Evaluation of the Hand Trauma Transfers at a Level-1 Trauma Center after Joining the ASSH Hand Trauma Center Network

William Delahoussaye, BS; Madeline Gautreaux, BS; Patrick Palines, MD; Kelly Babineaux, MD

LSUHSC; LSUHSC Department of Surgery

Introduction: Hand trauma remains among the most prevalent and expensive injury types within the United States. However, there remains limited access to specialized hand surgical care throughout much of the country, particularly in rural areas. In 2007, the American Society for Surgery of the Hand (ASSH) and the American College of Surgeons (ACS) established the National Hand Trauma Center Network (NHTCN) to improve coordination and regionalization of hand trauma services. In 2019, our institution joined the NHTCN with the aim of expanding access to hand surgery while maximizing efficiency and resource allocation and optimization. The goals of this study are to evaluate how joining the NHTCN affected the volume, demographics, and severity of hand trauma transfers to our institution.

Materials & Methods: Data for this study was collected retrospectively over a six-year period from 2016 to 2021 from our institutional trauma registry. Patients were selected based on the criteria of being transferred to our facility due to hand mono-trauma. Analysis of transfer rates, transfer distance, injury patterns, insurance type, path of care, and hospital charges prior to and after joining the NHTCN in January of 2019 was performed using two-sample t-tests or two-sample proportion tests.

Results: There was a total of 39 hand mono-trauma transfers over three years prior to joining the NHTCN, and 114 over three years after. The average number of hand transfers per year increased by 25 (95% CI: 24.21 to 25.79; $P < 0.0001$), with a significant increase in transfers from both in-state and out-of-state sending facilities. This included an increase in transfers of significant injuries including complete amputations (15 from 4), partial amputations (18 from 13), and open fractures (35 from 11); There were no significant changes in demographic make-up or insurance coverage of hand transfers, although total charges increased from $931,515 to $3,837,625. The average distance traveled by hand transfers increased by 22.58 miles (95% CI: 3.17 to 42.00; $P = 0.0229$) after joining the network. The percentage of closed fractures increased by 14.91% (95% CI: 8.37 to 21.45; $P = 0.0105$) and the percentage of partial amputations decreased by 17.54% (95% CI:-1.30 to -33.78; $P = 0.0186$) after joining the network. The percentage of out-of-state transfers requiring surgery increased significantly (95% CI: 6.20 to 99.36; $P = 0.0404$), whereas there was no change among in-state transfers requiring surgery ($P > 0.05$).

Conclusions: Integration into the NHTCN increased our institution's volume of hand trauma transfers, with patients being transferred from farther sending facilities. These findings suggest that joining the NHTCN increased patient access to specialized hand surgical care at our institution. Although an overall increase in the quantity of severe injuries was observed, there were only modest shifts in the overall composition of transfers. Optimizing and avoiding unnecessary transfers remains a challenging proposition.