

# "You Think it is Turning But it is the Multiple Small Stuff"

## Gender, the Division of Labour and Musculoskeletal Injury Among Nursing Staff

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*Les infirmières dans les hôpitaux souffrent de douleurs dans le dos et dans les épaules attribuées aux efforts fournis pour soulever et repositionner les patients. Une recherche rapporte ici d'autres facteurs responsables comme des postes qui demandent des postures gênantes, le manque de respect des membres du personnel et le contrôle limité sur l'environnement jouent un rôle prépondérant dans les accidents de dos et d'épaules chez les infirmières.*

Between 1999 and 2003 back strain and other strain were the cause of the greatest number of compensated injuries in British Columbia. Of the 6,926 workers' compensation claims paid out in the health sector in 2003, 61 per cent were classified as "over-exertion, bodily motion claims" which is the classification under which lifting injuries (as well as several other types of over-exertion injuries) appear. Although the injury rate<sup>1</sup> in the health care and social assistance sector has fallen since 1999 from six to four in 2003, injuries caused by over-exertion represented 61 per cent of compensated claims in 2003 (Workers' Compensation Board of B.C 2003) and remain a source of concern.

In 2003, women experienced 89.3 per cent of compensated injuries in British Columbia's health sector and acute care sub-sector, 89.7 per cent of all injuries caused

by exertion in the health sector, and 89.9 per cent of all injuries caused by exertion in the acute care sector.<sup>2</sup> Across the health sector the greatest number of over-exertion injuries occurred within the assisting occupations (which include nurses' aides and orderlies). However, within the acute care sector, which accounted for 43.6 per cent of over-exertion injuries in the health sector in 2003, nurses (excluding nursing aides) experienced 52.4 per cent of over-exertion injuries, which represented 22.8 per cent of all health sector over-exertion injuries in British Columbia in 2003.<sup>3</sup>

Health sector work in general and nursing work in particular are predominantly female occupations. In Canada, 93 per cent of the nursing labour force is female (Government of Canada). Nursing is a high risk occupation for low back pain (Hignett; Miller) and shoulder injury (Myers *et al.*), which are often thought to be caused by moving patients in their beds and moving them in and out of beds (referred to as patient handling) (Hignett; Hignett and Richardson). Vancouver Coastal Health reported that between 1997 and 2001, injuries attributed to patient handling across British Columbia's health sector accounted for approximately one-third of time loss claims filed

by health sector workers.

The high costs associated with nursing injury in recent years have focussed attention on both the causes of nursing injury, and the prevention of nursing injury. Patient handling is widely cited as the major cause of musculoskeletal injury and particularly back injury among health sector workers (Yassi *et al.*; Main; Engst *et al.*; Miller; Hignett; Hignett and Richardson), and is often the focal point of interventions aimed at mitigating the risk of back injury in the health sector. The desire to reduce staff injuries is frequently cited as the reason for purchase of mechanical patient handling lifts by health care facilities (Main; Ronald *et al.*; Vancouver Coastal Health). In light of the view that patient handling is the predominant cause of back and shoulder injury among nurses and other health sector workers, it is not surprising that patient lifts have been widely adopted as a solution to the high injury rates among nurses.

In 2003, 14 mechanical ceiling mounted lifts to assist with patient handling were installed in the intensive care unit (ICU) of Vancouver General Hospital, and 325 ceiling mounted lifts were installed and ready for use in a new building when it opened in May 2003. Several stakeholders including

Vancouver Coastal Health's Occupational Health and Safety (OHS) staff, the Musculoskeletal Injury Prevention team (MSIP), and the Occupational Health and Safety Agency for Healthcare (OHSAH) shared interest in evaluating use of the lifts, and a desire to document a relationship between the use of these lifts and a reduction in inju-

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ries. Within this context, we undertook a study of nursing work at Vancouver General Hospital that had among its goals the evaluation of the newly implemented ceiling lifts.

In this paper we provide an overview of our research design and outline our main study findings.<sup>4</sup> Our data suggest that although patient handling certainly contributes to musculoskeletal injury among nursing staff, these injuries may be over-attributed to patient handling. Our findings demonstrate that nursing staff are exposed to frequent awkward postures as they perform a variety of nursing tasks unrelated to patient handling, and that the prevalence of exposure to frequent awkward postures may contribute to over-exertion injuries among nurses in acute care settings. We discuss our findings in relation to gendered views of work, including stereotypes about "light" and "heavy" work (Messing, Chatigny and Courville 451-452).

### **Research Design**

We conducted a multi-method study of nursing work which included a survey of staff prior to the use of ceiling lifts,<sup>5</sup> preliminary observations of patient handling activities performed by nurses, physiotherapists, and orderlies, the administration of body map questionnaires to staff engaged in patient handling, detailed observations of nursing work during eleven full nursing shifts, and short interviews with 88 staff members.

Our field study was based on the methods of analysis of work activity developed at The Centre for the Study of Biological Interactions in Human Health (CINBIOSE). This approach looks at work activity in terms of balancing the demands of the job and the constraints the worker faces, with the worker's capacities, health, and well being (Messing and Seifert 98).

The CINBIOSE approach typically begins with a request by workers or unions (see Messing and Seifert; Messing 1999). In contrast to this approach, our request came through management, who had already defined the problem as patient handling and the solution as the use of ceiling lifts, requiring us to modify the CINBIOSE methodology. Reflecting the means through which we gained access to our study site, our initial research focused on observations of patient handling strategies and techniques, and patient handling aids. We quickly realized that patient handling occupies a relatively small portion of nurses' total work time (<5 per cent), and found that nurses reported many additional sources of musculoskeletal strain unrelated to patient handling. As a result we expanded our observations to look at nursing work as a whole, shadowing nurses for entire shifts and thereby observing both what has been termed "light" and "heavy" work (Messing, Chatigny and Courville).

Initially our study began in the Intensive Care Unit (ICU) because it is known to have particularly high injury rates, and the ICU was the first unit to receive ceiling lifts. Once staff began using ceiling lifts following the opening of the new building, we began interviews and observations on those units as well.

### **Methods**

Outlines of the human body (body map questionnaires) were distributed to all ICU staff involved with patient handling in order to capture the difference in pain levels from the beginning to the end of a 12-hour shift. Informal interviews were conducted with staff while the body maps were distributed, through which comments were elicited about which aspects of their work contributed to the increase in pain by the end of the shift.

In addition to informal interviews conducted with ICU staff during the administration of the body map questionnaires, we also separately visited all units in the new hospital building equipped with ceiling lifts, and interviewed 88 staff about patient handling activities and sources of musculoskeletal strain and injury in the workplace.

### ***Preliminary and Detailed Observations***

We observed all types of patient handling and recorded the type of transfer (reposition, bed to stretcher, bed to neurochair, bed to wheelchair), number and job category of staff involved, positions of staff at the bedside (e.g., were they positioned at the head of the patient or on the side of the patient), type of equipment used (transfer board, sliding sheet, floor lift, ceiling lift, none), approximate size of the patient and staff involved, type of equipment connected to the patient and amount of time required for the patient handling task.

Although patient handling related injuries are a serious concern and a definite cause of injury in nurses (Hignett; Yassi *et al.*; Main; Engst *et al.*; Miller; Hignett and Richardson) our preliminary observations and comments from nurses suggested that other sources of musculoskeletal strain and potential stressors within the work environment should also be considered. As one nurse commented, "You think it is turning [patients] but it is the multiple small stuff." Nurses told us about other activities—such as changing the bed and crushing pills—that they identified as causing strain in their daily work. Our preliminary observations of nursing work supported this claim, and left us wondering about the extent to which non-patient handling tasks might contribute to back and shoulder injury. This prompted us to look more broadly than patient handling activities in our efforts to identify factors contributing to the high rates of musculoskeletal injuries among nursing staff.

Using a handheld digital assistant and a software package called Actopalm, we developed data capture screens that allowed us to collect very detailed information about nursing activities and the basic postures used during those tasks. Based on the most common musculoskeletal injuries for nurses and data from our body map questionnaires, we focused our detailed observations on basic postures at the lower back, neck, and shoulders. Two researchers shadowed a single nurse during full 12-hour shifts, and collected detailed data on the units via data entry into our programmed handheld digital assistants. One researcher recorded basic postures of the back and neck while the other recorded basic postures at the right and left shoulders. Both researchers simultaneously recorded the tasks the nurse was performing, which were subdivided into categories of commu-

nication, direct patient care, organization, and technology use. Detailed data collection was performed for seven 12-hour shifts in the ICU, and four 12-hour shifts on other hospital wards where patient handling is also particularly challenging (the acute medical unit, spinal unit, neurosciences unit, and orthopaedic trauma unit). Data were subsequently uploaded to a computer using Actogram 1.1 software, and analysed to determine the percentages of time spent in each activity and body position as well as the frequency of awkward postures during each nursing task.

### Findings

By superimposing all the body map questionnaires for the beginning and end of ICU shifts, composite body maps were created. A notable increase in pain levels was demonstrated from the beginning to the end of the 12-hour nursing shifts, with a concentration of pain around the lower back, shoulders, neck and head. This finding correlates with feedback from nurses during informal interviews, and led us to focus our detailed observations on basic postures at the lower back, shoulders and neck.

Feedback from nurses about the ceiling lifts was generally very positive, including comments that the lifts are "sometimes a great help for heavy lifting," are "saving a lot of the backs," and "I think it's the greatest—my back is not as achy—I love the lifts." Although at times nursing staff found it easier to reposition patients without the ceiling lifts (e.g., when a patient was quite small), which is consistent with other findings (Engst *et al.*), they did tend to use the ceiling lifts for patient transfers and repositions unless mechanical assistance was contraindicated (e.g. patients with recent spinal injuries). Nurses in general were quite satisfied with the ceiling lifts and reported a strong

preference for the ceiling lifts over the previously available floor lifts.

Data is not yet available to determine whether the implementation of ceiling lifts at Vancouver General Hospital has contributed to a reduction in musculoskeletal injury among nurses.<sup>6</sup> The decision to install ceiling lifts was based on the common belief that patient handling is the major contributor to musculoskeletal injury among nurses. Transferring and repositioning patients are certainly significant contributors to musculoskeletal injury among patient care staff, yet our data suggest that other characteristics of nursing work may be under-recognized as factors contributing to musculoskeletal injury.

Awkward postures are defined by the Workers' Compensation Board of British Columbia as "postures that require any part of the body to be positioned outside its neutral position" (2005: 49). Detailed observations of nursing activities and the basic postures adopted during those tasks found that a greater number of non-neutral postures of the back and shoulders occurred

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during non-patient handling activities than during patient handling (Figure 1). For example, more time was spent in awkward or non-neutral postures while bathing the patient and injecting medications than during patient handling. Although an awkward posture by it-

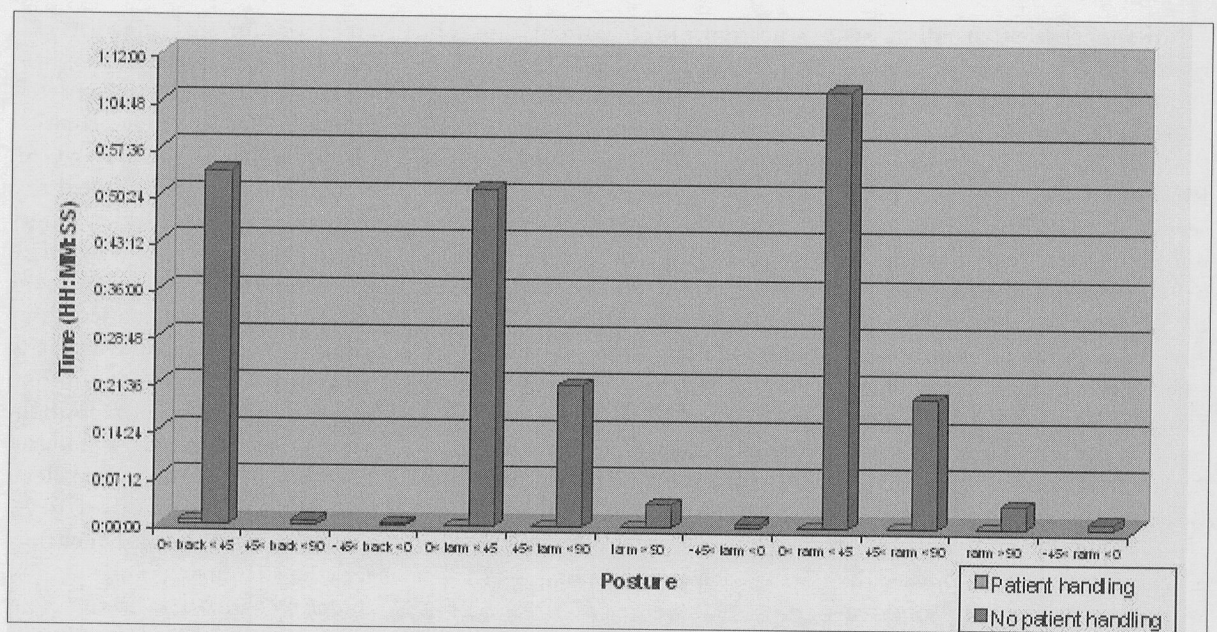


Figure 1: Non-neutral postures of the back and shoulder during patient handling and non-patient handling activities

self may not present a risk of musculoskeletal injury, “the risk of musculoskeletal injury increases significantly when awkward postures combine with other risk factors, most notably force and repetition over prolonged periods” (Workers’ Compensation Board of B.C. 2005: 49).

Our detailed observations suggest that non-patient handling activities (such as changing the bed, crushing pills, and squatting to change heavy dialysis bags) expose staff to awkward postures with greater frequency than patient handling activities, and hence may play a greater role in musculoskeletal injury among nurses than previously recognized.

Preliminary analysis of data from other sources lends credence to these findings. For example, when data from the British Columbia Workers’ Compensation Board’s Traumatic Injury database were disaggregated,<sup>7</sup> it was found that patient handling rarely accounted for much more than 50 per cent of compensated injury claims for any health sector occupation type within the acute care sector in any of the years from 1999 to 2003, and often accounted for less than

50 per cent of compensated injury claims, particularly from 2001 to 2003 (Table 1).

Our data based on detailed observations of nursing work suggests that exposure to awkward postures occurs with greater frequency when nurses are engaged in non-patient handling activities than when they are engaged in patient handling activities. In the Workers’ Compensation Board of British Columbia data presented in Table 1, the columns for other accident type include injuries classified as overexertion during non-patient handling activities (during which awkward postures may or may not have occurred), repetitive strain injuries, injuries while the staff maintained a static posture (with or without applied force, during which awkward postures may or may not have occurred), and all other injuries not attributed to patient handling (such as falling and environmental hazards). It is difficult to make a direct correlation between the Workers’ Compensation Board data and our observations, since the posture at time of injury is not recorded on injury claims, and thus accident type classifications do not indicate whether or not an awkward pos-

ture contributed to the injury. However, looking at the percentage of compensated claims classified as patient handling related injuries from 1999 to 2003, 46 to 66 per cent of compensated claims for registered nurses, registered nursing assistants, nurse aides, and orderlies are the result of injuries attributed to factors other than patient handling. Although patient handling activities clearly play a significant role in compensatable injuries, the data above suggest that perhaps patient handling injuries play a somewhat lesser role than is often cited.

During our data collection period on the ICU we observed that physiotherapists engaged in frequent patient transferring activities, and some of our earlier observations—which included shadowing a physiotherapist in the ICU—suggested to us that physiotherapists may engage in patient handling with greater frequency than nursing staff. Looking at Table 1, physiotherapists have the highest proportion of patient handling related compensation claims for all years except 2002. This is consistent with our observations in the hospital; physiotherapists appear to

engage in more patient handling (particularly patient transferring) than other direct patient care staff groups, thus it is not surprising that a higher proportion of their injuries would be attributed to patient handling.

From our observations, nursing work as contrasted to physiotherapy work is characterized by numerous constraints not experienced by physiotherapists. Nurses experienced frequent interruptions and a lack of control over their daily schedule, as activities to be performed by other professionals often took precedence over nursing tasks. Nursing staff reported a heavy and increasing workload, particularly with recent cutbacks, accompanied by high mental load and emotional strain. Because most nurses work long 12-hour shifts and a combination of day and night shifts, we constantly observed nurses trying to trade shifts with each other in order to accommo-

date work schedules with their personal lives. Furthermore, nursing tasks other than patient handling—for example when working within the space constraints at the bedside—required the adoption of more awkward postures than physiotherapy tasks other than patient handling.

Given the different constraints on nursing work, it is not surprising that a higher proportion of nursing injuries are attributed to sources other than patient handling. This suggests that sources of injury other than patient handling may be particularly present in nursing work.

### Discussion

Nurses spent a relatively small percentage of their total work time in patient handling activities, which are widely accepted as the primary source of musculoskeletal strain and injury for this profession. Although

patient handling related injuries are a serious concern, sources of musculoskeletal strain such as bending to accommodate unmoveable equipment, reaching for awkwardly placed equipment such as overhead monitors that are too high, and other potential stressors within the work environment should also be considered. The pace of nursing work was constant, and nurses faced multiple demands and little recognition of their work; these characteristics are typical of work that has high demands and low control or decision latitude, and are widely recognized as contributors to poor worker health (Josephson *et al.*; Ahlberg-Hulten *et al.*; Balka).

Research undertaken by Madeleine Estryn-Behar *et al.* (49-50) focused on working conditions of female hospital workers and addressed the cumulative load of nursing work tasks (e.g. making beds or pushing beds, as well as patient handling, standing for long peri-

**Table 1: Compensated Injuries Among Different Healthcare Staff Groups in the Acute Care Sector in British Columbia, 1999-2003<sup>8</sup>**

Staff Group	Percentage of claims for 1999		Percentage of claims for 2000		Percentage of claims for 2001		Percentage of claims for 2002		Percentage of claims for 2003	
	PH*	OAT*	PH	OAT	PH	OAT	PH	OAT	PH	OAT
Physiotherapists	63.64	36.36	54.55	45.45	54.17	45.83	27.27	72.73	53.33	46.67
Registered nurses	50.87	49.13	46.24	53.76	43.25	56.75	43.47	56.53	42.73	57.27
Registered nursing assistants	51.80	48.20	53.85	46.15	48.14	51.86	43.36	56.64	50.93	49.07
Nurse aides and orderlies	47.32	52.68	44.94	55.06	43.63	56.37	38.29	61.71	34.23	65.77

\*Patient handling    \*\*Other accident type

ods, bending and maintaining uncomfortable positions), and found that musculoskeletal disorders were twice as frequent amongst women who were exposed to more than one of the conditions studied.

Although the strong link between patient handling and injury in nursing is commonly made, our data is consistent with other studies that recognize the contribution of additional factors (Goncalves *et al.*; French *et al.*; Harber *et al.* 1987a, 1987b; Ahlberg-Hulten *et al.*), as well as Audrey Nelson *et al.*'s suggestion that it is a myth that high risk tasks in nursing are restricted to patient handling. Awkward positions such as leaning over the patient, stooping and squatting have been identified as contributing to back pain (French *et al.*). As described by Philip Harber *et al.*, common nursing tasks "such as leaning over the side rail of a patient's bed to adjust flow rate through an intravenous catheter, often require prolonged maintenance of an awkward, antigravity position" (1987b: 973). Our findings are consistent with these studies as well as Nelson *et al.*'s suggestion that many nursing tasks may have to be performed while bent forward with the torso twisted, and expose nurses to risk of back injury. Our data also support Nelson *et al.*'s claim that "most injuries in nursing are due to cumulative trauma—that is, injuries occur slowly over time because of repeated musculoskeletal stress" (37).

Gendered social relations of work and gendered views of work provide a starting point in making sense of our data. Sue Harding distinguishes between three aspects of gender: i) gender structure, or the sexual division of labour (men and women are situated in sex typed ways); ii) gender identity or individual gender (how others see us in gendered terms, and how we view ourselves as gendered beings), and iii) gender symbolism, a fundamental category within which meaning

and value are assigned to everything in the world (57). The health sector labour force is a largely sex segregated labour force, with several occupations such as nursing filled largely by women. At a cultural level gender identity suggests that women are ill suited to heavy work, and that lifting patients is heavy work. Gender symbolism attributes greater value and risk to jobs dominated by men (such as mining work), and arguably has influenced how injury is viewed and how claims are paid in the workers' compensation system.

Patient handling, which would be classified as "heavy" work, or work involving more extreme physical demands (Messing, Chatigny and Courville), is widely recognized as a source of injury in nurses. Because patient handling is commonly recognized as a cause of musculoskeletal injury, these injuries are compensated and are targeted in injury prevention programs. However other nursing activities that would be classified as "light" work, tasks often characterized by repetitive movements and flexed postures but involving little force (Messing, Chatigny and Courville), are much less readily recognized as sources of injury.

The lack of value that society places on "light" work in general may also lead to an under-reporting of injuries in this category, because staff themselves may share the perception that such tasks do not or should not result in injury. Historically women's occupational health injuries such as injuries resulting from repetitive work have been invisible to occupational health research and workers' compensation claims; women's occupational health problems have been both under-reported and under-compensated (Messing 1995). As Karen Messing states "the health risks in women's jobs are usually hidden, both because visible risks are a reason for exclusion and because women's health problems are

often ascribed to weakness or hysteria" (1995: 181). A study of the work activity of female train cleaners, for example, identified physical demands such as prolonged awkward postures and long travelling distances and found that the physical strain produced by this work was vastly under-recognized (Messing; Messing, Doniol-Shaw and Haëntjens). This suggests that the percentage of health sector injuries resulting from "light" work (such as changing the bed or crushing pills) may be underestimated, because such work is not recognized as physically demanding and therefore injuries are more likely to be unreported or uncompensated, or possibly attributed to heavy work such as lifting.

## Conclusion

Historic views based on the prevalence of occupational injury among men that echoed their greater presence historically in the paid labour force laid a foundation for the equation of heavy work with musculoskeletal injury. This view permeates views of nursing injury even today, and influences our understanding of causality within health sector occupational injury such that "the small stuff" is often ignored.

Considered "heavy" work, patient handling has been the focus of injury prevention and intervention, whereas other "lighter" forms of nursing work, such as tasks that require awkward postures, have received less consideration. Furthermore, secondary analysis of data available through the Workers' Compensation Board of British Columbia revealed that non-patient handling related injuries often account for 50 per cent or more of injuries for health sector workers. Results from our secondary data analysis suggest that cultural views of gender identity and gender symbolism influence not only how we view work, but also



influence our approach to the interpretation of data and data analysis, which, if left unquestioned, may perpetuate gendered views of work.

Failure to address women's occupational health issues specifically has resulted in a lack of recognition, research and treatment for women's occupational injuries. For example, there is a perception that "heavy" work assigned to men and associated with accident events is more difficult and strenuous than "light" work assigned to women. Cumulative trauma injuries such as those discussed here occur slowly over time because of repeated musculoskeletal stress in many jobs occupied by women in a sex segregated labour force (Punnett and Herbert). Until all demands and constraints on work activity are addressed, not just those related to activities which are typically performed by men, there will be a serious impact on women's health and well-being.

*We are grateful to Karen Messing who provided ample guidance as we learned to use the method outlined here, and who has reviewed and discussed our findings at various stages of data collection. Many thanks to Susan Bradley for administrative support throughout the project. We would like to acknowledge the Occupational Health and Safety Agency for Healthcare for financial support.*

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<sup>1</sup>Measured as number of claims per 100 person-years of employment.

<sup>2</sup>Data derived from Workplace Traumatic Injury Report database, accessible through <https://online.worksafebc.com/anonymous/WebRpt2/WebRpt.aspx>.

<sup>3</sup>Data derived from Workplace Traumatic Injury Report database, accessible through <https://online.worksafebc.com/anonymous/WebRpt2/WebRpt.aspx>.

<sup>4</sup>A more complete overview of our study findings can be found in Mason, Servane and Ellen Balka. "ICU Ceiling Lift Report." 2004. Available from authors.

<sup>5</sup>Those data are omitted here as a post-use survey has not yet been undertaken.

<sup>6</sup>Existing hospital data sets do not include information about the number of staff employed by specific units—staffing level data is collected by managerial unit and managerial units do not correspond to hospital wards, making it impossible to determine the number of staff employed by each unit. Consequently, no denominator data are available. We know that the absolute number of back and shoulder injuries has gone down, but we do not know if the injury rate has gone down.

<sup>7</sup>Looking at the data available via the web-based interface to the Workers'

Compensation Board's Traumatic Injury Report database (<https://online.worksafebc.com/anonymous/WebRpt2/WebRpt.aspx>) we wished to investigate further and contacted Noemi Altamarino at the Workers' Compensation Board, who graciously filled our request for more detailed data than we could access through the web interface to the database. Our findings are summarized in Table 1. <sup>8</sup>Table 1 shows the percentage of Workers' Compensation Board of B.C. (WCB) compensated claims for several direct patient care occupations within the acute care sector. For each year, claims have been divided into the percentage of compensated injuries attributed to patient handling versus the percentage attributed to other accident types. Note that claims were classified into accident types by WCB. Percentages are displayed because of difficulty obtaining data regarding the number of staff and numbers of hours worked in each occupation group (thus injury rates could not be presented as the number of injuries divided by the number of staff and hours worked for each staff group).

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