in fractures were being struck by falling objects (19.7%), struck by slipping handheld objects (11.8%), and falling from a ladder (6.6%). Falling objects were most frequently pipes and ducts, beams, and structural slabs. Hammers, powered drills and jackhammers were the most frequently noted slipping handheld objects. Work on ladders and lifting or loading/unloading materials operations were among the activities in which workers with the longest disability durations were engaged.

Discussion: These findings illustrate the importance of incorporating narrative text analysis and pursuing more granular level assessments of coding in large datasets to better refine our understanding of traumatic injury events such as fractures in construction.

H1.4
Title: Relationships Between Medical Care and Paid Lost Time From Work After Work-Related Back Injury Among Washington State Union Carpenters
Authors: **Kucera KL**, Lipscomb HJ, Silverstein B

Introduction: Back injuries cause significant lost work time in construction. Beyond older age, differentiating those at risk of prolonged lost work time is difficult. We examined relationships between medical care provided for work-related back injuries due to overexertion and time off work among a cohort of carpenters.

Methods: Union records identified a dynamic cohort of 20,642 union carpenters who worked in Washington State from 1989–2003. These data were linked to Department of Labor and Industries workers' compensation files; data from this state-run program included records of medical care with diagnoses and provider type. Patterns of care received were examined by paid time loss status.

Results: Over 75,000 visits for medical care were identified over 15 years resulting from 2959 back injuries. Chiropractors (37%) and primary care providers (33%) were most frequent first providers followed by specialists (10%) and hospital/ER (9%); number of lost days differed significantly by first provider ($p < 0.05$). Thirty-eight percent of those out 31–90 days and 24% out > 90 days never received physical therapy (PT). Individuals out of work for > 90 days were less likely to see a PT in the 30 days post injury (prevalence ratio = 1.7); mean days to first therapy increased with increasing time away from work (25, 50, and 114 days, respectively, for < 30 days, 30–90 days and > 90 days). Mean number of PT visits in the 30 days after injury was greater among those out longer.

Discussion: Differences in cases based upon treatment in the first month after injury are worthy of further exploration. Although seeing a specialist as first provider was associated with delayed time away from work, being seen in an ER was not. Individuals with prior history of back problems may seek specialist care immediately after injury.

Session: **H2.0**
Title: Injury Experience of Public Safety Workers
Moderator: Anita Schill

H2.1
Title: Evaluating the Ambulance Patient Compartment as a Work Environment Using Digital Human Modeling Tools
Authors: **Ammons D**, Green J, Isaacs A, Moore P, Whisler R, White J

Introduction: Seat belts provided in most U.S. ambulances today do not allow emergency medical service (EMS) workers the mobility required to care for patients. As a result, EMS workers routinely work unrestrained in the patient compartment, daily risking their safety and health in the care of others. The use of mobile restraints, as previously tested by NIOSH, or the redesign of the workspace, as was done by the Winter Park (Florida) Fire and Rescue Department, offer opportunities to improve worker safety.

Methods: This research used digital human modeling tools to evaluate reach in both of these unique work environments. A matrix was developed to test three digital human body sizes, in two different work environments, each outfitted with two different restraint types: one fixed and one that allowed mobility. Each digital human then attempted to grab five different patient or equipment targets while remaining restrained. The underlying premise is that it is better to be restrained than unrestrained, and further, it is better to be restrained and seated than restrained but out of the seat.

Results: This study confirmed that severe limitations exist in today's ambulance environment as workers cannot reach the patient, or needed equipment, using the restraints provided. While mobile restraints offered a viable solution to this problem, the current configuration requires the worker to move substantial distances from the safety of the seat. The reconfigured workspace offered the worker a greater opportunity to

remain seated during patient care tasks though it alone did not solve all reach issues. With the addition of mobile restraint technology the models demonstrate the value of both changes.

Conclusions: Incremental improvement in worker safety can be achieved through innovative uses of mobile restraint systems in conjunction with the thoughtful placement and positioning of the worker, patient, and patient care equipment.

H2.2
Title: Occupational Injury Experiences of EMS Providers
Author: **Heick RJ**

Introduction: Occupational injury is a significant problem among emergency medical service (EMS) providers, affecting their ability to perform their duties. A national survey was conducted to describe the problem of occupational injury among EMS providers.

Methods: This study examined the most common types of nonfatal injuries and the activities and environments where injury most frequently occurred. This study also examined the impact of multiple variables on odds of occupational injury.

Results: Occupational injury in the last 12 months was reported by more than 29% of 660 survey respondents, with multiple injuries reported by 64% of those reporting an injury. Paid providers had higher odds for overall injury (1.83, 95% CI 1.25–2.66) versus volunteers. A positive association was found between the number of calls responded to per week and increasing odds of overall injury. Paid providers also had higher odds for back injury (1.94, 95% CI 1.03–3.66) versus volunteers. Odds for overall injury and back injury were not affected by age, gender, length of service, or number of calls per week. Motor vehicle crashes were reported by 7% of paid and volunteer EMS providers, with all reported injuries occurring among paid providers. Odds of involvement in a motor vehicle crash did not vary significantly by paid versus volunteer status (1.08, 95% CI 0.55–2.10). One hundred forty-seven respondents reported physical assaults while working. No significant difference was found between paid and volunteer providers for occurrence of physical assault (1.21, 95% CI 0.74–1.97) or injury from assault.

Discussion: The results of this study indicate that occupational injury among EMS providers is indeed a serious problem. This study clearly identifies a variety of injury issues, including the need to examine paid and volunteer providers as separate occupational groups when developing prevention programs.

H2.3
Title: Occupational Safety and Health for Public Safety Employees: Assessing the Evidence and Implications for Public Policy
Authors: LaTourette T, Loughran D, **Seabury S**

Introduction: The provision of public safety is one of the most important responsibilities of government, and workers charged with protecting the public, such as police officers and fire fighters, are routinely asked to put their own lives at risk. As such, it is no surprise that public safety employees face much higher than average fatal and nonfatal occupational injury rates.

Methods: This work provides an in-depth study of the adverse health risks facing public safety employees. We combined in-depth literature reviews and new data analyses to characterize the types, causes, frequency, and severity of different injuries and illnesses suffered by public safety employees of different ages. This work was complemented with a series of roundtable discussions with numerous safety personnel to better understand the opportunities and challenges facing policies intended to reduce injuries and illnesses among police officers and fire fighters.

Results: An important goal of policymakers is to determine ways to help protect public safety employees from work-related injury and illnesses without compromising their ability to do their work. However, achieving this goal is hampered by a lack of solid information on the causes and consequences of adverse health events experienced by safety personnel.

Discussion: Using these findings, we discuss what is currently known about the different health risks facing safety employees and examine how well safety and health promotion policies align with these risks. Finally, we discuss the current gaps in our knowledge base and provide some guidance for future research. The research was cosponsored by the California Commission on Health and Safety and Workers' Compensation and the National Institute for Occupational Safety and Health.

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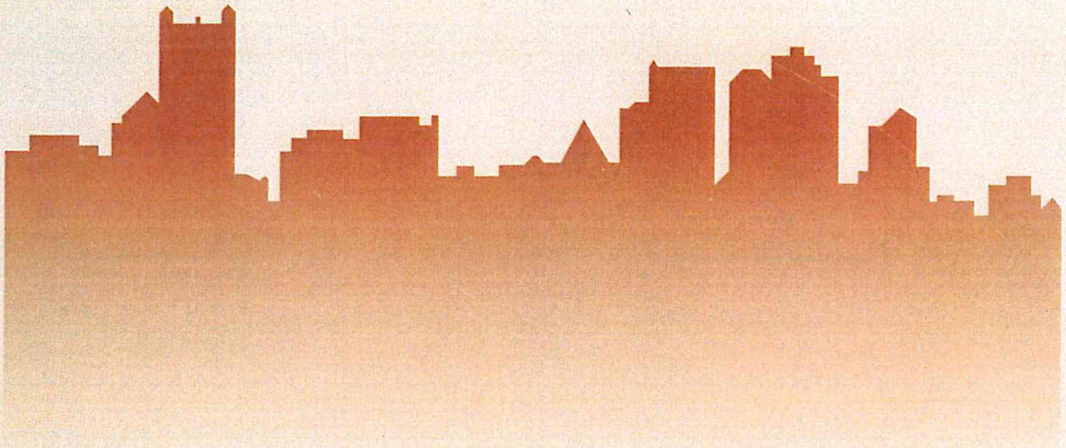

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