

Appendix B

I. Demographics

Stakeholder	Discipline	Age	Male/Female	Years in Profession	Military/Civilian
001L	Trauma Surgeon	50	Male	15	Both
002J	Trauma Surgeon	48	Male	12	Both
003B	Trauma Physician Assistant/Associate	51	Male	20	Both
004S	Trauma Surgeon	45	Female	5	Both
005D	Trauma Surgeon	49	Male	15	Both
006W	Trauma Surgeon	56	Male	18	Both
007V	Trauma Surgeon	45	Female	6	Both
Mean/Median		49.1/49 IQR 6 Outlier 0	5/2	13/15 IQR 12 Outliers 0	

II. Stakeholder Summary

Five of the seven stakeholders agreed that the four recurring themes from the inductive thematic analysis and discussion of the results from the deductive thematic analysis were essential discussions in the management of NCTH (interviews 001, 003, 004, 005, and 007). Analysis of the collected individual interviews from the stakeholders produced seven recurrent themes about the scoping review results. The recurrent themes are Prehospital management, Expert opinions in the Prehospital environment, Decision making in the Prehospital environment, Transport and Resuscitation in the Prehospital setting, REBOA, Alternative discussion for Research, and Gaps in Research.

Six Stakeholders (001, 002, 004, 005, 006, and 007) commented on REBOA usage in the prehospital and in-hospital settings. The stakeholders noted a steep learning curve with REBOA, and the sustainment of proficiency is complex at best. Additionally, the stakeholders noted that the lack of fundamental training and repetitive usage of REBOA in the in-hospital environment prevents the end user's comprehensive understanding and decision-making. Therefore,

implementing REBOA in a prehospital setting with the need for a comprehensive understanding and decision-making by the prehospital provider would delay transport to a definitive treatment facility and potentially increase morbidity and mortality. Some stakeholders would argue:

“We may not have the right innovation at this time; however, the tourniquet was not favored by in-hospital providers during the Napoleonic error due to prolonged transport time, and the in-hospital providers noted extremities would arrive unsalvageable. But now, in the post-Iraq/Afghanistan error, the person who applied the tourniquet often arrives with the patient, and the in-hospital provider understands why it was applied. But what the hospital provider did not see was the patient who died due to exsanguination in the prehospital environment, another preventable death” (Stakeholder 004)

One stakeholder noted that we may need to reconsider our implementation of REBOA from the prehospital and emergency room settings to placing it in the operating room in a simultaneous posture. The stakeholder discussed two teams working simultaneously, one team performing damage control surgery and one team placing the REBOA (Ordonez et al., 2018, 2020, 2020).

Five Stakeholders (Stakeholder 001, 002, 003, 004, and 005) discussed that transport and resuscitation in the prehospital environment are essential to decreasing mortality in patients with NCTH. All five discussed that rapid transport is essential to survival. All five discussed that performing interventions at the point of injury delays transport and further increases mortality in patients with NCTH. All five discussed hemorrhage control and resuscitation should be performed enroute to facilitate rapid transport to a more resourced facility. One stakeholder discussion discussed the myth of the golden hour; the stakeholder discussed that there is nothing magical about this hour; people die within 30 minutes of their injuries; the stakeholder discussed that we would need to consider whom we are training and sending to the point of injury to ensure

appropriate enroute medical care is provided. Two stakeholders discussed mortality related to transport: the gentrification of the previous knife and gun clubs moving victims farther from previously established Level I trauma centers and prolonged transport contributing to the increased mortality of this population. A second concern discussed was training prehospital providers to do more complex procedures, which only prolongs the prehospital course contributing to increased mortality. Another concern that contributes to decreases mortality is training bystanders to control hemorrhage with programs such as the Stop the Bleed Program. One stakeholder discussed that decision-making is critical, and alternative resuscitation strategies such as hypotensive resuscitation, permissive hypotension, and delaying resuscitation until the patient comes into the trauma center may help improve the survival of patients with NCTH.

Three stakeholders (Stakeholder 002, 004, and 005) discussed that decision-making in the prehospital environment is vital to successful and unsuccessful outcomes. The critical decision should be to transport patients to a definitive care facility with the resources to care for the injured patient. Additionally, the decision-making should incorporate the benefits of alternative enroute resuscitation strategies.

Three stakeholders (001, 003, and 005) discussed expert opinions in the prehospital environment. Recent literature has addressed this concept, with concern that providers spend too long at the point of injury and delay transport to definitive care facilities where more resources are available to ensure the patient's survivability. Some stakeholders have argued that you cannot transport patients faster to a definitive care facility. Providers providing expert opinions at the point of injury may be a feasible option to decrease pre-hospital mortality. Still, the question remains of who these providers are, as there is a need for more qualified physicians.

Two stakeholders (Stakeholders 003 and 006) discussed prehospital providers managing NCTH. The stakeholder discussed that we need to train and empower our prehospital provider to make significant decisions on when to treat at the point of injury, when to transport immediately and when to transport, and how to manage the patient enroute to ensure the best outcomes for the injured patient.

Four stakeholders (Stakeholder 001, 003, 006, and 007) provided alternative discussions not discussed in this scoping review which the author believes are interesting concepts that may need to be explored. The discussions from the stakeholders addressed potential research to answer questions such as why some trauma patients with identical injuries live while some die. Why do some trauma patients with trauma mishaps (wrong blood products provided during resuscitation) in resuscitation survive without morbidity or mortality? Should we look for a genetic component in our patients that might explain these phenomena? Another discussion addresses that door-to-cut time improves survival; however, our current culture delays this process as ground emergency medical providers often need to call aeromedical providers to transport critically ill patients to a definitive care facility rapidly. This delay in transport prolongs the patient's prehospital course, potentially increasing the patient's mortality. A potential path forward may be bringing the operating room to the patient at the point of injury. Another discussion looked at literature from Japan regarding hybrid operating rooms. Bypassing the trauma bay is not a new concept; however, having an operating room where the patient can undergo damage control resuscitation, damage control surgery, and Ct scan evaluation all in the same room might decrease the mortality we see from delayed interventions due to high-risk transport of trauma patients ((JA-HERS), 2019). Lastly, stakeholders noted that we need to be more creative; no innovations produced this far in the management of NCTH have proven to

decrease mortality, like in-hospital damage control surgery. The stakeholders noted we need an intervention/innovation that we can develop, adopt, train, implement, and monitor with an equivalent success rate to decrease mortality in NCTH, a potentially preventable cause of death due to injury.

Four stakeholders (Stakeholders 002, 005, 006, and 007) suggested further gaps in the literature that must be addressed. The first discussion addressed that there needs to be a discussion on prevention in the literature. The second discussion addressed the need for more effectiveness studies on the current innovations for the management of NCTH, as there is no proof that the innovations have decreased mortality. The innovation/intervention developed should be something that in-hospital and prehospital providers can have exposure to repeatedly to develop a comprehensive understanding, allowing them to make better decisions. The stakeholders noted that this is critical to future research. Lastly, some stakeholders noted that we cannot compare the destructive force of wartime trauma to civilian trauma as these are two separate disciplines of care with two distinct patient populations. The stakeholders noted that comparisons of these different patient populations would need to be explored to assess the differences for future trauma research.