCIS does not account for the difference between work design and work process. As users cannot adapt the system's design to meet their needs, they must adjust their work processes to make up for PCIS'

shortcomings. This strategy exemplifies Franklin's (1999, pp. 80-81) notion of "coping," a means of mitigating disaster that requires of users a profound understanding of the context in which they work. Workarounds are part of this coping strategy, as PCIS is not programmed to encompass the full range of users' needs and experiences. The system will not, for example, allow users to cut-and-paste information from one screen to another. Character spaces are limited, which means staff must devise alternate means of inputting unusual data such as lengthy names or foreign addresses. Moreover, the system requires double entry of much data (for the maintenance of both paper and electronic records), a time consuming process. Hospital staff are frustrated with PCIS' shortcomings. Neither the staff nor their unions were sufficiently consulted in the process of the system's design and implementation; a more appropriate and effective system could likely have been designed in consultation with them.

PCIS, like the classification systems described above, emerged in a context of constrained funding to healthcare (Balka, 2001). A constellation of factors at the micro-, meso- and macro-levels (including the provincial government's refusal to fund the patient information system) resulted in a public-private partnership between Vancouver General Hospital and BC Tel, the provincial telephone company (Balka, 2001, p. 9).[8] This controversial partnership facilitated the acquisition of PCIS from an American vendor. PCIS was intended to replace an existing

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[8] The micro-level is the individual level. It includes how workers use and experience technology, as well as the worksite itself. The meso-level is the organizational or institutional context in which work takes place, while the macro-level is the broader social context. It encompasses economic, policy, and belief systems (Balka et al., 2003).

system and enhance the hospital's capacity to maintain electronic patient records. The system was the subject of criticism by unions and other groups from very early on. The most damning criticism may have come in a 1999 report released by the Hospital Employees' Union (HEU). It followed on the heels of work-related conflicts caused by PCIS and outlined

> numerous problems that had arisen with the implementation of the new PCIS system...The union argued that 'the hospital had failed to grasp the intricate work processes of the clerical and technical staff who play a crucial role in maintaining quality health records', that transition phases in system implementation had been badly managed (which included a failure to monitor or evaluate impacts of the new PCIS), and that staff positions had been cut prior to tangible proof that work had been reduced. (Balka, 2001, pp. 10-11)

The HEU's concerns were echoed in a 1999 consultant's report. The consultant was puzzled by "'the lack of involvement by some key stakeholder/front line staff'," a failure also criticized "in a more recent health board planning document" (Balka, 2001, p. 11).

PCIS, like the data entry system described by Balka et al. (2003), fails to meet users' needs. This is due largely to a problematic design process, and to what Balka (2001, p. 15) describes as a "privileging of specialized knowledge:"

> A privileging of specialized knowledge contributed to development of the controversial system in at least two ways. First, it served to legitimate the initial decision to purchase the system, and, second, when the unions attempted to raise concerns about the system, the privileging of specialized knowledge also contributed – along with the traditional framing of the union-as-enemy in the eyes of management – to the initial delegitimation of union concerns.

Users were not sufficiently consulted in the system's design and implementation; their concerns, as communicated by the unions, were not taken seriously. A hierarchical design process led to the design and

implementation of an inappropriate technology. This is a gendered hierarchy, for "there is an enormous gulf between the practices of systems designers and the world of work inhabited by women" (Webster, 1996, p. 148). A lack of worker control in processes of design and implementation can be a significant stressor on workers (Statham, 1993; Statham & Bravo, 1990). The system demands ever-greater flexibility from its users, for they are called upon to compensate for its shortfalls. In order to make PCIS work for them, users (who are predominantly women) must engage in a great deal of invisible work. The performance of this invisible work by women workers in a feminized profession makes technology's gendered nature, from design to use, most visible.

Conclusion

This chapter opened with a discussion of women's work that highlighted the sexual or gender division of labour. The construction of women's work affects the kinds of work for which women are thought to be 'naturally' adept, and in turn influences how work is understood. By virtue of women's perceived propensity for caring, caring work becomes a particular kind of feminized labour. Women who work in the home or in the paid workforce experience this, and the feminization of care has particular consequences for nursing. Nurses' caring work is devalued, stripped of skill and rendered invisible.

All this takes place within a gendered political economy of healthcare that simultaneously relies upon and devalues women's caring work. It is a political economy increasingly characterized by processes of rationalization and the precise accounting for of care and caregivers. Technological interventions in the form of computer systems like PCIS

are frequently touted as the solution to the challenge of efficiently delivering quality care. Nursing care that cannot be commodified and accounted for is written out of the medical record. Many nurses do not share this vision of healthcare and they often resist technology's encroachment on their professional practice by reasserting the importance of their embodied caring work. The oppositional relationship between distal and proximal nursing exemplifies this tension, in particular the framing of proximal nursing as an act of resistance (Malone, 2003).

The masculinization of technology and technical competence complicates this relationship. The same gendered assumptions that feminize caring work and deem it unskilled shape how we perceive women's work with technology. Nursing is a feminized caring profession that requires practitioners to routinely use a range of technologies. Consequently, it has a complex relationship to technology, for nurses have turned both to and from technology in order to best articulate the importance of their caring work.

There are tensions within the profession regarding the use of certain technologies, particularly when related to the controversial performance of administrative tasks. Many nurses distinguish between "paper work" and "nursing care" (Choiniere, 1993) or "true" and "technical" nursing (Sandelowski, 2000). As healthcare organizations frequently choose patient classification and patient information systems as the tools to account for care, the relationships between nursing and technology will likely increase in complexity. The various technological failures discussed in this chapter indicate that the success of such

interventions is far from guaranteed. PCIS is a particularly acute example of this, something I will expand upon in Chapter Four.

Chapter Two synthesized the literature relevant to the relationships among gender, technology and nurses' caring work. It highlighted the challenges faced by nurses as women workers in a caring profession, and emphasized the complexities of nursing's relationship to technology. The literature discussed in this chapter suggests that to answer the question, "Does using PCIS to share data facilitate patient care?" requires a complex understanding of the role of technology in healthcare, as well as the gendered political economy in which healthcare is delivered. The way nurses perceive and use PCIS must be situated in relation to the association of femininity with nursing and of masculinity with technology. These themes will be further addressed when I report my research findings in Chapter Four. In the chapter to follow (Chapter Three), I will take further steps toward addressing this thesis' guiding research questions by outlining the methodological approach that underlies my research.

Chapter Three
Research Methodology

I conducted research in the ED at VGH as a means to examine the relationships among gender, technology and nurses' caring work. In keeping with the feminist principles underlying my thesis, I was concerned with going about my field research and interviewing in a way that was respectful to, and not exploitative of, the people who let me into their work lives. Three qualitative methods inform my research. They are grounded theory, Francophone feminist ergonomics and feminist approaches to research and interviewing. Each is addressed below. Data analysis was particularly informed by the methods of grounded theory, and I used NVivo 2.0, a type of qualitative data analysis software, to analyze my data. The methods and research process described in this chapter serve as a bridge between the literature discussed in the previous chapter (Chapter Two) and the research findings discussed in Chapter Four.

Chapter Three provides an in-depth description of the research process. It begins with an explanation of why qualitative, rather than quantitative, methods are the appropriate framework for conducting this kind of research. This explanation is followed by a description of the three approaches to qualitative research guiding the project and the rationale for choosing them. I then offer a detailed description of grounded theory as a method of data collection, analysis and theory generation. A thorough account of my process of data collection follows this section. Integrated into this account are descriptions of the techniques of Francophone feminist ergonomics and feminist approaches

to research and interviewing. The significance of gender in the research process is discussed, and the chapter concludes with a description of how data analysis was conducted.

Choice of methods

The study that forms the basis of this thesis was chosen for its potential as a fruitful site of inquiry into the relationships between women's caring work and technology. The research is qualitative in nature, and relies on techniques of observation and interviewing. Creswell (1994, pp. 1-2) defines a qualitative study as:

> an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting.

Qualitative methods are most appropriate for "research that is explanatory or descriptive and that stresses the importance of context, setting, and subjects' frame of reference" (Marshall & Rossman, 1989, p. 46). Given that the intention of this study is to examine nurses' perceptions of the relationships between caring and technology as they pertain to their caring work, qualitative methods are well-suited to the project. Quantitative methods, though valuable for collecting broad statistical data, could not capture the data needed to answer my research questions in a way that reflects in sufficient detail the diverse experiences of my individual respondents and the context in which they work. Moreover, qualitative methods are commonly (though not exclusively) associated with feminist research, because they enable the feminist purpose of "making diverse women's voices and experiences heard" (Ramazanoglu & Holland, 2002, p. 15).

The challenge for a researcher who is politically and intellectually committed to feminism is to employ a methodology that accounts for power and gives voice to those whose everyday/everynight experiences are being observed.[9] Methodology is always problematic for feminist researchers

> because no rule of method can ensure a direct connection between knowledge and reality...Feminists generally take the whole process of knowledge production to be a social process, and so one in which power relations are inherent. (Ramazanoglu & Holland, 2002, p. 42)

In order to address this challenge, I have chosen to synthesize three approaches to qualitative research, each with the capacity to give voice to the experiences of women workers.

First, the tenets of grounded theory guide my approach to data collection, analysis and theory generation (Dey, 1999; Glaser & Strauss, 1967; Strauss & Corbin, 1994, 1998). Grounded theory requires researchers to be actively and reflexively involved with the research process, and to let data guide the development of theory, not the other way around. It is this "grounded" approach to the research process that makes it an appropriately feminist methodology. Second, my observations of, and conversations with, women workers were informed by the techniques of Francophone feminist ergonomics (Messing, 1998; Messing, Neis & Dumais, 1995; Messing & Seifert, 2001). In particular,

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[9] Smith (2002, p. 42) uses the expression everyday/everynight worlds "as a reminder that women's work in the home isn't just a daytime affair." As the ED operates twenty-four hours a day and is staffed primarily by women, this terminology is similarly appropriate to the environment in which they work. Moreover, as nurses are predominantly women, they must contend with the "home/work interface" as they attempt to mesh family responsibilities with the demands of their paid work (White, 2003, p. 134).

this approach teaches a more holistic understanding of individual work processes, highlighting the capacities and constraints that shape how women workers experience their work. Finally, my approach to interviewing and the broader experience of relationship-building with my research subjects draws both from Mishler (1986) and the feminist literature on woman-to-woman field work and interviewing (Finch, 1993; Oakley, 1981; Wolf, 1996).

Grounded theory

Grounded theory is a way of thinking about the research process and a method for conducting research. In this section, I describe grounded theory as an approach to data collection, analysis and theory generation. Grounded theory provided the underlying methodological framework for my research; it was complemented by the techniques of Francophone feminist ergonomics and feminist approaches to research and interviewing, both of which are described in the section entitled "Gathering of data." Grounded theory was initially presented by sociologists Glaser and Strauss (1967) in *The Discovery of Grounded Theory*. The approach has since been popularized and is used across a wide range of disciplines. It has also become more complex through the elaboration of different strands of grounded theory. Glaser and Strauss, the originators of grounded theory, eventually parted intellectual ways, but both continued to develop their own 'brand' of grounded theory. The approach to grounded theory that I use is based largely on the work of Anselm Strauss and his later collaborator, Juliet Corbin. Strauss and Corbin (1994, p. 273) define grounded theory as:

> a general methodology for developing theory that is grounded in data systematically gathered and analyzed. Theory evolves during actual research, and it does this through continuous interplay between analysis and data collection.

In grounded theory, "data collection, analysis and eventual theory stand in close relationship to one another" (Strauss & Corbin, 1998, p. 12). Researchers go into the field with no preconceived bias and are encouraged to maintain a close and evolving relationship with their data. This is a means for researchers to produce theory that is "'conceptually dense' – that is, with many conceptual relationships" (Strauss & Corbin, 1994, p. 278). Analyzing data in this way generates theory that richly accounts for the perspectives of the actors being studied:

> In grounded theory, concepts are formulated and analytically developed, conceptual relationships are posited – but we are emphasizing here that they are inclusive of the multiple perspectives of the actors. Thus grounded theories, which are abstractions quite like any other theories, are nevertheless grounded directly and indirectly on perspectives of the diverse actors toward the phenomena studied by us. Grounded theories connect this multiplicity of perspective with patterns and processes of action/interaction that in turn are linked with carefully specified conditions and consequences. (Strauss & Corbin, 1994, p. 280)

In the production of theory, research subjects cannot simply speak for themselves, because

> as long as the researcher makes the decisions about the topic of research and how to conduct it and write it up, she holds that power, and most feminists do hold those reins of power, from conceptualization to writing. (Wolf, 1996, p. 19)

There is a necessary process of translation, interpretation and data selection when a researcher selects and analyzes the topic and individuals under study.

Grounded theory will not solve this power differential, but it is a means to conduct data collection and analysis in a way that is sensitive and richly connected to the people and places being studied. In this

sense, then, it is an appropriate methodology for the conduct of feminist research. As Armstrong and Armstrong (1990, p. 139) explain,

> most feminists would now agree that theory building is a continuous process that remains dynamic because it is challenged by research on women's and men's experiences in, actions on, and perceptions of the real world. Increasingly, feminists are 'grounding' theory research.

In this respect, grounded theory is not unique, for "the 'untidy and painstaking process of encountering the social world' has seldom been absent from Canadian feminist theory" (Armstrong & Armstrong, 1990, p. 139). Nevertheless, it is one means to build dynamic feminist theory that is grounded in the actors' everyday/everynight experiences and perceptions.

Gathering of data

Research for this project was conducted in the Emergency Department at Vancouver General Hospital, a site selected for its potential as a fruitful source of data about the experiences of women users of technology working in a feminized profession. Nursing is a form of women's caring work, as discussed in Chapter Two. The nursing workforce in the ED is predominantly female and the nurses routinely engage with a range of technologies in their work.[10] Given that I was unable to be in the field full-time, it was not feasible to observe all parts of the ED (triage, admitting, acute care, treatment, etc.) in equal depth.

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[10] It should be noted that, from a gendered standpoint, the ED's nursing staff is actually somewhat atypical in terms of the ratio of women to men. As discussed in Chapter Two, Emergency Departments and Intensive Care Units commonly have a greater proportion of male nurses; that said, the ratio of women to men in the ED at VGH is by no means equal.

As such, I limited my observations to the ED's triage area. Triage is the central location through which all patients who enter the ED must pass. Here, triage nurses greet and assess patients, as well as enter some of their information into the hospital's patient information system. The ED is a large department both in terms of physical size and organizational scope. It was thus necessary to choose a specific point of focus, and the following discussion will demonstrate why triage was an appropriate choice.

There are three reasons why the triage area became my study's focal point. First, the triage area functions as the passageway into the ED, both spatially and in terms of being the first place in the organization most patients must visit in order to gain access to care in ED (i.e., acute care or treatment) or elsewhere in the hospital (e.g., the psychiatric unit).[11] Triage nurses are some of the ED's most highly skilled clinicians, as they must develop sophisticated assessment abilities and are responsible for maintaining an efficient and appropriate flow of patients through the ED. This combination of high traffic and the presence of sophisticated nursing skills makes triage a compelling focal point for my research. Second, the triage desk's central location means that it also functions as the ED's de facto information booth. Triage nurses are often called upon to be the hospital's unofficial information

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[11] Acute care is where high acuity patients receive treatment. Patients in acute care are often sick enough to require a stay in the hospital and may remain in an acute care bed until space becomes available on an appropriate ward. The ED's trauma bay is part of acute care. It is where patients in need of the most urgent care – for example, someone severely injured in a motor vehicle accident – are treated. Treatment is where patients of lower acuity (an otherwise healthy patient suffering from a sprained ankle or needing stitches, for example) receive treatment.

providers. They answer questions, give directions, look up patients in other parts of the hospital, and show patients and those accompanying them where to find parking, change and food. Triage nurses therefore engage in a great deal of "customer service" and the feminized emotional labour (Henderson, 2001; Hochschild, 1983) that it entails.

Finally, triage nurses routinely use PCIS, as they must enter each new patient's information into the system in order to initiate the registration process, the second stage of which is done by the ED's admitting clerks. As I will describe further in Chapter Four, triage nurses also use PCIS to locate and learn about existing patients, assign beds, view lab results, and to help them make decisions about the organization of patient care in the ED. The nurses regularly use the system to locate information and complete administrative tasks as part of patient care. For these reasons, the triage area is a rich site of inquiry, where highly skilled nurses use technology to complete a range of tasks. It is not representative of conditions throughout the ED, as each area is unique, but it enables the observer to gain an overall sense of the complexity of the ED's various parts and how they work together.

In order to conduct this research, access to VGH's Emergency Department was negotiated as part of the larger SSHRC-funded project described in Chapter One. Simon Fraser University and VGH (through its research arm at the University of British Columbia) both granted ethical approval for the research.[12] Data was collected in two phases of participant observation, "a technique for gathering data [that] is basic to

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[12] See Appendix A for a copy of the Simon Fraser University ethics approval letter.

qualitative research studies" (Marshall & Rossman, 1989, p. 79). Observation of workers was guided by the methods of Francophone feminist ergonomics. This approach "integrates observation of work activity and interviews with workers and key informants in order to create a portrait of the working conditions" (Messing & Seifert, 2001, p. 2). Messing and Seifert (2001, pp. 2-3) summarize the procedures involved in this approach as follows:

> effective and careful listening to women workers to establish the nature and extent of occupational health problems and their suspected causes in work activity; listening to women workers to help determine times and places where the work activity at risk can be observed and documented; establishing a complete context for these observations by prior and complementary interviews and examinations of all sources of data; by observing work activity and registering workers' comments on the activity, testing hypotheses relating to determinants of the work activity; formulating suggested solutions based on the determinants; [and] listening to workers' opinions on the interpretations and solutions, and including them in the analysis.

This approach is "particularly well suited to revealing unsuspected aspects of women's work" (Messing & Seifert, 2001, p. 3). It made me aware of the importance of validating workers' knowledge and expertise, and of working to ensure that I would not do anything to compromise them (e.g., communicating results to management that would lead to cuts in staffing or inappropriate changes to work design). Although my work is not specifically oriented to the study of workplace health, the Francophone feminist approach to ergonomics is a useful lens through which to view and interpret women's work. This approach is particularly instructive as a framework for understanding the complex interplay among constraints, capacities and individual work processes.

The first phase of participant observation commenced in March of 2002 and lasted until August of that year. I visited the ED

approximately two times a week and typically observed individual workers (the majority of whom were triage nurses or admitting clerks, though on one occasion I also observed an orderly as he went about his work).[13] The second phase of observation commenced in February of 2003 and lasted until May. I visited the ED approximately three times a week and typically observed from a vantage point behind the triage desk where I could observe the entire triage area and speak to workers without getting in their way.[14] In total, I conducted approximately 150 hours of observation in the ED between 2002 and 2003.

All workers who were individually observed were given information about the research and signed an informed consent form. They were also given a participant feedback form in order to communicate their impressions of the research experience.[15] Attempts were also made to gain the consent of other workers not under direct observation. This was complicated by the pace of work in the ED. There is rarely time to stop and listen to a researcher explain her study, let alone read an information sheet and fill out an informed consent form in duplicate. Additional obstacles were high rates of staff turnover and the fact that full-time nurses work four days on, five days off. An ED nurse's typical schedule consists of two twelve-hour day shifts lasting from 7:00 a.m. to

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[13] Data on admitting clerks was collected as part of the larger SSHRC project. It also provided me with a more sophisticated understanding of the interrelated work processes in the ED.

[14] See Appendix B for a table detailing dates and times of observations.

[15] See Appendix C for copies of these forms.

7:00 p.m. and two twelve-hour night shifts lasting from 7:00 p.m. to 7:00 a.m., followed by five days off. Gaining consent from all workers in such an environment is a challenge. All participants who were individually observed and/or interviewed gave their written consent. I made every effort to introduce myself and receive at least oral consent from workers who were not the subject of observation when I sat in the triage area and engaged in general observations. It is difficult to estimate the number of individuals observed, as Triage is a high-traffic area often occupied by multiple staff members at one time. Observation of individual workers took place on seventeen separate occasions, and I observed in the ED for a total of fifty-two days.

Participant observation in the ED was complemented by a series of eight one-on-one tape-recorded interviews with nurses.[16] Of the eight nurses I interviewed, seven were currently working in the ED. One had many years' nursing experience but has spent the past few years working as the ED's Clinical Analyst (i.e., a liaison between clinicians in the ED and the hospital's "techies"). Six of the eight nurses I interviewed were women. Because shift work made it difficult to schedule interviews outside of work, interview subjects were not selected according to a specific set of criteria.[17] Instead, interviews were arranged with whoever was willing and able to sit down and talk about their work. On any given day, availability of nursing staff for interviews depended on how busy it

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[16] See Appendix D for a table detailing information about the interviews.

[17] I had originally planned to conduct interviews outside the ED. In my experience, however, nurses were generally (and understandably) quite reluctant to do work-related things outside of paid hours of work. This may speak to levels of fatigue and overall morale within the profession, and is one of the challenges of research in such a context.

was in the ED. As it is a very unpredictable work environment, I often went into the field, tape recorder in hand, and asked around at triage until someone consented to be interviewed.

In a context of staff cuts, constrained funding to healthcare, and the need to care for a greater number of very sick patients, it was not always possible for nurses to take time for an interview. I was successful on a number of occasions, though the relatively small interview sample is indicative of the challenges I faced in conducting interviews with nurses in the ED. The majority of the interviews were conducted in the ED during work hours, and interview length ranged from fifteen minutes to one hour. We often had to stop at least once during the interview so that nurses could go about their work. The interviews were semi-structured and followed a pre-set list of questions I developed on the basis of four themes as they pertain to nursing: PCIS, technology, care, and gender.[18]

Once each interview was completed, it was transcribed. I transcribed all field notes and interviews myself, a time-consuming process but one that allowed me to develop a high level of familiarity with the data. In conducting and transcribing the interviews, I relied on the approach articulated by Mishler (1986) in *Research Interviewing: Context and Narrative*. Mishler (1986, p. xii) asserts that interviewing is a "form of discourse," a "joint product of what interviewees and interviewers talk about together and how they talk with each other." In emphasizing the joint construction of interviews by interviewer and interviewee, Mishler highlights the interactive nature of this kind of discourse. The

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[18] See Appendix E for the list of interview questions.

interviewer is as present as the interviewee, and interview transcripts should reflect the nuances of this interaction. As such, I took great care to transcribe each interview in its entirety, including pauses and interruptions. Though it may not be immediately apparent as 'data',

> this halting, hesitant, tentative talk signals the realm of not-quite-articulated experience, where standard vocabulary is inadequate, and where a respondent tries to speak from experience and finds language wanting. (DeVault, 1999, p. 69)

This is of particular relevance to a study concerned with the specificities of how nurses define and experience caregiving, a type of invisible work founded on embodied, and potentially difficult to articulate, relationships between nurses and their patients. In transcribing the interviews, I sought to create a document that reflected the interaction between the interview subject and myself in all its conversational complexity, though something (body language, some subtle nuance) is always lost in the translation from embodied human interaction to text. As the following subsection will detail, my approach to interviewing (and to fieldwork in general) was also shaped by gender and a broader feminist orientation.

Gender in the research process

The participant observer "has a gender identity" (Morgan, 1981, p. 91). My gender shaped my experience doing research in the ED at VGH in a number of ways. As a woman researcher observing and interviewing women working in a feminized profession, I was acutely aware of my gender and the need to do my best to create an egalitarian relationship

between researcher and researched.[19] As a woman, my gender located me in a specific way within the space and division of labour in the ED, and I had a particular relationship with the women workers I was observing. First, it affected how I was perceived by people (staff, in particular, and to a lesser degree, patients) in the ED. People who did not know I was a researcher often assumed that I worked in the hospital, a logical assumption given that, though I wore street clothes, I carried a clipboard and wore a hospital identification badge. As I was not dressed in nurses' clothing or a doctor's lab coat, people frequently assumed that I was a social worker, admitting clerk or student nurse. These are all feminized professions and assumptions about my occupation reflect the sexual division of labour in healthcare described in Chapter Two (Ashley, 1976; Gamarnikow 1978).

As a feminist, I was frustrated by the assumptions made about my role as a woman in the ED. At the same time, the 'naturalness' of my gendered image and its placement within the context of the ED afforded me a certain camouflage. In this way, I joined the ranks of feminist researchers who

> have drawn upon patriarchal relations to gain access and, at times, have played upon their race, their class position, and/or their status as women when it was useful. Despite resistance to essentialist thinking or writing, feminists have often used essentialist notions of womanhood in a strategic

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[19] It is important to note, however, that by virtue of who is given the power of research design and interpretation, the research process is often underscored by power differences between researcher and researched. As Armstrong and Armstrong (1990, p. 139) explain, "Women never do simply speak for themselves in empirical research, because as researchers we have already chosen to record what some women say, prompted them to talk about particular aspects of their lives, and edited parts of their representations and interpretations."

> manner during fieldwork, to gain access and acceptance. (Wolf, 1996, p. 9)

In effect, I used a gendered identity to help blend into the background (as much as possible, though this is sometimes difficult in the conduct of participant observation). As a woman who blended in with the caring and/or clerical labour force, I was less visible, even from my central vantage point in the triage area. In particular, doctors seemed to take little notice of me. I suspect that, had I been a male researcher, I would have stood out more or been mistaken for someone working in a higher-status profession (physician, management, etc.). This would surely have affected my visibility as an observer, and probably the way I interacted with individual workers, as well.

My gender also affected the particular way I identified and interacted with the women workers. As Oakley (1981, p. 57) explains, "a feminist interviewing women is by definition both 'inside' the culture and participating in that which she is observing." This dynamic occurred in both interviews and informal conversations with workers. I have talked to women about their children, their relationships, and the latest Hollywood gossip. Often, these personal or mundane conversations would intertwine with more focused talk or questioning about their work processes and the technologies they use in their work. This was not a deliberate attempt to build "rapport" – rather, it arose naturally (as 'naturally' as possible when an outsider is watching you work, that is) as the nurses and other staff came to know me. A "particular kind of identification" (Finch, 1993, p. 170) develops between researcher and

research subjects of the same gender.[20] This shapes the interaction between researcher and subjects, and also shapes my perception of how research results should be communicated and 'used':

> Siding with people one researches inevitably means an emotional as well as an intellectual commitment to promoting their interests...I would endorse Oakley's position that, as a feminist and a sociologist, one should be creating a sociology *for* women – that is a sociology which articulates women's experiences of their lives – rather than merely creating data for oneself as a researcher. (Oakley, 1981, as cited in Finch, 1993, p. 178)

In this regard, I went about my participant observation as both a woman and a feminist, a lived experience and political orientation that informs my work in all its aspects and stages.

Analysis of data

Data were analyzed using the qualitative data analysis software NVivo 2.0, a program designed to facilitate data analysis using the methodologies of grounded theory. The coding categories used in the data analysis were based on broad themes. As I coded the second set of field notes (from the phase of research lasting from February to May 2003), I added additional categories.[21] As is appropriate in the generation of grounded theory, I engaged in numerous stages of coding, moving from broad thematic coding in NVivo to the identification of specific patterns and more precise relationships between categories.

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[20] Though feminist researchers should take pains to not unintentionally reinforce that which they are trying to combat: "[T]he kind of rapport feminists developed in an effort to reject cold, distanced, exploitative, and 'male' methods may have backfired and produced a more intense version of what was being rejected" (Wolf, 1996, p. 20).

[21] See Appendix F for a list of the coding categories.

This process included re-coding the first set of field notes to account for the additional categories added in 2003. Marshall and Rossman (1989, p. 112) describe the process of data analysis in a way that reflects what I did:

> Data analysis is the process of bringing order, structure, and meaning to the mass of collected data. It is a messy, ambiguous, time-consuming, creative, and fascinating process. It does not proceed in a linear fashion; it is not neat. Qualitative data analysis is a search for general statements about relationships among categories of data; it builds grounded theory.

Rather than have someone else check my coding in order to ensure the validity of my findings, I engaged in a process of triangulation, that is, the use of "multiple methods in order to obtain more thorough coverage of a subject by viewing it from different angles" (Ristock & Pennell, 1996, p. 51). Triangulation can be achieved in two ways: "by using different methods for different questions about the same topic, or by using different methods to explore the same set of questions" (Ristock & Pennell, 1996, p. 51). By using different methods to explore the same set of questions, I sought to ensure the creation of a valid and complex set of research findings. The interview and field data were complementary to one another as a means to articulate and expand upon particular themes.

Conclusion

This chapter provided an overview of the methodology I followed in conducting feminist research on gender, technology and nurses' caring work in the Emergency Department at Vancouver General Hospital, a site selected for its potential as a fruitful source of data about the experiences of women technology users working in a feminized

profession. My chosen methodology synthesizes three approaches to qualitative research: grounded theory, Francophone feminist ergonomics and feminist approaches to research and interviewing. It was designed to facilitate as equitable as possible an interaction between the researcher and the research subjects. This interaction is shaped by workplace gender relations and the challenges presented by the research environment.

Field research is an immersive process and the outside reader's understanding of a researcher's findings is only as good as the researcher's description of her work. As such, this chapter is intended to establish the validity of my data by describing the research process and underlying methodology with clarity and precision. Through the articulation of a feminist approach to qualitative research centred on workers' perceptions and experiences, this chapter serves to bridge my research to the literature summarized in Chapter Two. It also functions as a means to contextualize the research findings discussed in Chapter Four, for the research methodology described here is the means by which I sought answers to my thesis' guiding research questions.

Chapter Four
Research Findings and Discussion

In this chapter, I will report and discuss the findings of my research in the ED at VGH, a research process described in the preceding chapter (Chapter Three). My intention is to explore the relationships among gender, technology and nurses' caring work. In particular, I am concerned to answer the research question, "Does using PCIS to share data facilitate patient care?," as well as the three sub-questions stemming from it. They are, first, how do nurses interact with PCIS in the act of caring for patients? Second, how does PCIS fit into nurses' broader understanding of technology's role in the delivery of patient care? Finally, how does gender shape nurses' perceptions of caring work and technology? Chapter Two provided the intellectual foundation for the findings discussed here, and I will return to a number of the themes raised by the literature review in the current chapter (Chapter Four).

This chapter begins by identifying the phrase "Data sharing leads to patient caring" as the carrier of a particular organizational message about technology's role in healthcare. I establish a contrast between administrative technologies, like PCIS, and clinical technologies, like heart monitors. This is a means to explore the disjuncture between the mouse pad's message and how nurses perceive and experience their work as frontline caregivers. I explain how nurses use PCIS to highlight the system's role as boundary object (Star, 1989; Star & Griesmer, 1989) and organizer of cooperative work, then revisit the distinction between administrative and clinical technologies as a way to understand the

contentious nature of administrative tasks in nursing.[22] Subsequently, I describe the differences between how nurses cope with the failure of administrative and clinical technologies. I turn to a discussion of how nurses define care in relation to technology and emphasize the skilled nature of embodied caring work. The chapter concludes by situating the relationships among gender, technology and nurses' caring work in a broader social context. I argue that embodied nursing care is an act of resistance to the rationalization of healthcare and a means for nurses to redefine the visibility and value of their feminized caring work.

"Data sharing leads to patient caring"

The phrase "Data sharing leads to patient caring" is imprinted on PCIS promotional mouse pads used at computer terminals throughout Vancouver General Hospital. At first glance, the mouse pad's message is seemingly uncontroversial, if somewhat abstract. The Patient Care Information System is intended to enable the rapid transmission of patient information throughout the hospital, thus facilitating the efficient delivery of appropriate care at each stage of a patient's hospital visit. The relationship between "data sharing" and "patient caring" is not so seamless, however, for it depends on the functionality of the system and how the caregiver perceives the role of data sharing in the provision of patient care. Implicit in the phrase is a particular organizational message about the function of information technology in healthcare. It encompasses a vision of work practice and professional priorities centred

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[22] Boundary objects are defined and discussed on page 72.

around the use of technological interventions designed to precisely account for patients and their care (Armstrong et al., 1997; Choiniere, 1993; White, 2003). The goal of such technologies is to expose the intricacies of patient care, to make concrete the intangible (Bowker & Star, 1999; Campbell, 1994; Malone, 2003). Information gathered and transmitted by newer, faster and extensively networked technologies is perceived to be a means of adding value to a cash-strapped healthcare system. "Data sharing leads to patient caring" is no empty phrase. It is a managerial dictate borne of the same political context and steeped in the same faith in health information technology that motivated PCIS' initial purchase, as described in Chapter Two and detailed by Balka (2001).

In order to answer the research questions guiding my thesis, this chapter reports the results of research conducted in the ED at VGH. Here, I reveal the disjuncture between the exhortation to share data in the name of patient care and the realities of how nurses perceive and experience their caring work. Although they are frequent users of the system, the nurses I interviewed did not make a direct association between PCIS and patient care. Furthermore, many nurses defined caring in such a way as to distinguish it from the cold, machine relations of technology. This disjuncture is suggestive of the challenges one might face when trying to answer the question, does using PCIS to share data facilitate patient care?

In this chapter it will become clear that there is no simple answer to the research question guiding my thesis, for it must be regarded at the levels of both practice and perception. The system's role in patient care hinges on how nurses, as users, caring workers and women, locate PCIS

in relation to the other technologies they use in their work and the larger task of caring for patients. To underscore how nurses perceive and use the system, I draw a distinction between administrative technologies like PCIS and clinical technologies like heart monitors. These technologies represent different facets of nurses' professional practice, for nurses prioritize administrative work and clinical care differently. This distinction and its connection to how nurses define care is situated within the wider gendered context in which nurses, as workers in a feminized and increasingly rationalized profession, use technology in caring for patients. Administrative technologies, as the admonition to share data in the name of patient care suggests, represent a vision of rationalized, bureaucratized and high-tech healthcare. In this chapter, I demonstrate that nurses resist this vision in favour of a paradigm of care founded on their embodied caring skills.

PCIS and patient care

In a fast-paced work environment like the Emergency Department, where the particularities of a patient's condition can be a matter of life or death, information sharing is an integral part of work practice. Triage nurses are responsible for assessing and managing the care of numerous patients and must communicate information about them to colleagues throughout the hospital, including other nurses, clerks, orderlies and physicians. Information sharing encompasses face-to-face verbal communication, telephone calls, the creation, distribution and continued maintenance of paper records, and the transmission of information via PCIS. On the basis of these frequent and varied acts of communication, it is possible to argue that data sharing does, in fact, facilitate patient

care. Nursing is founded upon the exchange of information between nurses, patients and other health professionals about the specificities of a patient's emotional and physical condition.

Despite the importance to professional practice of this kind of exchange, the relationship between data sharing and patient care cannot be so simply conceptualized, particularly when data sharing is specifically associated with a computer system. While the transmission of knowledge about patients is integral to patient care, administrative technologies like PCIS occupy a particular, and often contentious, place in nurses' work practice (Bowker & Star, 1999; Choiniere, 1993). PCIS may not conform to their vision of care or function in a way appropriate to their needs, yet nurses at VGH have no choice but to use the system (Sharman, 2003a). It is part of how their work is designed and is a condition of their employment. In spite of this, nurses use the system to their advantage, as will be described below. Nurses locate patients within the space of the system and use PCIS as a means of both spatial and conceptual ordering. PCIS functions as a boundary object (Star, 1989; Star & Griesmer, 1989) and is an artifact around which nurses organize their cooperative work (Berg & Bowker, 1997; Tellioglu & Wagner, 2001). Nurses do not associate PCIS directly with patient care, however; for them, the relationship between data sharing and patient care is not as seamless as the organizational discourse symbolized by the message on the mouse pad suggests.

Work practice in the ED: How nurses use PCIS

Concern for patient care delivery entails that triage nurses must be aware of their workspace and its occupants. This awareness includes

knowing the number of patients under their care, the patients' complaints and acuity levels, and which patients are in need of a bed. Triage nurses must also keep track of the number of empty beds in the ED's acute care and treatment areas, and allocate them appropriately to patients as they become available. The triage nurses I observed frequently use PCIS. As most patients' first point of contact, they are responsible for each patient's initial registration into the hospital computer system. A triage nurse will first assess a patient at one of the triage bays, noting the patient's information on a paper Emergency Assessment form. There are two types of Emergency Assessment (EA) forms – the first, "Emergency Nursing Assessment I," is two pages long. Nurses use it for patients of lower acuity. The second, "Emergency Nursing Assessment II," is six pages long and is a much more detailed record of a patient's condition and medical history. Nurses use this form for patients of higher acuity. After filling out the appropriate form, the nurse will enter the patient's name, complaint and time of arrival into PCIS, though this does not always happen directly after she interviews the patient. The nature of the work environment is such that interruptions are common and nurses often simultaneously engage in multiple tasks. The rhythms and, to a slightly lesser degree, order of the work process vary according to conditions in the ED. These conditions change from one day to the next and are rarely predictable. The second step in the registration process occurs when a patient (and/or the person accompanying her) gives more detailed demographic information (address, occupation, next-of-kin, etc.) to one of the ED's admitting clerks.

The nurses also use PCIS to view lab results and locate patients.

In addition to the registration screen and lab results display, one of the most frequently viewed screens is the Emergency Department census, a complete listing of all patients in the ED. The ED census displays an unalphabetized list of names and selected patient information for all patients in the department. A text-based interface, this screen is not a sophisticated virtual representation of the Emergency Department, though the nurses use PCIS and this screen in particular as a means to maintain a sense of the ED as a whole. In a workspace of considerable size with a constantly shifting population of patients, staff, family members, friends, and others, the ability to see what is happening is very important. This is reflected in the physical layout of the ED, with its open-concept design and "walls" made of fabric and Plexiglas.[23] It is similarly reflected in the way the ED census functions for nurses as a virtual representation of the physical space of the ED and the people in it. As the following discussion demonstrates, the system, and the census display in particular, works in conjunction with nurses' tacit knowledge and their spatial understanding of the department as a whole.

Keeping track: Technological artifacts in cooperative work

PCIS facilitates patient care by displaying data and representing the ED in a way that makes possible the management of people in space

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[23] As Sharman (2003a) explains, the ED's open-concept design is both a blessing and a curse. The Plexiglas barriers are intended to provide visibility while protecting staff safety, as there is a history of violence against workers (which must also be perceived as a history of violence against women, given the feminization of the workforce) in the ED. The barriers make communication between staff and patients difficult, a problem often experienced by the admitting clerks. The open-concept design also compromises privacy and the workspace is very noisy, as there are few walls to muffle sound.

(assigning and/or shifting beds, prioritizing patient care based on acuity levels, etc.). It helps nurses to maintain an efficient and appropriate flow of patients through the ED (Balka et al., 2003). The system enables nurses to accomplish what Tellioglu and Wagner (1997, p. 252) refer to as "configuration management," that is, those practices used for "allocating, scheduling, aligning, coordinating, monitoring, etc. their work across boundaries." These practices are a partial response to regionalization, "the internal physical, social or organizational boundaries of a specific place" (Tellioglu & Wagner, 1997, p. 253). In a workspace of considerable organizational and physical scope, nurses in the ED must find a way to communicate, cooperate and coordinate their work across boundaries. In this regard, PCIS functions as a boundary object (Star, 1989; Star & Griesmer, 1989). Star (1989, p. 46) defines boundary objects as:

> objects that are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual site use.

The ED is a cooperative workspace situated in a complex organizational context. As a boundary object, PCIS serves an important coordinating function. It is a "method of common communication across dispersed work groups" (Star, 1989, p. 50). Triage nurses use the ED census as a means to visualize the space of the department and its inhabitants, and to communicate with colleagues and co-workers throughout the hospital. This echoes Novek's (2003, p. 383) study of technological change at a Manitoba hospital, in which "automated [drug] dispensers serve as boundary objects between nursing and pharmacy, with technological artifacts and patient databases shared between the two departments."

PCIS is a boundary object. As a technological artifact, it facilitates and organizes cooperative work, thus enabling the sharing of patient information. Like medical records, the system is a "distributing and collecting device," where work tasks begin and end (Berg & Bowker, 1997, p. 519). To acknowledge this function is to highlight the tacit aspects of technology's role in work practice. This is reflected in nurses' use of the system to spatially and conceptually organize patients. For example, nurses often refer to PCIS as a means to "keep track" of patients and information about them:

> It's to keep track of our patients and to um [pauses] I guess allow us to look at, well, their bloodwork and all that stuff. (Karen, personal communication, March 31, 2003)
>
> Keeping track of patients, where they are, um following up investigations, just basically keeping an overall tracking of where they are, what's done to them. (Karen S., personal communication, April 4, 2003)
>
> What's its job? Probably to track a patient through the system. You know, track 'em through our visits, the lab, x-rays, everything, so there's some kind of a tracking system of how long that all takes to get through that. (Monique, personal communication, March 25, 2003)
>
> I think it's just a way that the entire hospital can keep track of patients and other information. (Noel, personal communication, March 31, 2003)

PCIS makes possible the transmission of information across dispersed organizational boundaries. Nurses use the system to keep track of individual patients and often refer to them as being inside or outside the system. Comments like, "He's in the system now" (Nurse D., research participant, April 9, 2003) or "You're out of our system" (Nurse X., research participant, February 25, 2003) signify how nurses locate patients in the space of the system. These comments also underscore the need for continual engagement with PCIS, for hospital regulations

dictate that patients cannot receive care until they are registered into the system.

PCIS, and the ED census in particular, represents the space of the Emergency Department and the people in it. Patients exist in person but also in the system; they are fixed in a "machine space" (Tellioglu & Wagner, 2001, p. 169). It is a space that bounds and structures activities (Tellioglu & Wagner, 2001, p. 164). The ED census display figures into nurses' conversations about patients as they strategize the most effective and efficient means of delivering care. Triage nurses, alone or in groups, frequently consult the census to gauge current conditions in the ED. Together, they discuss patients and the allocation of beds. When talking about a specific patient, nurses will sometimes highlight the person's name on the screen. The patient, as represented in the machine space of PCIS, becomes a conversational focal point. Nurses see the ED when they look at the census. The system helps nurses to communicate patient information and serves as a means to organize the provision of care.

Nurses have little choice when it comes to using PCIS in their work practice. Organizational imperatives compel them to use the system; a patient cannot receive care without first being registered into PCIS. In this respect, data sharing is integral to patient care, for the rules of practice dictate that patients must be represented in the space of the system. As a technological artifact, PCIS functions as a boundary object and organizer of cooperative work. Nurses are compelled to use the system but also willingly (albeit grudgingly, at times) employ it, in the ways described above, as a means to facilitate patient care. It is ultimately an administrative tool, however; this categorization

fundamentally affects how nurses perceive the system. The following discussion will show how PCIS' categorization as an administrative technology is at the heart of the disjuncture between the ideological implications of the mouse pad's message and the way nurses, as frontline caregivers and users of technology, define care.

Administrative and clinical technologies

To comprehend the significance of the distinction between administrative and clinical technologies, how nurses use PCIS must be considered in conjunction with how they perceive it. Administrative technologies like PCIS are emblematic of rationalized, bureaucratized care (Choiniere, 1993; Malone, 2003). The vision of healthcare conveyed by the message, "Data sharing leads to patient caring," stands in sharp contrast to the way nurses in the ED at VGH define care as the foundation of their professional practice. Nurses do not group PCIS with clinical technology because they associate it with administrative work. The system is marked as separate from, or not directly implicated in, patient outcomes:

> It [technology] as far as nursing goes has nothing to do with the PCIS system. (Carole, personal communication, May 6, 2003)

> I don't give it [PCIS] a great deal of thought...because it's not directly related to the outcome of patients. (Jeremy, personal communication, April 25, 2003)

As an administrative technology, PCIS stands apart from the clinical technologies (such as cardiac monitors, thermometers and electronic blood pressure cuffs) nurses routinely use when caring directly for

patients.[24] PCIS' different status is attributable to how the distinction between administrative and clinical technologies is situated in relation to notions of care and norms of professional practice.

Administrative work and the "pink collar" hierarchy

The particular positioning of administrative technologies can be attributed in part to the controversial role of administrative work in nursing (Bowker & Star, 1999; Sandelowski, 2000). In Choiniere's (1993, p. 80) study of the introduction of two new administrative technologies in a Canadian hospital, she found that nurses

> expressed a sense of superiority which seemed to be based on the belief that patient care is the critical nursing function. The administrative paper-work requirements did not, according to those interviewed, substantially improve patient care.

At VGH, overworked nurses give similar priority to administrative tasks. Although they will complete the requisite administrative work, nurses highlight patient care, not "paper work" (Choiniere, 1993, p. 79) in their work processes and descriptions of the work they do. When time is short, there is no contest between paper work and patient care. Many nurses will avoid paper work if they are able to, as is the case with the task of discharging patients:

> I try to use [PCIS] as minimum as possible...so I do what I need to do for triage, for admitting. Um we're meant to discharge patients out of the system but I don't because it's a reasonably lengthy process. It's not long but in terms of how much time we have, it's long enough, so I tend to sort of rely on the unit clerks to keep it updated (Jeremy, personal communication, April 25, 2003).

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[24] From this point forward, when I use the term "technology" I am referring to administrative technology unless otherwise specified.

Nurses are supposed to discharge patients but often choose or are compelled by their workload to leave the task for one of the ED's unit clerks to complete. In so doing, nurses emphasize the prioritization of patient care over administrative work.

This is similarly reflected in the conscious though, admittedly, organizationally determined, division of labour between triage nurses and admitting clerks. As one nurse told a patient, "I'm here for your health. They're [the admitting clerks] here for all that computer stuff" (Lindsay, research participant, February 19, 2003). Over the course of my observations in the ED, I heard nurses and clerks make many variations on this statement. It is an interesting division of labour, existing as it does between nursing and clerical work, two traditionally feminized jobs (Cohen, 1994; Magill, 1995). By distancing their caring work from the clerks' administrative work, nurses establish a hierarchy in the "pink collar ghetto" (Kessler-Harris, 2003, p. 358). Though almost universally subordinate to men, all women workers in the hospital hierarchy do not occupy the same position (Ashley, 1976; Gamarnikow, 1978). Nurses construct their professional boundaries with the intention of distinguishing it from administrative or clerical work. Patient care, not paper work, is their professional focus.

Administrative tasks connote feminized clerical work. This may explain why nurses, already employed in a feminized profession, seek to distance themselves from their clerical counterparts. It is a distinction partly premised on gendered definitions of skill (Phillips & Taylor, 1980). Nurses in Choiniere's (1993, p. 79) study "did not consider any of the work required on the computer to be skilled." The ability to effectively use and navigate a system like PCIS requires users to draw on a

repository of tacit knowledge as they engage in a significant amount of invisible work, but the masculinization of technical know-how renders women's work with technology unskilled (Cockburn, 1985b; Webster, 1996). The assumption that women are 'naturally' adept at caring leads to nurses' feminized caring work being similarly stripped of skill (Finch & Groves, 1983; Reverby, 1987; Sandelowski, 2000). Nurses do not subscribe to this image of their work, however, for they are best positioned to acknowledge the skill caregiving requires. By distancing their professional identity from administrative responsibilities, nurses assert a desire for professional respect and recognition founded on a revaluation of skilled caring work.

It is essential to connect the controversial nature of administrative work in nursing to the desire for professional respect and recognition. Administrative tasks detract from direct patient care and undermine nurses' ability to assert their skill as caregivers. Administrative technologies are similarly controversial in that they represent a vision of healthcare in which nurses are increasingly called upon to manage information instead of patient care (Malone, 2003). Systems like PCIS place an additional burden of technological labour on nurses and subject them to greater scrutiny by electronically monitoring the pace and content of their work. For example, PCIS tracks the number of patients triaged per day and the length of time patients spend waiting in the ED, an indicator used by the hospital to gauge quality of care. By reducing the interaction between nurse and patient to what is essentially a running tally, these figures strip work in the ED of its complexity. They do not accurately reflect the process of caregiving. In a context of constrained or reduced funding to healthcare, organizational imperatives

continue to erode the boundaries between nursing and clerical work (Choiniere, 1993; see also Armstrong et al., 1997; Campbell, 1994). Nurses resist by objecting to the imposition of administrative tasks and by reaffirming the value of their caring work (Malone, 2003). As an administrative technology, PCIS stands outside nurses' definitions of the established boundaries of nursing care.

Visible infrastructure: Coping with technological failure

The distinction between administrative and clinical technologies is exemplified by the different ways nurses at VGH cope with technological failure. Nurses are dissatisfied with PCIS but, as the examples in this section demonstrate, feel powerless to change the system. They must contend with the repercussions of poor design on a daily basis. The workings of the system remain opaque and the expertise required to change PCIS lies in an outside department. By contrast, nurses appear more confident in their ability to cope with breakdowns of clinical technology. As with PCIS, major repair work is done by an outside department. The difference lies in the fact that nurses feel comfortable "fiddling around" with clinical technology when it does not work, a level of comfort I attribute in part to nurses' reliance on, and confidence in, their embodied caring skills.

Despite its role as a boundary object and organizer of cooperative work, PCIS tends to fade into the background for most nurses, at least until it malfunctions. This is attributable to its status as an administrative technology but is also linked to its infrastructural quality, though PCIS' poor design leaves it short of reaching the status of infrastructure (Star & Ruhleder, 1996). As a form of infrastructure, the

system is embedded "into, inside of, other structures, social arrangements and technologies" (Star & Ruhleder, 1996, p. 113). It is taken for granted, yet it "becomes visible upon breakdown" (Star & Ruhleder, 1996, p. 113). As one nurse explained, "the worst part of using a computer [is] when it's gone. You're totally stuck" (Karen S., personal communication, April 4, 2003). Another said, PCIS "seems to work pretty good until it crashes" (Nurse K., research participant, February 19, 2003). The system fails to resolve the tension between local and global (Star & Ruhleder, 1996, p. 114), and the nursing staff engage in articulation work as they use workarounds to make the system function in a way that meets their needs. For example, nurses' access to information in PCIS is determined by the level of system training they have received. If a nurse has transferred from a ward to the ED, she will not receive full access to all the ED functions in PCIS until she completes the requisite paid training session on her day off. Training is offered infrequently and at times inconvenient for shift workers. Moreover, many nurses think PCIS training is "a joke...They have to take into consideration that we're not stupid people down here" (Nurse X., research participant, February 25, 2003). Nurses work around the problem of differential access to information in PCIS by ensuring that nurses with full access remain logged into the ED computers, even though hospital policy dictates that individuals should log in and out every time they use the computer.

As an embedded, organization-scale technology, PCIS is difficult to change. The system cannot simply be taken out and repaired. It differs from clinical technologies in this regard. When a heart monitor or other clinical technology breaks down, the nurses feel confident to "fiddle

around with it" (Carole, personal communication, May 6, 2003) or "turn things on and off again" (Noel, personal communication, March 31, 2003). If that does not work, nurses call BioMed, the hospital department responsible for the repair and maintenance of clinical technologies. BioMed can remove and replace broken technologies with relative ease and they "come down pretty fast for us" (Nurse J., personal communication, March 7, 2003). Nurses' embodied caring skills leave them similarly confident in their ability to pick up where clinical technology leaves off, as will be further discussed in the following section.

PCIS, by contrast, is serviced by the Help Desk, an on-call technical help service described by one clerk as "the Unhelpful Desk...the Helpless Desk" (Clerk L., research participant, July 9, 2002). Nurses and other users of PCIS do not have the same confidence in their ability to repair or change the computer system. As there is no alternative besides returning to a solely paper-based system, users must work around the constraints of the system and use the Help Desk as a last resort. One nurse complained, "you're not treated as a priority because you're in Emergency" (Nurse B., research participant, March 20, 2003). On another occasion, two nurses working at triage described their frustration at the computers "flicking out" (i.e., timing out, a well-known and apparently unfixable glitch in the system) while they triaged patients. One of them had called the Help Desk multiple times about the problem, to no avail. In the end, her colleague decided to call them anyway, saying she would "play dumb" if the technician advised her that the Help Desk was already aware of the problem (Karen, research participant, March 31, 2003).

A third nurse wanted to change the way patients staying on stretchers in the hallway (a common experience for patients in overcrowded hospitals) were coded in the system. She wanted to change their categorization from "AAA" to "H" but faced a number of roadblocks:

> I don't know whether it's the software is a problem or what but it just seems so complicated to get things done. Like when I wanted the hallway uh put in as an extra area in the department it took them forever to figure out how to do it and then we ended up with triple A and it just became actually even more confusing...It was a bit stupid, really. Rather than just saying "H" for hallway which would make sense, you know, they couldn't do it and it just seems ridiculous that in today's technology we can't do something simple like put in a computer program that "H" is for hallway...That kind of sums up PCIS, really. (Nurse J., personal communication, March 7, 2003)

This example is indicative of nurses' frustration with the system, and their feeling of powerlessness to change it. It also locates PCIS within a wider political economy of healthcare. PCIS is an American system designed for use by providers of for-profit healthcare, later modified for use in Canada. The system is consequently not suited to VGH's needs. One person described the modified American computer system used in the ED as a "bastardized outpatient clinic" (Jennifer, personal communication, March 17, 2003). There is little in-house capacity to change the system as a result of its origins as an American-designed technology whose implementation reflected an understanding of work generated by outside consultants. When PCIS was initially implemented, "consultants came in with their knowledge, did a lot of things and then left with that knowledge...[Clinical Information Systems] was left saying, 'Okay, wait a minute, what did they do?'" (Jennifer, personal communication, March 10, 2003).

PCIS carries with it a set of power relations. Knowledge about the workings of the system, and how to change it, is not democratically distributed. There are enormous gaps between users of the system and the various groups charged with designing, implementing and maintaining it (Webster, 1996). Unlike the clinical technologies they feel comfortable "fiddling around" with, PCIS represents powerlessness to nurses. They are resigned to their incapacity to change it in order to meet their needs. Nurses cope with PCIS' shortcomings because they have no other choice. Work design dictates that they must use the system, but it cannot control whether nurses associate it with the skilled caring content of their work. PCIS consistently falls outside definitions of care because it undermines the very core of nursing by fostering a vision of rationalized, bureaucratized healthcare that strips nurses of agency and skill.

Technology and patient care

Nurses use and perceive administrative and clinical technologies differently. Variations in how nurses cope with technological malfunctions exemplify the differences between use, perceptions of, and confidence in both kinds of technology. These differences can be located in relation to the importance of caregiving in nursing, as can the associated controversies around administrative work. For reasons outlined above, nurses do not include technologies like PCIS in their understanding of care. As an administrative technology, it is a tool for information management and resource mobilization throughout the hospital, though nurses can use it to learn about patients through care

plans or alert files, and it can help nurses to provide "appropriate care" (Nurse J., personal communication, March 7, 2003).

Clinical technologies occupy a different position with respect to patient care. They are complexly situated within nursing, as discussed in Chapter Two. The nurses at VGH appear to be more comfortable using clinical technologies than they are with PCIS, most likely because of their increased feeling of expertise and control in clinical matters. When asked about the relationship between caring and technology, nurses at VGH often highlighted the role of clinical technology in the delivery of care. For them, these technologies function as a useful tool that helps nurses to provide better care with greater efficiency, a particular concern in the current climate of constrained healthcare funding.

As one nurse explained, technologies like monitors "make me feel like I'm more in control of the situation" (Carole, personal communication, May 6, 2003). Clinical technology helps you "catch something before things go really bad" (Karen, personal communication, April 4, 2003). It provides nurses with "quantitative numbers that can help you make decisions," so if there is a problem, "you can justify your actions because you've got technology to back you up" (Jeremy, personal communication, April 25, 2003). If a nurse is busy caring for multiple patients, clinical technology can extend her gaze, giving her 'eyes in the back of her head':

> [If] you're stuck behind a curtain somewhere and you really don't know what's happening with the other three patients...we can rely on the machinery to say, "Hey, come and have a look. Something's happening." And we can just go and check it out, you know. I think that's really helpful. (Nurse J., personal communication, March 7, 2003)

In this regard, technology "does make your time better spent, so you're able to spend more time with the patients" (Jennifer, personal communication, March 17, 2003). Nurses willingly turn to clinical technology as a means to facilitate the provision of care. It is a useful tool yet, as the following discussion demonstrates, norms of professional practice dictate that definitions of nursing care typically do not encompass technology, clinical or otherwise.

Nursing, technology and embodied caring work

While nurses at VGH think of clinical technology as a helpful tool, they are quick to recognize its limitations and assert the importance of their own caring skills. This affirms the profession's traditional association with care (Gaut, 1992; Gaut & Boykin, 1994). It reflects Malone's (2003) assertion that proximal nursing care is a form of resistance to the technologized distal model. Technology is a "good tool," but "it cannot be the only tool and it can't be the strongest tool" (Monique, personal communication, March 25, 2003). The strongest tools are a nurse's own embodied skills and her caring ability. As one nurse explained,

> Baseline is you always rely on yourself. Like, machines aren't perfect. You get, you know, a flat line on a machine doesn't necessarily mean your patient's flatlined. You've always got to look at the patient, but technology definitely makes it a lot easier. There's definitely a place for that. (Karen S., personal communication, April 4, 2003)

Nurses emphasize the importance of their own assessment skills because monitoring and the use of clinical technology have "to be coupled with our ability to still physically assess somebody and still be able to interact with that person" (Monique, personal communication, March 25, 2003).

If nurses "keep abusing technology" [by, for example, unnecessarily keeping a patient on a blood pressure monitor] "we'll miss the basic assessment skills that we have. We rely too much on the machine" (Nurse J., personal communication, March 7, 2003).

Nurses trust their embodied caring skills more than clinical technology because, unlike technology, their caring skills do not have the same built-in capacity to malfunction. A caregiver may become exhausted or find it difficult to care for a particularly challenging individual (Henderson, 2001) but the capacity to expertly understand the complexities of her caring ability lies within her. Clinical technology is much more opaque, and nurses rely on their embodied caring skills to validate or challenge what it tells them. This is the case when, for example, monitors fail to be a reliable indicator of a patient's condition:

> We had this younger lady in the trauma bay who had, I can't remember what she came in with, I don't know if it was a heart condition, I can't remember. Anyway, we had her on the monitor in the trauma bay and um one of the, the leads came off. Now when a lead comes off, it's supposed to go flat lined, but when this lead came off, it looked like she was in v-tac, so we were ready to, like, get this lady and, oh I remember what she came in, she came in with carbon dioxide, carbon monoxide poisoning. We were ready to, like, zap this lady and start giving her all these drugs because every time the lead came off, she went into this v-tac rhythm. Turns out that, for some reason, there was something wrong with the monitor. (Carole, personal communication, May 6, 2003)

If a monitor alarms all the time, "it's like Peter crying 'Wolf!' Very soon you're gonna ignore the alarm" (Monique, personal communication, March 25, 2003).

Nurses must use their embodied skills to verify what clinical technology tells them: "You can look on a monitor and say, 'Gee, that rhythm doesn't look right' and you haven't put your hand on the

patient's pulse. You may realize that it's the monitor that's the problem, not the patient" (Monique, personal communication, March 25, 2003). I observed this on a number of occasions, when, for example, an electronic blood pressure monitor gave a reading that the triage nurses did not agree with. In this case, the nurses used a manual blood pressure machine to get a second reading, which they thought was more accurate than that given by the electronic machine. Technology is not foolproof and it is not always reliable. Although they routinely use clinical technology in their work, nurses rely first and foremost on their embodied caring skills and their ability to use all five senses when physically assessing a patient.

Contrasting caring and technology

Nurses' reliance on their embodied skills to validate technology is connected to how their definitions of caring contrast with their definitions of technology. Technology is "cold and mechanical" and "you don't correspond it with human caring" (Carole, personal communication, May 6, 2003). Technology is about "productivity," and "I don't think productivity is about caring" (Jeremy, personal communication, April 25, 2003). Technology is scary because of "the lack of human contact...It feels very depersonalized or dehumanized" (Monique, personal communication, March 25, 2003). This stands in sharp contrast to caring, which involves "listening, talking to somebody, letting them realize that they're being listened to, trying to understand their needs and anticipate them...just being there for somebody" (Jennifer, personal communication, March 17, 2003).

The nurses I interviewed emphasized emotional connection in their definitions of care. As one nurse explained, "the most meaningful thing is the personal relationship that I have established with my patient, their family and my fellow nurses. It's not how well I use my technology" (Monique, personal communication, March 25, 2003). A very important part of caring is "just to be able to hold a patient's hand while they're gasping their last breath...you can do a lot of things but I think that the human contact, the personal touch, that is the most important part" (Jennifer, personal communication, March 17, 2003). The same nurse explained,

> I don't think anything's going to take over the human touch. I mean, I don't think we can design, well, maybe, you know, two hundred years from now we can design a computer that does everything but, I mean, can it really sit there and hold your hand when you're sick? (Jennifer, personal communication, March 17, 2003)

The emphasis on touch and emotional connections underscores the performance of emotional labour in nursing (Henderson, 2001; James, 1992). "True caring...is to really be emotionally involved. And that's hard, that's hard on me" (Monique, personal communication, March 25, 2003). Emotional labour is hard work. Like caring work, it is feminized and undervalued (Hochschild, 1983; Finch & Groves, 1983).

The nurses at VGH emphasize relationships, touch and emotional connections in their discussions of caring. It is a profoundly human exchange, not dictated by the machine relations of technology. This exchange takes place in a context where the capacity to care is continually being eroded by processes of rationalization (Armstrong et al., 1997; White, 2003). Technology, particularly the administrative kind, enables these processes (Campbell, 1994; Malone, 2003). It is no wonder

that nurses are reticent to include technology in their understandings of care. As a profession founded on physical and emotional proximity between nurse and patient, nursing is fundamentally associated with embodied care (Reverby, 1987; Sharman, 2003a). To continually assert the value of proximal nursing is to resist the rationalization of care and the associated erosion of skill and autonomy.

Gender: Shaping nurses' perceptions of caring and technology

Thus far, the findings discussed in this chapter have centred upon the complexities of nurses' relationships to and perceptions of technology. By establishing a distinction between administrative and clinical technologies, I have highlighted the contentious nature of administrative work in nursing. The assigning of administrative tasks to nurses has been criticized from within the profession, for it is asserted that these tasks detract from nursing's rightful focus, patient care (Bowker & Star, 1999; Choiniere, 1993). Nursing's emphasis on care, as evidenced by my interviewees' responses and echoed by the literature (Gaut, 1992; Gaut & Boykin, 1994; MacPherson, 1991), creates resistance to administrative work and a particular wariness of technology. This is demonstrated by nurses' frequent differentiation between their work and that performed by the admitting clerks, as well as by their avoidance of administrative tasks such as discharging patients. The organizational exhortation to share data in the name of patient care is emblematic of a vision of healthcare not shared by the nurses I encountered. For nurses, data sharing does not necessarily lead to patient care.

Caring and gender

There is a connection between how nurses conceptualize care (personal, embodied, emotional) and how they perceive technology (cold, mechanical, disembodied). Nurses engage in skilled caring work as they participate in personal, human interactions with patients. This form of skilled caring work is gendered, for nursing is a form of women's work (Cohen, 1994; Kessler-Harris, 2003). As workers in a feminized profession, gender shapes how nurses perceive the relationship between technology and care. One nurse at VGH made specific reference to women's particular capacity for caring:

> It's just a basic difference between males and females, and obviously a little bit of it is environmental, how people have been brought up, but there is a definite difference between how males and females look at the world. It's just something that is. It's like men are from Mars and women are from Venus!...If you generalize, women are much more for making everything comfortable and being more aware of the overall picture and the details, whereas the men are more, they do tend to be more tunnel-visioned. (Karen S., personal communication, April 4, 2003)

Another nurse attributed the feminization of nursing to socialization and the perception that women's nurturing ability is superior to men's:

> I think a good nurse can be male or female, but I think the way that males are brought up in our society, they're not, they don't care as openly for people and they don't do a lot of the things that need to be done and that women do. We're a lot more nurturing or whatever. (Jennifer, personal communication, March 17, 2003)

While these comments are indicative of broader gendered assumptions we are taught to make about women, men and their aptitude for particular professions, the nurses I interviewed did not make blanket claims about caring or nursing as uniquely 'feminine' domains. A number of nurses commented on their male colleagues' ability to care for

patients, though it was widely acknowledged that work in the ED is quite different from work on a ward, where patients require a lot more "pampering and poufing" (Karen, personal communication, March 31, 2003).

The difference in the content of work between wards and the ED likely has an effect on the gender division of labour, as Emergency Departments and Intensive Care Units typically have a greater proportion of male nurses on staff (Kauppinen-Toropainen & Lammi, 1993). One male nurse whom I interviewed told me about his decision to move from a ward to the ED because he does not

> feel comfortable dealing with those issues of the patient. Like being in the shower with a female or even a male, and so I don't, I just choose not to do it. I removed myself from that environment where it needed to be done. (Jeremy, personal communication, April 25, 2003)

Caring work thus has complex gendered connotations for nurses, though this may be less immediately apparent in a predominantly female workforce. When located in the context of the wider society, however, one cannot overlook the feminization of caring work and how that feminization shapes nurses' experiences and perceptions of their work (Baines et al., 1991; Finch & Groves, 1993; Reverby, 1987). To some extent, the gender composition of the nursing workforce as a whole speaks for itself. It is a type of women's work, even though men also do the job (Halford, Savage & Witz, 1997; Witz, 1992).

Gender and perceptions of technological competence

The feminization of nursing and caring work is connected to the gendering of skill and technological competence (Cockburn, 1985a, 1985b; Grint & Gill, 1995; Wajcman, 1991). When I asked nurses what

changes they would make to PCIS if they had the opportunity, a number of them said they could not answer or prefaced their response with a comment about their lack of technological knowledge. One nurse said, "I'm not that clever about the way the computer works" (Monique, personal communication, March 25, 2003). Another answered, "I don't get that involved with it to really make any recommendations and I don't know all that much about the technology side of it" (Carole, personal communication, May 6, 2003). These comments speak to the nature of PCIS, a poorly designed organizational infrastructure that nurses feel powerless to change, but also to the gender relations of technology discussed in Chapter Two. Technology is a masculine domain, and gender disadvantages women working with technology in a feminized profession (Cockburn, 1985b; Webster, 1996). Despite their complex understanding of the system's strengths and weaknesses, the nurses do not have the design expertise or technological access to change the system. Instead, they must rely on an organizational solution – the Help Desk – that many feel does not meet their needs. There is no space for nurses to effect technological change, as is particularly evident in the case of PCIS. The system is enmeshed in a broader gendered division of labour around who designs, builds, installs, maintains, and uses various forms of technology. There is little that is democratic about technological knowledge in this regard. It is a masculine domain. In the face of these challenges, the nurses devise workarounds and engage in invisible work, all in order to make the technology work for them.

In the ED, the gendered division of caring work intersects with the gendered division of technological expertise. Nurses interact with technology in the provision of care and consciously articulate a

distinction between embodied, human caring and cold, rational technology. To become professionally competent, nurses must master a range of procedures and technologies, but their skill as nurses lies in their ability to deliver embodied care. Often obscured by the hospital hierarchy, feminized caring work is nonetheless highly visible to other nurses (Diamond, 1988; Star & Strauss, 1999). This is exemplified by the emphasis on proximity and emotional connection to patients in the definitions of care reported earlier in this chapter. Nurses find meaning in personal relationships, not technological skill (Monique, personal communication, March 25, 2003). Caring work is both highly visible and highly valued in the context of nursing (Gaut, 1992; Gaut & Boykin, 1994; MacPherson, 1991). Nurses who emphasize their skills as embodied caregivers seek to disembed their "background work" (Star & Strauss, 1999).

As with their reluctance to perform administrative tasks, the way nurses define and value care is an act of resistance against a rationalized, bureaucratized vision of healthcare (Malone, 2003). This is of particular concern in a political context in which healthcare staff are working under significant constraints and technology is being introduced as a cost-cutting measure:

> We might have advanced in a lot of ways but we've forgotten about a lot of the basic stuff and we don't do well in terms of housing patients. So when they came in, if you remember all the patients lined up in the hallway, so we can, we can justify putting, you know, thousands of dollars into technology but we've still got patients lined up in the hallway. So we've forgotten about the basics. (Jeremy, personal communication, April 25, 2003)

A colleague echoed his comment when she said, "unfortunately, technology is very expensive and that cuts into a huge amount of the

health care budget" (Jennifer, personal communication, March 17, 2003). Later, she said, "we have far less beds now open and available to people than we did ten years ago." Nurses make the connection between technological solutions and healthcare funding priorities. They seek to redefine their caring work as skilled and important. To accomplish this outside the boundaries of their profession would be to overturn the gender relations on which the division of caring labour rests. Nurses' assertion of the skilled nature and importance of their caring work is both a challenge to the political economy of healthcare and gendered assumptions about the worth of women's work (Cancian & Oliker, 2000; Doyal, 1995; Navarro, 1993).

Conclusion

The mouse pad's message posits a relationship between data sharing and patient care that does not reflect caregivers' perceptions or experiences. Administrative technologies like PCIS represent a vision of healthcare founded on the rationalization of caring work. This rationalization is accomplished in part through the implementation of technologies designed to precisely account for care and caregivers. It stands in contrast to nurses' emphasis on their embodied caring work, an emphasis that should be understood as an act of resistance (Malone, 2003).

PCIS is functional in that it serves as a boundary object and organizer of cooperative work. Technological artifacts tacitly shape work practice, as evidenced by nurses' use of the ED census to visualize and organize patient care. Nevertheless, PCIS remains outside nurses' definitions of care. It is an administrative technology and thus

represents a contentious aspect of nursing work, for administrative responsibilities detract from nurses' skill as clinicians and carers. Clinical technologies thus occupy a less contentious, though certainly not neutral, place in nursing. This is evidenced by the differences in how nurses cope with the failure of administrative and clinical technologies.

Administrative and clinical technologies begin to occupy a similar space in that they both lie outside nurses' definitions of care. Although nurses acknowledge the practicality of technical tools, when defining care they emphasize their embodied caring skills. A nurse's ability to physically assess a patient is her most reliable means of validating or challenging what technology tells her. More importantly, it enables her to form a meaningful, proximal relationship with her patient. Caring is fundamentally about the formation of personal, emotional bonds between caregivers and their patients. This can be an exhausting aspect of caring work, for it requires nurses to engage in a significant amount of emotional labour.

The gendering of caring and technology affects the relationship among gender, technology and nurses' caring work. Caring is feminized, while technology is masculinized. This has particular consequences for workers in a feminized caring profession characterized by the routine use of technology. Nurses assign great value to care, a practice that differs considerably from the typical devaluation of feminized caring work. Though rendered invisible and deemed 'unskilled' by the wider society, nurses afford particular priority to embodied caring work. In this respect, they resist the devaluation and rationalization of nursing care. Nurses assert an alternative vision of healthcare, one founded on spatial

and emotional proximity (Malone, 2003) rather than the relationship between data sharing, patient care and all that it implies.

The mouse pad that inspired my thesis is a potent artifact, one that carries with it a set of meanings and implications. To answer the question, "Does using PCIS to share data facilitate patient care?" is to enter into a discussion of the roles played by, and definitions of, caring and technology in healthcare. The findings discussed in this chapter reveal the complexity of these roles and definitions, particularly with respect to the relationships among gender, technology and nurses' caring work. In Chapter Five, I will revisit my research questions in light of my findings in order to offer some conclusions based on the research and scholarship discussed in this thesis.

Chapter Five
Conclusion

In the previous chapter (Chapter Four), I reported and discussed the findings of my research in the ED at VGH. In this, the concluding chapter, I will summarize and synthesize the content of the preceding four chapters. To achieve this end, I will first revisit the purpose of my research and reiterate the research questions guiding my thesis. I will then offer conclusions based on the findings discussed in Chapter Four. Chapter Five ends with my reflections on the topic and an overview of directions for future research.

Purpose of research revisited

I chose to do research in the Emergency Department at Vancouver General Hospital because it afforded me a unique opportunity to learn from and observe women in a feminized profession working with technology. My interest is in the relationships among gender, technology and nurses' caring work, which I approach from a feminist perspective. These themes have been discussed in the literature summarized in Chapter Two, from which it became clear that insufficient effort has been made to link caring and technology in a way that captures the intricacies and inequities of the gendered political economy in which caregiving takes place. This is of particular relevance as processes of rationalization shape the priorities of health administrators and policymakers, who look more frequently to technology as a solution to healthcare's problems.

In conducting my research, I followed the methodology described in Chapter Two. It is a synthesis of three approaches to qualitative

research: grounded theory, Francophone feminist ergonomics, and feminist approaches to research and interviewing. Four research questions guided this study.

1. Did using PCIS to share data facilitate patient care?
    i. How do nurses interact with PCIS in the act of caring for patients?
    ii. How does PCIS fit into nurses broader understanding of technology's role in the delivery of patient care?
    iii. How does gender shape nurses' perceptions of caring and technology?

PCIS served as the focal point for my thesis because it is emblematic of the rationalization and technologization of healthcare. By studying it, I sought to understand the intricacies and inequities of the relationships among gender, technology and nurses' caring work as they are situated within a wider gendered political economy.

Before turning to my conclusions, I will first briefly answer my research questions. From an administrative standpoint, PCIS does facilitate patient care. Though poorly designed (and therefore not entirely suited to their needs), the system enables nurses to efficiently manage the care of multiple patients. When viewed through the lens of professional practice, however, the relationship between data sharing and patient care is more problematic. Nurses' definitions of care do not encompass PCIS because, as an administrative technology, the system is antithetical to their emphasis on proximal, embodied care.

Nurses use PCIS as a means of organizing their cooperative work. As a technological artifact, it serves as a boundary object between workers in a distributed environment. Patients are represented in the

"machine space" of the system (Tellioglu & Wagner, 2001), a representation that enables nurses to envision the space of the ED and its occupants, as well as to organize patient care. The system's scope and problematic design hinder its effectiveness, however, so nurses are resigned to working with a substandard system that does not meet their needs.

PCIS does not fit into nurses' broader understanding of technology's role in the delivery of patient care. This is attributable to its status as an administrative technology, for it stands in contrast to the clinical technologies used more directly by nurses in the provision of care. It is also linked to technology's complex and shifting relationships to nursing, for the profession is founded on an ideal of close, embodied human care that stands in contrast to the cold machine relations of technology.

Gender shapes nurses' perceptions of caring and technology on two fronts. First, the feminization of caring work has significant consequences for the professional status of nursing and the gender composition of its predominantly female labour force. Nursing resides within a broader set of gendered assumptions about the worth and value of women's caring work, as well as the levels of skill required to perform it. Second, the masculinization of technology reinforces the opposition between feminine care and masculine technology. Nurses question their own technological competence, as evidenced by the comments many nurses I interviewed made about their lack of technical knowledge. As one nurse said, "When I think of technology, I always...feel like I'm a little bit behind all the time...technology has improved my freedom and yet it has also made me feel so inadequate" (Monique, personal

communication, March 25, 2003). A male colleague, by contrast, said, "I like technology. I like toys. And it helps the patient" (Noel, personal communication, March 31, 2003). At the same time, nurses emphasize their caring skills:

> How do we measure caring? Is there a way for us to measure how, that your caring profession or your caring persona actually makes a difference in the quality of the care that people get? I believe it does, because I think that no matter what happens in this world, none of the patients out there will know whether I have a Master's or a Doctorate or whatever, but they will remember if I was kind to them, and they will remember it ten years from now, twenty years from now, that I was kind to them. They won't remember if I was smart or if I was educated or how many degrees I had or how many letters I had after my name, but they will remember if I cared about them (Monique, personal communication, March 25, 2003).

Caring is integral to nurses' professional practice, yet they work in an increasingly technological environment. As nurses are predominantly women, they are acutely affected by the masculinization of technology and technological competence. The gendering of care and technology shapes the sexual division of labour in nursing, as the disproportionate number of male nurses working in Emergency Departments and Intensive Care Units demonstrates. This gendering will likely continue to affect the profession's articulation of itself in relation to technology.

Conclusions

The title of this thesis comes from a mouse pad that is, at first glance, an innocuous object, mundane, functional and easily overlooked. Grimy from use, it sits beside a computer in VGH's hectic Emergency Department. On second glance, however, the message it conveys – "Data sharing leads to patient caring" – stands out. This phrase represents a particular vision of technology's role in healthcare. It is a vision that

must be located in the context of a system characterized by constrained funding, increased demand for care, and the search for technological solutions to the challenge of efficiently delivering quality healthcare. To administrators, perhaps, PCIS seems like the answer. It holds in it the promise of linked repositories of information, a means to communicate throughout the hospital and between healthcare facilities. This is modern healthcare! It is surely worth the price, and the trouble of negotiating a private-public partnership.

As an administrative technology, PCIS also represents the encroachment of administrative tasks on nurses' caring work. It is indicative of broader trends toward the precise categorization of, and accounting for, nurses' work as caregivers. The relationship between data sharing and patient caring is, it seems, in the eye of the beholder. If one's definition of care does not include "data sharing," the system becomes a hindrance rather than a help. That said, nurses at VGH do use the system as a tool to enable the provision of patient care. This is largely because of the fact that they are organizationally compelled to do so. Still, it is functional, in that it serves as a boundary object and a means for nurses to organize their cooperative work. As a technological artifact, PCIS becomes an asset in the management of patient care, of benefit to nurses as they care for an increasing number of very sick patients.

In the act of caring for patients, nurses interact with PCIS as a boundary object and tool for visualizing the space of the Emergency Department. Patients simultaneously fill physical space in the ED and occupy "machine space" in PCIS (Tellioglu & Wagner, 2001). Indeed, presence in this machine space is a condition of care. Despite this

function, however, nurses' definitions of the role of technology in patient care do not encompass PCIS. It is an administrative technology and thus embodies controversies around the allocation of administrative work to nurses. Administrative tasks detract from care, they do not enable it.

Clinical technologies occupy a somewhat more functional position in nurses' understanding of the role of technology in patient care. While PCIS, as an administrative technology, falls outside the boundaries of care, nurses acknowledge that clinical technologies can be useful tools. Monitors and other technologies enable nurses to care for multiple patients at the same time and can sometimes serve to validate nurses' knowledge. At other times, however, nurses must challenge what technology tells them. Monitors sometimes cry "Wolf!" The machine is not absolute or unerring, and nurses rely on their embodied caring skills to correctly gauge a patient's condition.

It is these embodied caring skills that form the core of nursing's understanding of itself. Traditionally associated with care, nurses have honed their caring skills. It is both science and art, a skill from which many nurses draw great pride. This stands in contrast to the devaluation and invisibility of feminized caring work outside of nursing. By emphasizing the importance of their caring work and the skill required to perform it, nurses resist the effects of the sexual division of labour that reduce their work to something unremarkable because of the assumption that women are 'naturally' adept at caring. As one nurse said, "[Caring] is very hard work. But it's the most satisfying work. So if I didn't care enough, I shouldn't be doing this job" (Monique, personal communication, March 25, 2003). To position their caring work above or in opposition to technology is, in some respects, to reinforce existing

gender relations. It is also to overturn them, for nurses highlight their caring work not out of deference to notions of femininity, but in order to ensure it receives the visibility and value they know it deserves. Caring is skilled work.

To assert the value of embodied care is also to challenge the implications of technologies designed to facilitate the delivery of healthcare. A heart monitor lacks intelligence, experience and discretion, while a patient information system logs only data: name, condition, test results. It is a representation that lacks richness, depth and proximity. Nurses are the repository of complex knowledge about patients and the providers of care. By affirming the importance and value of their caring work, they engage in an act of resistance against the rationalization and technologization of care. Nurses at VGH define care, and the relationships between caring and technology in their professional practice, in a way oppositional to the organizational vision of caring represented by the mouse pad's message. Broadly understood, this is an act of resistance by women workers in a feminized profession to a gendered political economy that simultaneously devalues their caring work, renders much of it invisible, and subjects what remains to processes of rationalization and technological scrutiny. The relationship between data sharing and patient care is, evidently, not as simple or natural as the mouse pad's message seeks to suggest.

Reflections and directions for future research

In nursing, caring and technology are inextricably intertwined. It is a gendered relationship and a rich site of inquiry, made richer by the diversity of individuals and perspectives within nursing. As my research

focused on a type of nursing characterized by a greater proportion of male nurses, it would be fruitful to examine how nurses outside the ED experience the relationships between caring and technology. For example, how would nurses on a ward where much physical care was required perceive the relationship between technology and care? How would this differ from the experience of Intensive Care nurses who use a significant amount of technology to care for acutely ill patients? Other points of comparison might include home care nursing or telephone nursing. It would also be relevant to expand the comparison beyond nursing to other forms of caring work, particularly those characterized by a high degree of technology use.

My research could serve as a vehicle to refine our understanding of technology's role in caring work and the importance of involving women users in processes of design, selection and implementation. As Bush (1983, p. 161) argues,

> [I]t is crucial that feminists continue to unthink and rethink the cultural contexts of technology for a reason more significant than our systematic exclusion from it: it is dangerous not to. Technology always enters into the present culture, accepting and exacerbating the existing norms and values. In a society characterized by a sex-role division of labour, any tool or technique...will have dramatically different effects on men than on women.

For this reason, we must locate technology and caring work in their wider cultural contexts and ensure that, rather than exacerbating the existing norms and values, we create new, more equitable ones.

Appendix A

SIMON FRASER UNIVERSITY

OFFICE OF RESEARCH ETHICS

BURNABY, BRITISH COLUMBIA
CANADA V5A 1S6
Telephone: 604- 291-4370
FAX: 604-291-4860

January 11, 2002

Dr. Ellen Balka
School of Communication
Simon Fraser University

Dear Dr. Balka:

Re: From Work Practice to Public Policy: A Case Study of the Canadian Health Information Infrastructure
SSHRC

I am pleased to inform you that the above referenced Request for Ethical Approval of Research has been approved on behalf of the University Research Ethics Review Committee. This approval is in effect for a period of three years from the start of the research project or for the term of your faculty appointment at SFU, whichever comes first. Any changes in the procedures affecting interaction with human subjects should be reported to the University Research Ethics Review Committee. Significant changes will require the submission of a revised Request for Ethical Approval of Research.

Best wishes for success in this research.

Sincerely,

Dr. Hal Weinberg, Acting Director
Office of Research Ethics

c: K. Messing, Co-Investigator
P. Armstrong, Co-Investigator
B. Lewis, Dean
/bjr

Appendix B

Record of On-Site Observation

Date	**Time**	**Area**	**Occupation of Person Observed** (if applicable)
Tuesday, March 26, 2002	10:30AM-11:45AM	Triage Area	
Tuesday, April 30, 2002	5:00PM-5:45PM	Triage Area	
Monday, May 6, 2002	9:00AM-11:20AM	Triage Area	Triage Nurse
Tuesday, May 7, 2002	9:30AM-3:00PM	Triage Area	Triage Nurse
Wednesday, May 15, 2002	9:00AM-11:15PM	Triage Area	Triage Nurse
Friday, May 17, 2002	9:35AM-12:00PM	Triage Area	Triage Nurse
Tuesday, May 21, 2002	1:25PM-4:30PM	Triage Area	Orderly
Wednesday, May 22, 2002	3:00PM-4:00PM	Triage Area	Admitting Clerk
Friday, June 14, 2002	4:00PM-6:30PM	Triage Area	Admitting Clerk
Monday, June 17, 2002	12:40PM-4:00PM	Triage Area	Admitting Clerk
Friday, June 21, 2002	11:10AM-3:30PM	Triage Area	Admitting Clerk
Tuesday, June 25, 2002	4:00PM-8:00PM	Triage Area	Bed Reservation Clerk
Tuesday, July 2, 2002	1:00PM-5:00PM	Triage Area	
Friday, July 5, 2002	3:30PM-7:00PM	Triage Area	
Monday, July 8, 2002	10:10AM-2:00PM	Triage Area	
Tuesday, July 9, 2002	10:00AM-2:00PM	Triage Area	Admitting Clerk
Friday, July 19, 2002	10:00AM-2:00PM	Triage Area	Admitting Clerk
Sunday, July 21, 2002	12:35PM-3:30PM	Triage Area	Triage Nurse
Tuesday, July 23, 2002	1:15PM-3:30PM	Triage Area	Triage Nurse
Friday, July 26, 2002	9:30AM-12:40PM	Triage Area	Admitting Clerk
Tuesday, July 30,	1:00PM-1:45PM	Triage Area	

Date	Time	Area	Occupation of Person Observed (if applicable)
2002			
Friday, August 2, 2002	9:40AM-12:50PM	Triage Area	Admitting Clerk
Friday, August 9, 2002	9:25AM-12:30PM	Triage Area	Bed Reservation Clerk
Friday, February 14, 2003	1:05PM-4:00PM	Triage Area	
Monday, February 17, 2003	1:30PM-4:30PM	Triage Area	
Wednesday, February 19, 2003	8:30AM-11:30AM	Triage Area	
Friday, February 21, 2003	9:25AM-12:30PM	Triage Area	
Monday, February 24, 2003	1:15PM-4:00PM	Triage Area	
Tuesday, February 25, 2003	9:00AM-12:00PM	Triage Area	
Friday, February 28, 2003	12:30PM-2:45PM	Triage Area	
Monday, March 3, 2003	8:10AM-11:10AM	Triage Area	
Tuesday, March 4, 2003	3:30PM-6:45PM	Triage Area	
Friday, March 7, 2003	6:30PM-9:30PM	Triage Area	
Monday, March 10, 2003	8:00AM-12:15PM	Triage Area	
Wednesday, March 12, 2003	11:45AM-2:15PM	Triage Area	
Friday, March 14, 2003	9:30AM-12:30PM	Triage Area	
Tuesday, March 18, 2003	9:00AM-11:30AM	Triage Area	
Thursday, March 20, 2003	9:30AM-12:30PM	Triage Area	
Monday, March 24, 2003	1:30PM-4:30PM	Triage Area	
Tuesday, March 25, 2003	2:30PM-3:45PM	Triage Area	
Friday, March 28, 2003	10:10AM-1:15PM	Triage Area	
Monday, March 31, 2003	7:00AM-10:25AM	Triage Area	
Tuesday, April 1, 2003	9:30AM-12:30PM	Triage Area	
Monday, April 7, 2003	12:00PM-2:30PM	Triage Area	

Date	**Time**	**Area**	**Occupation of Person Observed** (if applicable)
Wednesday, April 9, 2003	10:00AM-12:00PM	Triage Area	
Friday, April 11, 2003	9:30AM-12:30PM	Triage Area	
Monday, April 14, 2003	9:15AM-11:45AM	Triage Area	
Tuesday, April 15, 2003	7:50PM-9:50PM	Triage Area	
Tuesday, April 22, 2003	9:30AM-11:30AM	Triage Area	
Friday, April 25, 2003	1:35PM-4:15PM	Triage Area	
Tuesday, May 6, 2003	10:30AM-12:30PM	Triage Area	
Friday, May 9, 2003	9:35AM-11:30AM	Triage Area	

Appendix C

SIMON FRASER UNIVERSITY

Ellen Balka, Ph.D.
School of Communication,
8888 University Dr.,
Burnaby, British Columbia,
CANADA V5A 1S6

Phone: (604) 291-3764
(604) 291-3757
Fax: (604) 291-4024
E-mail: ebalka@sfu.ca

INFORMED CONSENT BY PARTICIPANTS TO PARTICIPATE IN A RESEARCH PROJECT

Simon Fraser University and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of those who participate in research. This form and the information it contains are given to you for your own protection and full understanding of the procedures. Your signature on this form will signify that you have received a document which describes the procedures, possible risks, and benefits of this research project, that you have received an adequate opportunity to consider the information in the document, and that you voluntarily agree to participate in the project.

Having been asked by Dr. Ellen Balka, of the School of Communication of Simon Fraser University, or one of her research assistants or collaborators, _____ (named here), to participate in a research project, I have read the procedures specified in the document INFORMATION SHEET FOR SUBJECTS: **From Work Practice to Public Policy: A Case Study of the Canadian Health Information Infrastructure.** I understand the procedures to be used in this research, as well as the potential risks and benefits to me in taking part in this research.

I understand that if I consent to participate in this project that I may withdraw my participation in this project at any time.

I also understand that I may refuse to participate in this project and that if I do refuse to participate in this project that there will be no repercussions for such a refusal.

I have been informed that research material (answers to questions I have been asked and, in the event that I have consented to have photographs or videotapes taken of me, any photographs or videotapes taken of me) will be kept confidential by Dr. Ellen Balka, to be used only by staff and research collaborators involved with this project.

I understand that that if I consent to being photographed or videotaped that images resulting from these photos or video tapes may be shown to those participating in this research at Simon Fraser University, and may be used to communicate research results to scholarly audiences, unless I indicate to the researcher(s) after being photographed or videotaped that I do not want images of me used for the purposes of communication of research results.

I understand that my supervisor or employer has granted permission to Dr. Balka's research team to conduct the study described on the INFORMATION SHEET FOR SUBJECTS: From Work Practice to Public Policy: A Case Study of the Canadian Health Information Infrastructure, but

that I may still choose not to participate in this study.

I understand that I may register any complaint I might have about the project with the researcher named above, or with Dr. Martin Laba, Director, School of Communication, Simon Fraser University, Burnaby, B.C. V5A 1S6 (e-mail laba@sfu.ca).

I may obtain copies of the results of this study, upon its completion, by contacting:

Ellen Balka, Ph.D.
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I agree to participate by:	YES	NO
• answering questions about my use of technology in a work setting;	___	___
• having answers to questions about my use of technology tape recorded;	___	___
• allowing the researcher(s) to observe my use of technology in a work setting;	___	___
• allowing the researcher(s) to capture my use of technology in a work setting via video camera;	___	___
• allowing the researcher(s) to take photos and/or videos of the area surrounding the technology in my work setting:	___	___

during the period from January 2, 2002 through December 31, 2003.

I wish to have my identity remain anonymous: ___ ___

If you would like to have your identity remain anonymous, what pseudonym should we use in referring to you or your interview in future presentations or publications?

I would like to be referred to in the context of this research as _____

NAME (please type or print legibly): _____

ADDRESS: _____

_____

SIGNATURE of participant: _____

WITNESS: (type or print) _____ **SIGNATURE** _____

DATE: _____ **PLACE:** _____

ONCE SIGNED, A COPY OF THIS CONSENT FORM AND A SUBJECT FEEDBACK FORM SHOULD BE PROVIDED TO THE SUBJECT.

_____

Facility/ Unit::_____ Form #_____ BU:_____

SIMON FRASER UNIVERSITY

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INFORMATION SHEET FOR PARTICIPANTS

This form describes processes to be used in studying the use of information technologies in health sector work settings.

Title of Project: From Work Practice to Public Policy: A Case Study of the Canadian Health Information Infrastructure.

Project description:

The study described here has been designed to find out about how staff are experiencing information technologies in the health sector, and to learn more about the organizational and institutional contexts into which new information technologies are being introduced in the health sector. We are interested in:

- learning about the reasons for introducing information technology in the healthcare industry,
- what kinds of issues arose during the design and implementation of information technology systems in the health sector,
- identifying any problems (including health and safety problems) that have arisen after the introduction of new information technology in the health sector,
- determining if information technologies are being used the way designers thought they would be used, and, if they are not being used the ways that system designers thought they would be, what factors are contributing to differences in design ideals and actual use.

We are seeking participants for this study. If you agree to participate, we would like to observe you as you do your job, and periodically ask you to explain why you have done things in a particular way. As we develop an understanding of how you use technology in your job, we may ask you to review written or video-taped materials we prepare, and tell us if they provide an accurate reflection of your work, from your perspective. We may also ask to interview you in order to learn more about issues arising in relation to information technology in your work.

If you agree to participate, your identity will not be revealed to anyone outside of the research project, unless you have granted permission to have your identity revealed. If you agree to allow us to videotape you while you are working, Images from tapes will only be used for research purposes. You will be able to give us permission to use images from the tapes in presentations or publications, or you will be able to withhold permission to use those images outside of our research laboratory. You will also be able to withdraw from the study at any time.

Procedures to be followed by researcher(s):

Researcher(s) will observe you doing your normal job, and, in the course of those observations, may ask you to explain why you do some of the things you do. Researchers may also ask you to answer questions from time to time, and, if there are health and safety issues in your workplace, you may be asked to respond to a survey or participate in other activities aimed at assessing ergonomic risks associated with your job. You will have an opportunity to refuse to participate in any or all of the research activities described here, and you may withdraw your consent to participate at any time.

Notes taken during the research process, any audio or video tapes compiled during the research process, and any photographs taken as part of the research will be kept in a locked research facility accessible only to researchers at Simon Fraser University. In the event that any research participants request anonymity, they will supply a pseudonym to the researcher(s) that will subsequently be used in the recording of any data.

Visual Data (photographs and videotapes of users) will be viewed by research staff, and if permission has been granted to do so, may be used in scholarly presentations and publications. Visual data will not be used for any purposes other than as part of the research described here, or to communicate research results at scholarly conferences. Research participants who consent to being photographed or videotaped may at any point revoke that consent.

Refusal to participate:

I understand that there will be no repercussions in the event that I refuse to participate in this study.

Risks to research Participants:

Persons agreeing to participate in this research may feel self-conscious or uncomfortable being observed or video-taped. People being video-taped following the procedures outlined here often forget the camera is recording them after a short time. Research participants may find talking about their workplace use of information technology challenging, or it may be a pleasant and rewarding experience.

Benefits to the research community:

Information from this study will assist researchers in understanding how new information technology is changing jobs in the health sector, and whether or not new technology is improving work and/ or leading to improvements in the delivery of health services. It is anticipated that information gained from this study may be of interest to policy makers, health sector workers, systems designers, administrators and the general public.

For further information, please contact

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FORM #4

SIMON FRASER UNIVERSITY
UNIVERSITY RESEARCH ETHICS REVIEW COMMITTEE

PARTICIPANT FEEDBACK FORM

Completion of this form is **OPTIONAL**, and is not a requirement of participation in the project. However, if you have served as a participant in a project and would care to comment on the procedures involved, you may complete the following form and send it to the Chair, University Research Ethics Review Committee. All information received will be treated in a strictly confidential manner.

Name of Principal Investigator: Dr. Ellen Balka

Title of Project:
From Work Practice to Public Policy: A Case Study of the Canadian Health Infrastructure

Dept./School/Faculty: School of Communication, Simon Fraser University, Burnaby, B.C. V5A 1S6.

Did you sign an Informed Consent Form before participating in the project? _____ (Yes or No)

Were there significant deviations from the originally stated procedures? _____ (Yes or No)

I wish to comment on my involvement in the above project, which took place:

_____
(Date(s)) (Place) (Time)

Comments:_____
_____
_____
_____
_____
_____
_____
_____

Completion of this section is optional

Your name: _____

Address: _____

Telephone: (w)_____ (h)_____ E-mail:_____

This form should be sent to the Chair, University Research Ethics Review Committee, c/o Office of the Vice-President, Research, Simon Fraser University, Burnaby, BC, V5A 1S6.

Appendix D

Interview Log

Date	Interview Subject	Occupation
Friday, March 7, 2003	Nurse J.	Charge Nurse
Monday, March 17, 2003	Jennifer	ED Clinical Analyst
Tuesday, March 25, 2003	Monique	ED Nurse Clinician
Monday, March 31, 2003	Noel	Triage Nurse
Monday, March 31, 2003	Karen	Triage Nurse
Friday, April 4, 2003	Karen S.	Triage Nurse
Friday, April 25, 2003	Jeremy	Triage Nurse
Tuesday, May 6, 2003	Carole	Triage Nurse

Appendix E

Interview Questions

PCIS: Strengths and Weaknesses

1. What is PCIS meant to do?
2. Does PCIS work the way it is supposed to? Why or why not? Give examples.
3. What are the strengths of PCIS? Give examples.
4. What are the weaknesses of PCIS? Give examples.
5. If you could change anything about PCIS, what would you change? Why? Describe the changes that you would make.
6. Describe the ideal patient information system. How would it work? What would it do? What wouldn't it do? Who would design it?
7. Were you involved in the design or implementation of PCIS? What is your impression of the design and implementation process?

Technology

1. What you think of technology, what comes to mind?
2. What kinds of technologies do you use in your work as a nurse?
3. Do these technologies always function the way they are supposed to? When they don't, what do you do? Give examples.
4. If you could change the technologies you use in your work, what would you do? Which technologies would you change? Why? Give examples.
5. Would you like to use more or less technology in your work? Why?

Technology & Care

1. What is the relationship between technology and care?
2. How do technology and care complement each other? How do they conflict?
3. Does technology help you to care for patients? If so, how and when? Does technology ever get in the way of the provision of care? If so, how and when?
4. Is it possible to design a "caring technology?" What would it look like? What would it do?

Care & Nursing

1. When you think of caring, what comes to mind?
2. What does caring mean to you as a nurse?
3. How does caring shape nursing's philosophy?
4. Is the care you give to patients different from the care you give to your loved ones? How?
5. What is the relationship between caring and curing?
6. Do doctors care for patients? If so, does the care they give differ from the care given to patients by nurses? How?

Care & Gender

1. Is there a difference between women's caring and men's caring? Who is better at caring? Why?
2. Is care feminine or masculine? Neither?
3. Is nursing feminine or masculine? Neither?

Appendix F

Coding Categories[1]

Actors

- Micro
- Meso
- Macro

Work Practice

- Invisible Work
  - Articulation Work
  - Workarounds

Professional Practice

- Actor Networks

Technology

- Context and Situated Use
- Technology Design

Gender

- Workplace Gender Relations

Work Process

Work Design

Ergonomics

- Constraints
- Occupational Health and Safety

Artifacts

Texts

Conflict

Structuration

- Institutional Structures
- Occupational Structures

Commodification

- Patterns of Ownership
- Profit
- Accountability

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[1] These coding categories were co-authored with Dr. Ellen Balka and Brandi Bell as part of the SSHRC-funded project, "From Work Practice to Public Policy: A Case Study of the Canadian Health Information Infrastructure." The categories are used by permission.

Spatialization

- Geography
- Organizational Motivations

Public Policy

- Standards

PCIS

Caring Work

Technology and Care

Perception of Technological Competence

Technological Malfunctions

Medical Division of Labour

The Emergency Department as Information Booth

Safety and Security in the Emergency Department

Flow

Indicators

Skill

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