

# National Trends for the Practice of Utilizing Prophylactic Antibiotics in Pediatric Nail Bed Injuries

Lillia Steffenson<sup>1</sup>, Ann Schwentker, MD<sup>2</sup>, Kevin Little, MD<sup>3</sup>

<sup>1</sup>University of Cincinnati College of Medicine; <sup>2</sup>Division of Plastic Surgery, <sup>3</sup>Division of Orthopaedic Surgery, Cincinnati Children's Hospital Medical Center

## Introduction

Crush injuries to the nail bed have traditionally been treated with prophylactic antibiotics after repair, according to principles of open fracture treatment. Infection rates following crush injury to the fingertip range from 4% to 6%.<sup>1-2</sup>

However some studies have suggested that antibiotic prophylaxis may not reduce infection rates for pediatric patients with nail bed injuries. The goal of this study was to evaluate the current trends in practice for antibiotic prophylaxis in pediatric patients with crush injuries to the fingertip.

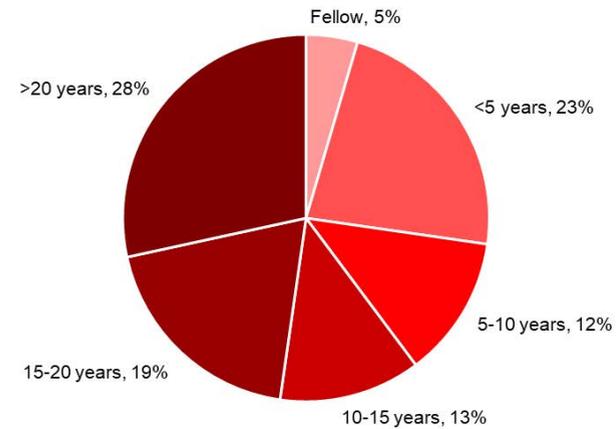
## Method

Survey data was collected anonymously from AAHS members who completed an online survey. Questions inquired about the presentation of a pediatric patient with crush injury to the fingertip—indicated below by (...)—followed by additional information regarding the patient presentation. Respondents were asked to indicate what, if any, antibiotic prophylaxis they would recommend for each scenario.

- Question 2. (...) and **subungual hematoma** involving **less than 50% of the nail** without skin laceration.
- Question 3. (...) and **subungual hematoma** involving **greater than 50% of the nail which required trephination of the nail**. There is no laceration to the skin.
- Question 4. (...) and subungual hematoma involving greater than 50% of the nail **which required nail removal, repair of nailbed laceration, and reapproximation of eponychial fold**.
- Question 5. (...) and subungual hematoma involving greater than 50% of the nail with **radiographic evidence of a fracture** of the distal phalanx...which required nail removal, repair of nailbed laceration, and reapproximation of eponychial fold followed by splinting.
- Question 6. (...) **in a clean environment** (hinge of a door for example) **with displacement of the nail bed**, laceration of the skin, and radiographic evidence of a fracture of the distal phalanx...which required thorough irrigation, repair of the skin laceration with sutures, and reapproximation of eponychial fold followed by splinting.
- Question 7. (...) **in a contaminated environment** (by a large rock covered with dirt for example) with displacement of the nail bed, laceration of the skin, and radiographic evidence of a fracture of the distal phalanx...which required thorough irrigation and debridement, repair of the skin laceration with sutures, and reapproximation of eponychial fold followed by splinting.

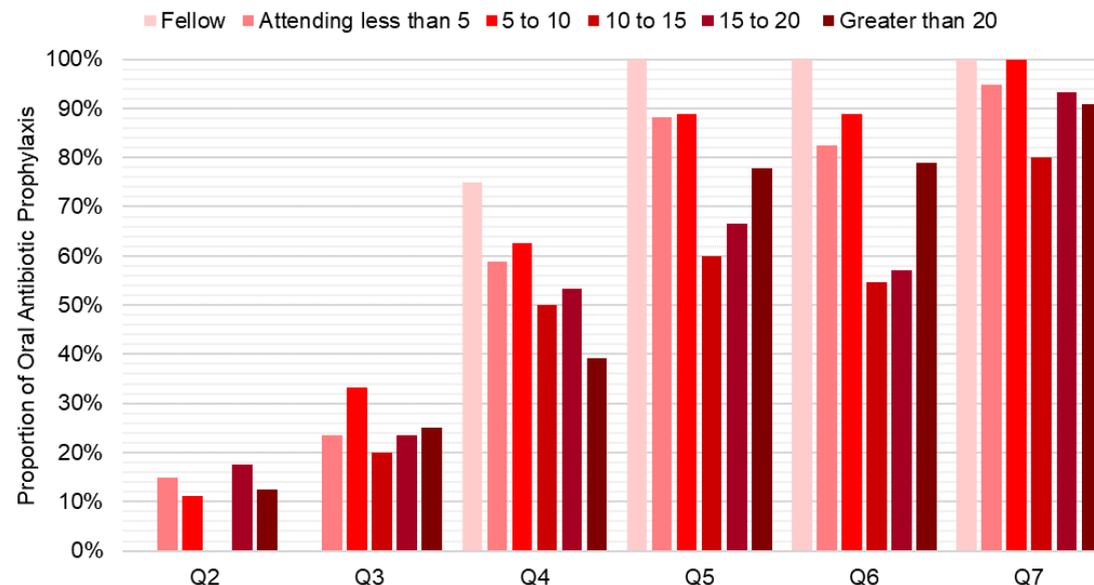
## Results

104 physicians responded to the survey request. Fourteen responses were incomplete and not counted for the purposes of this study. Among complete responses, 88% were submitted by fellowship trained hand



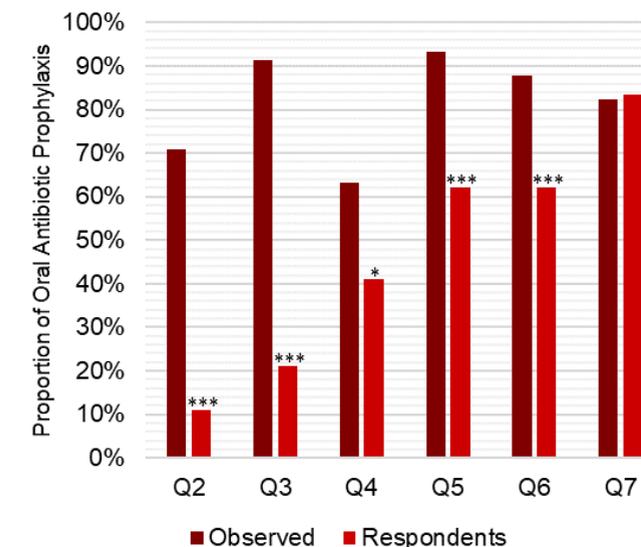
**Figure 1.** Distribution of survey respondents' clinical experience reported as attending physician years (n=90).

Respondents indicated greater rates of oral antibiotic prophylaxis when injury scenarios included radiographic evidence of fracture, occurred in a contaminated setting, or were more severe. Responses did not differ significantly based on number of years in practice (Fig. 2).



**Figure 2.** Comparison of the percentage of responses for oral antibiotic prophylaxis by question based on years of clinical practice as an attending physician.

We then compared survey responses with observed rates of antibiotic prophylaxis obtained from data previously collected as part of a retrospective study at Cincinnati Children's Hospital Medical Center. Retrospective data were filtered for injuries meeting the same clinical characteristics as survey questions. We found that compared to our observed data at CCHMC, survey respondents indicated significantly lower rates of antibiotic prophylaxis for all proposed clinical scenarios, except for the most severe (Fig. 3).



**Figure 3.** Differences in proportion of oral antibiotic prophylaxis between retrospective data sample (observed) and survey respondents (respondents).

## Conclusions

- Practice of utilizing prophylactic antibiotics among fellowship trained hand surgeons on average similar from newly trained to experienced clinicians.
- Predictable increase in proportion recommending antibiotic prophylaxis for more severe or contaminated injuries.
- Large discrepancy exists between practice trends reported by respondents and observed rates of antibiotic prophylaxis at our institution. Potentially attributed to initial evaluation and treatment in the ER by residents vs broad application of standard of care.

## References

- Fetter-Zarkeka A, Joseph M. Hand and fingertip injuries in children. *Pediatric Emergency Care*. 2002;18(5):341-345.
- Lankachandra M, Wells C, Cheng C, Hutchison R. Complications of Distal Phalanx Fractures in Children. *The Journal of Hand Surgery*. 2017;42(7):574.e1-574.e6.

## Acknowledgements

Research funded by University of Cincinnati College of Medicine Child and Adolescent Health Medical Student Scholars Program