

NorthStar Trauma Network Surgical Efficacy Analysis Pre- and Post-Implementation

Akhil Surasani Reddy, Jessica Lu Xu, Indraneel Satish Brahme, Jeffrey D Winter, Rachael L Rivard, Peter A Cole

INTRODUCTION: The NorthStar Trauma Network (NSTN) was designed and implemented in the Twin Cities Metropolitan area in 2018 as an answer to a lack of cohesive orthopaedic trauma care. The network is comprised of seven individual community hospitals from three different health systems. This model provides a framework for population fracture care and sets a standard for American care delivery models in orthopaedic trauma. The purpose of our study is to determine if the development of the North Star Trauma Network (NSTN) impacts efficiency and quality of care for operatively treated orthopedic trauma patients.

METHODS: This retrospective cohort study measured inpatient operative treatment efficiency and quality of care from two NSTN hospitals 3 years pre- and post-trauma program implementation. General category of fractures included hip, femur, tibia, and pelvis/acetabulum fractures. Changes in time to OR, operating time, length of stay, 90-day return to OR, 90-day readmission, and 90-day mortality were recorded.

RESULTS:

Case volume grew an average of 232% from 2018 to 2021 at Methodist (322 vs 1038) and from 2020 to 2023 at Lakeview (277 vs 350). Patients were older (76.74 vs 78.21 years, $p=0.0098$) and had more comorbidities (CCI 5.66 vs 6.21, $p=0.0003$) in the post implementation period. There was no difference in the percentage of females or ASA status (64.6% vs 68.9% $p=0.0621$, 63.9% vs 66.0% $p=0.5053$). Operative time remained unchanged while time from hospital admission to surgery increased (17.81 to 22.43 hours, $p<0.0001$) and length of stay increased (4.42 to 4.92 days, $p<0.0001$) post implementation. Complex procedures, defined for this study as pelvis, acetabulum, and distal femur procedures, increased from 2.3% of total case volume to 6.9%. There was no difference in 90-day complications, readmissions, or mortality.

DISCUSSION AND CONCLUSION: The NorthStar Trauma Network provides a blueprint for other regional trauma networks. Embedding fracture specialists in community hospitals, anchored by a Level 1 hospital, aligns with patterns in other orthopedic subspecialties. This model creates a trauma led, trauma trained team and a culture that optimizes fracture care, hospital efficiency, and capability to treat more complex fracture patterns.