



Original contribution

# “Are We hurting ourselves?” What is the prevalence of back pain in anesthesia providers? ☆



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## Abstract

**Study objective:** Back injuries are a highly reported category of occupational injury in the health care setting. The daily clinical activities of an anesthesia provider, including lifting, pushing stretchers, transferring patients, and bending for procedures, are risk factors for developing low back pain. The purpose of this study is to investigate the prevalence of work related low back pain in anesthesia providers.

**Design/setting:** We conducted a cross-sectional survey study of anesthesia providers at an academic institution.

**Patients:** The target population included all 141 clinical anesthesia providers employed by the Penn State Milton S. Hershey Medical Center Department of Anesthesia.

**Interventions:** A survey study was conducted using the Oswestry Disability Index (ODI), a validated scoring system for low back pain. Additional questions related to the daily activities of clinical anesthesia practice were also asked. The survey instrument underwent pretesting and clinical sensibility testing to ensure validity and consistent interpretation.

**Measurements:** The primary self-reported measures were the prevalence of low back pain in anesthesia providers and an assessment of disability based on the ODI. Secondary functional measures included the impact of low back pain on work flow.

**Main results:** Nearly half (46.6%) of respondents suffer from low back pain attributed to clinical practice. In this subset of respondents, 70.1% reported *not* having back pain prior to their anesthesia training. Of those with low back pain, 44% alter their work flow, and 9.8% reported missing at least one day of work. Six

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providers (5.3%) required surgical intervention. Using the ODI score interpretation guidelines, 46% of respondents had a “mild disability” and 2% had a “moderate disability.” Respondents reporting feeling “burned out” from their job had a significantly higher average ODI score compared to those who did not (6.8 vs 3.3, respectively;  $P = .01$ ).

**Conclusions:** Nearly half of all anesthesia providers sampled suffer from low back pain subjectively attributed to their clinical practice. This leads to changes in work flow and missed days of work. The results of this study suggest a deficiency in the effectiveness of anesthesia training programs in teaching proper techniques to prevent musculoskeletal injuries.

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## 1. Introduction

Back injuries are a highly reported category of occupational injury in the health care setting. They occur at nearly twice the frequency as in other service industries [1]. According to United States Census data, nurses have a higher prevalence of work related back pain (all types of back pain) than men working construction jobs [2]. Lifting patients is frequently cited as the underlying mechanism of injury. Low back pain is a common condition among physicians in general, and has been studied specifically in surgeons [1,3-5]. The daily tasks of an anesthesia provider, including lifting, pushing stretchers, transferring patients, and bending for procedures are all potential risk factors for developing low back pain. To date, no studies have been conducted to directly assess the prevalence of low back pain in anesthesiologists. We incorporated the Oswestry Disability Index (Mapi Research Trust, Lyon, France), a validated scoring system for low back pain, into a survey administered to anesthesia providers at a large academic medical center, to determine the prevalence and effects of low back pain attributed to the clinical practice of anesthesia.

## 2. Materials and methods

This survey study was deemed exempt for review by the Penn State Hershey Medical Center Institutional Review Board. The primary aim of the study was to determine the prevalence of low back pain in anesthesia providers. Secondary aims were to identify: associations between demographics and low back pain, the effect of back pain on work flow, and the relationship between injury prevention training and low back pain disability scores. Various characteristics of back pain in anesthesia providers were investigated using the Oswestry Disability Index (ODI) version 2.1.a (written permission obtained from the Mapi Research Trust, Lyon, France). The ODI, a scoring system for low back pain, was initially published in 1980 and has since undergone several modifications [6]. The content, construct, clinical applicability, and ability of the survey to detect change have been validated in several studies since its inception [7-13]. The ODI elicits information on the effects of low back pain on lifestyle by asking questions in 10 domains including: pain intensity, personal care, lifting, walking, sitting, standing, sleeping, sex life, social

life, and traveling. These 10 domains are scored from 0 to 5 by the respondent. The sum of the scores for each domain results in the total score, with 50 being the highest possible sum. The ODI, expressed as a percentage, is then calculated by the following formula:  $((\text{Summed score})/(\text{number of domains answered} \times 5)) \times 100$ . Interpretation of the ODI score (in terms of degree of disability) is based on a range of percentiles [Table 1]. To further address the research questions, the survey contained additional queries related directly to the practice of anesthesia. Demographic information, detailed pain histories, injury prevention training, and work flow changes were among the items addressed in the 22 additional questions.

To ensure we developed a robust and validated survey instrument, we conformed to the standards of Bryson et al. [14] in their publication “The Science of Opinion: Survey Methods in Research.” [14] First, a detailed literature search was conducted and unambiguous primary and secondary research goals were identified. The *observation unit* in this study was defined as an individual anesthesia provider at an academic medical center. The *target population* of the study was all 141 clinical anesthesia providers (faculty, residents, and nurse anesthetists) employed by the Penn State Hershey Medical Center Department of Anesthesia as of 6/30/2013. Physicians practicing exclusively chronic pain were excluded. All clinically active members of the department were offered the survey, therefore the *sampled* and *target* populations were the same. The instrument was pre-tested in individuals similar to the target population to ensure the questions were consistently interpreted. These individuals included external anesthesiologists and non-anesthesia physicians. Their feedback was used to clarify and simplify some of the questions. Clinical sensibility testing was also conducted to assess the comprehensiveness, clarity and validity of the questionnaire [14,15]. A standardized, structured form was used to elicit participants’ opinions on content, wording, and importance of questions asked.<sup>2</sup> The survey was then administered in accordance with the recommendations of Bryson et al [14]. All potential respondents received advanced notice via email explaining the purpose and timeframe of the study. Initial non-respondents received two additional email reminders. Respondents were

<sup>2</sup> Structured form used is available at [http://www.cmaj.ca/content/suppl/2008/07/24/179.3.245.DC1/guide-burns-appendix\\_1.pdf](http://www.cmaj.ca/content/suppl/2008/07/24/179.3.245.DC1/guide-burns-appendix_1.pdf) (last accessed 01/24/2014).

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