

Title: Injuries From The Use of Home Tools: A Recommendation for Improved Upper Extremity Protection

Authors: Armin Palic, BS, Evan Sirls, BS, Alex Joo, BA, Douglas M. Rothkopf, MD

Purpose:

The use of hand held home tools (gardening diggers, power drills, jackhammers, etc.) is extremely common with both recreational and practical purposes. Safety equipment for these tools is typically targeted towards shielding the hands, in the form of protective safety gloves; however, these do not provide protection proximal to the hand (PtH). The purpose of this study is to optimize safety practices by identifying the distribution and prevalence of tool injuries in the upper extremity unprotected by safety gloves.

Methods:

Patients were identified using the National Electronic Injury Surveillance System (NEISS) and were consecutively enrolled from January 31st, 2011 to December 31st 2021. Patients were included in the study if they were evaluated in the emergency department (ED) for an injury related to the use of hand operated home, garden, or workshop tools. Prevalence of wrist, forearm, elbow, upper arm, and shoulder injuries were calculated as primary outcomes. Secondary outcomes included patient demographics, distribution of injuries on the upper extremity, and most common injury types. Descriptive statistics of primary and secondary endpoints were determined.

Results:

A total of 35,876 upper extremity injuries presented to the ED within the last ten year period. Of those, 6,159 injuries occurred on the wrist (1,673, 4.7%), forearm (2,299, 6.4%), elbow (520, 1.4%), upper arm (419, 1.2%), or shoulder (1248, 3.5%), for a prevalence of 17.2%. Of all upper extremity injuries, 1,133 were treated and admitted for hospitalization, with 309, or 27.3%, of these hospitalizations coming from injuries PtH. The most common PtH injuries were lacerations (1,916 patients). Abrasions, burns, and laceration injuries made up 20.0% of all PtH injuries.

Conclusions:

The prevalence of upper extremity injuries unprotected by safety gloves, relative to all upper extremity injuries, is 17.2%. These injuries make up an even greater proportion of patients hospitalized with upper extremity injuries, with a prevalence of 27.3%.

20.0% of all UE injuries come from PtH injuries that would be preventable by protective clothing (abrasions, burns, and lacerations) designed to extend proximal to the hand.

With this high prevalence, there is a need for safety equipment to address more of the upper extremity, particularly the forearms and wrist.

Manuscript

Introduction:

Proximal to hand (PtH)

Methods:

Prevalence and proportions were analyzed using a Chi-squared test.

Results:

From 20XX-20XX, a total of 35,876 upper extremity injuries were reported through NEISS-participating EDs. The average age was 42.7 years, with 89.0% of patients identifying as male ($n = 31,953$). The most common location for injury was at home (92.8%, $n = 21,612$) ([Figure 1](#)).

Of the 35,876 upper extremity injuries that presented to the ED, 6,159 injuries occurred proximal to the hand, accounting for a prevalence of 17.2%: wrist (1,673, 4.7%), forearm (2,299, 6.4%), elbow (520, 1.4%), upper arm (419, 1.2%), and shoulder (1248, 3.5%). Of all upper extremity injuries, 1,133 were treated and admitted for hospitalization, with 309, or 27.3%, of these hospitalizations coming from injuries proximal to the hand.

The three most common tools causing upper extremity injuries were table saws

2022 NEHS Annual Meeting Abstract Submission

COMPLETE

NEHS Vice President, Daniel Mastella, M.D., is currently accepting abstract submissions for presentation at our Annual Meeting on December 2, 2022.

This meeting will be held at the Sturbridge Host Hotel in Sturbridge, MA.

Therapists, NPs, and PAs are also encouraged to submit.

THE DEADLINE FOR SUBMISSION IS OCTOBER 15, 2022

RESIDENTS AND FELLOWS ONLY. Please indicate if you want your paper to be considered for the prestigious H.Kirk Watson, M.D. Founder's Award. The abstracts for award consideration will be presented in the morning and the award will be presented in the afternoon.

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* ABSTRACT TITLE

Injuries From The Use of Home Tools: A Recommendation for Improved Upper Extremity Protection

* Contact Person Name

Armin Palic

* Contact Person Email

* Contact Person Phone Number

* Name of who will present abstract at NEHS meeting on December 2, 2022 Please note that the same person cannot present more than one abstract at the meeting.

Armin Palic

* Please indicate if the presenter is:

Not currently a resident or fellow

* List full names of abstract authors

Armin Palic, BS, Evan Sirls, BS, Alex Joo, BA, Douglas M. Rothkopf, MD

*** ABSTRACT - should include background information and a description of methods, programs, or practices.**

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*** Please attach the abstract presenter's CV**

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