Operating Room Safety

The incidence and impact of injuries in the O.R.
Introduction

Hospitals represent one of the most hazardous working environments in the United States. According to the United States Bureau of Labor Statistics, hospital employees suffer work related injuries at nearly twice the national average (Fig. 1). Injuries and illnesses resulting in missed work are particularly costly to employers, and these types of events occur in the hospital amongst nursing aides, orderlies, and attendants at nearly four times the national average (4.4 injuries per 100 full-time workers; (Fig. 1.)

Hospital Workplace Injury Statistics

- **6.8 work-related injuries /100 FTE (1.9x private industry rate)**

- **48% of all injuries among hospital workers are due to overexertion and bodily reaction**

- **8/10 nurses say they frequently work with musculoskeletal pain**

- **58,860 - Number of work-related injuries and illnesses that caused employees to miss work**

- **Operating room staff (nurses and aides) have some of the highest rates of injury resulting in both no days away (10.11-17.58) and days away from work (12.52-15.71 injuries/100 FTEs)**

Figure 1. Hospital Workplace Injury Statistics

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**Financial Impact to the Hospital**

The financial impact of such injuries on the healthcare system is significant, with the average cost to hospitals for worker’s compensation claims exceeding $15,000, resulting in a total cost to the healthcare system of $2 billion annually (Fig. 2). In addition to the direct costs associated with workplace injuries, there are additional, indirect costs including employee turnover, training of new employees, productivity, and morale. Estimates of the cost to replace nurses who leave the hospital can range from $27,000 to $103,000.

<table>
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<tr>
<th>Financial Impact</th>
<th>Affected Area</th>
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<tr>
<td>$22,300</td>
<td>Average cost to hospitals for workers compensation claims involving lost time</td>
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<tr>
<td>$2 Billion</td>
<td>Workers compensation associated healthcare costs</td>
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<td>$27,000 - $103,000</td>
<td>Cost to replace lost staff</td>
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<tr>
<td>24%</td>
<td>Percentage of nurses and nursing assistants reported changing shifts or taking sick leave to recover from an unreported injury</td>
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*Figure 2. Hospital Workplace Injury Statistics*
Operating Room Safety

Incidence of Workplace Injuries

Within the hospital, nearly 48 percent of all reported injuries involve overexertion and bodily reaction and 80% of nurses reported having frequently worked with musculoskeletal pain. The operating room in particular presents an increased risk of injury to employees, with operating room staff (nurses and aides) having some of the highest rates of injury resulting in both no days away (10.11–17.58 injuries /100 full-time employees) and days away from work (12.52 – 15.71 injuries / 100 full-time employees).³

Several studies have been performed to quantify the incidence of work-related injuries amongst operating room staff, including surgeons, nurses, and aides. The results of these studies indicate that musculoskeletal disorders are amongst the primary injuries reported in this population. In one study of perioperative personnel in the Netherlands, the incidence of musculoskeletal pain in the preceding year and its impact on the ability of personnel to perform work was examined.⁴ The most frequently reported type of pain amongst all respondents was back pain (58%) followed by pain in the neck/shoulder (53%), headaches (48%), and legs/feet (43%) (Figure 3). The incidence rate of musculoskeletal pain in each part of the body was higher than that of the general population and overall, 16% of study participants reported calling in sick to work due to musculoskeletal pain. Some of the reasons for the high rate of musculoskeletal pain were attributed to prolonged standing, awkward positioning during surgical procedures, and holding equipment (e.g. retractors, instruments) for long periods during surgical procedures.⁴

A similar study conducted looking specifically at operating room nurses found that back, ankles/feet, knees, neck, and shoulder was prevalent in greater than 50% of the study population (Fig. 3) in the previous 12 months, with the vast majority of the population (85.7%) experiencing some type of musculoskeletal pain. This pain resulted in 38.5% of OR nurses having to visit a physician for their symptoms and 25.1% of OR nurses studied reported taking medical rest for their symptoms.⁵

Musculoskeletal pain is not limited to OR nurses and staff who spend their time assisting the surgeon, but is a very real concern amongst surgeons themselves. Many surgeons have experienced work-related injuries that result in taking leaves of absence, undergoing medical treatment or surgery, or even retiring earlier than planned.⁶ A systematic review and meta-analysis of 24 studies surveying 5152 surgeons evaluating musculoskeletal symptoms and ergonomic outcomes found that 68% of surgeons reported having generalized musculoskeletal pain, with pain in the back (50%), neck (48%) and arms or shoulders (43%) being the most frequently reported locations of pain (Fig. 3).⁶ Further, 71% of surgeons experienced fatigue from working and 45% reported having stiffness after operating. Overall, 61% of surgeons reported that their pain was exacerbated by operating and 30% of surgeons took into account their own physical symptoms when recommending a surgical approach for their patients.⁶
Incidence of Pain

Figure 3: Musculoskeletal disorders. Percentage of incidents of pain for O.R. nurses, surgeons, and O.R. staff.
Ergonomics in the O.R.

The high incidence of musculoskeletal injuries among surgeons and operating room staff can result from a myriad of factors including manual handling (e.g. lifting patients, equipment or instruments) and stress (e.g. prolonged standing, awkward postures, and retraction). In particular, inappropriate working postures may contribute to the development of musculoskeletal disorders. Abdollahzade et al. conducted a study aimed at examining the working posture of operating room nurses in various activities (table set-up, transferring sets and retraction) using the Rapid Entire Body Assessment (REBA) method, which is a validated observational tool for assessment of whole body musculoskeletal disorder risk. The working posture of nurses is in need of drastic improvement, with 62.6% of nurses being at a high or very high risk for developing musculoskeletal disorders based on the REBA score. In particular, nurses in cardiac, gynecology, and orthopaedic operating environments were at a significantly greater risk for development of musculoskeletal disorders compared with other operating specialties. The findings of this study combined with the overall high incidence of musculoskeletal pain resulting in treatment and missed work in operating room surgeons and staff indicate that operating room personnel are exposed to a high level of physical ergonomic risk factors that need to be considered in order to mitigate the risk of injury.

Rapid Entire Body Assessment

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Figure 4: Rapid Entire Body Assessment
The Walter Difference

The WalterLorenz Surgical Assist Arm is a bionic, electromechanical arm that enables surgical site optimization. The Arm was created in collaboration with surgeons across multiple disciplines to assist with visual access, flexibility, and efficiency during surgical procedures. The Arm is designed to retract tissues with steady pressure, potentially alleviating the retraction burden and associated ergonomic/injury risks to the surgeon and operating room staff. By providing a stable platform, the Arm may help to reduce fatigue and stress in operating room personnel and allow for reallocation of staff for more critical tasks to enhance operative efficiency and safety.

References

1. Worker Safety in Your Hospital. US Department of Labor, Occupational Safety and Health Administration.
2. Safe Patient Handling Programs: Effectiveness and Cost Savings. US Department of Labor, Occupational Safety and Health Administration
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