

**Title:** Occupational Hand Injuries of Workers in Connecticut

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## **Background**

The implementation of safety policies in certain occupational categories (coal miners, construction, farmers, roofers, trucking, forestry, maintenance, manufacturing, waste management) have helped to significantly decrease the rate of injury and fatalities. However, hand injuries remain one of the most common injuries observed in these occupations. We focused on workers' compensation patients and paid close attention to specific injury subtypes. To our knowledge there are very few publications that have evaluated occupational hand injuries related to co-morbidities, injury types, age distribution, and time frame in certain occupations that have come through the emergency setting. Therefore, the aim of this study is to review data from the EPIC EMR databases of the emergency room setting at our level 1 trauma center, and study hand injuries seen in modern high-risk occupations to clarify such injuries and help treat these at-risk patient populations.

## **Methods**

We examined 930 cases of workers' compensation, occupational-related injuries that were seen in our emergency room from 2016-2019. As a retrospective study, we harvested data from the Hartford Hospital EPIC EMR database to investigate related injuries. The sample includes patients of either gender, age 18 and older with no upper age limit, who presented to Hartford Hospital's emergency room from 8/20/16 to 8/31/19 with hand injuries or complaints due to their occupation. We only included patients under workers' compensation as their injury related to their job duty. Patients with the diagnosis codes of ICD-10 S60-S69 were included. We evaluated patient demographics, mechanism and type of injury, and patient outcomes from individuals who have been seen at Hartford Hospital ER.

## **Results**

- Sample included 930 workers' compensation occupational-related injury cases; there were 883 different workers involved; 44 had multiple (2 or 3) occurrences
- Timeline: data collected from August 2016- August 2019
- Gender Distribution: Male: 620 (67%) Female: 310 (33%)
- Age – median age was 35; the age range distribution: 18-39 (558), 40-59 (298), 60 and older (74)
- Injury type: any type of fractures of the hand were the most common (120, 12.9%) of which 94 were displaced fractures (10.1%); these were followed by amputations (47, 5.1%), of which 27 were complete amputations (2.9%); crushing injuries (34, 3.7%), and dislocations (10, 1.1%)
- In addition, 382 (41.1%) had laceration, 194 (20.9%) puncture wound, 64 (6.9%) sprain, 58 (6.2%) contusion, and 51 (5.5%) abrasions
- The index finger 44.3% (220/497) was the most common finger injured, followed by the middle finger 27.6%-(137/497).
- 13/930 had bilateral hands injured, 58/930 had multiple parts of the hand injured, 54/930 had multiple fingers injured.
- 36/930 were admitted from the ER to the hospital for their injuries, 8/930 were discharged from the ER to outpatient observation and 886/930 were discharged home.
- Male patients were significantly more likely to have experienced amputations ( $p = .006$ ) and or fractures ( $p < .001$ ), injury to multiple parts of the hand ( $p = .035$ ) or multiple fingers ( $p = .007$ ) and were twice as likely (4.8% to 1.9%) to be admitted than females ( $p = .03$ ).

- Age was significantly related to having experienced fractures (displaced or any type) ( $p < .001$ ) with 24.3%/18.9% of patients in the oldest group age 60 and older, 17.4%/14/4% of patients aged 40-59 and 9.0%/6.6% of those 18 -39 having a displaced fracture/any fracture.
- The likelihood of having a multiple finger injury also significantly increased with age with 4.1%, 7.7% and 10.8% for the three age groups ( $p=.016$ )
- Timeline
  - By year
    - 22.22 injuries averaged per month in 2016,
    - 25.25 per month in 2017
    - 26.41 per month in 2018
    - 26.25 per month in 2019
  - Hand occupational injuries were highest during the month of August, and lowest during the month of March.
  - Weekend days (Saturday/Sunday) lower than week days (Monday-Friday)

## Conclusion

This study was initiated because of concern about the safety of workers in certain occupations in Connecticut and the significance of hand injuries pertaining to workers being an overwhelming number of patients that are seen here in Hartford, CT. Hand injury patterns must be studied in order to improve safety. By analysis of the hand injuries that have been seen and have been treated in our Hartford Hospital ER, we have identified the most common types and with this information we can further justify improvements in safety and the techniques that are needed for these occupations in the workplace, as well as the treatment and evaluation of these injuries by physicians and hospital staff in the hospital setting.

\*Please consider the following abstract for the H.Kirk Watson, M.D. Founder's Award