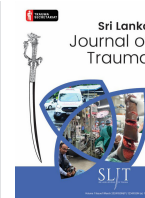




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Guest Editorial

Raising the bar on trauma standards in Sri Lanka

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It is a great honor to write an invited Guest Editorial for the inaugural issue of the Sri Lankan Journal of Trauma. This initiative undertaken through the Sri Lankan National Trauma Secretariat will provide a valuable platform for the entire trauma team to showcase their research and academic efforts. Having recently seen some of the results of trauma patients cared for within the Sri Lankan health care system, it is abundantly clear there is already excellent clinical care being provided to trauma patients at the National Hospital, in collaboration with regional hospitals across Sri Lanka. It is exciting to see the Sri Lankan surgical community take this next step forward toward supporting scholarly efforts and research productivity in surgeons and others interested in elevating the academic and clinical standards of trauma surgery. Establishing trauma as a distinct academic surgical specialty will encourage those currently in training - the next generation of surgeons - to view trauma as a fruitful area of specialty focus; one that is clearly necessary and beneficial to a large number of patients across the country. Perhaps even more importantly, launching a journal synergizes with attempts to develop a comprehensive coordinated national trauma system, which is an essential step toward reducing the burden of injury in any country.

Trauma is the number one killer of children and young adults worldwide, including in the United States where I live and practice. Despite this statistic remaining unchanged for many decades, trauma research remains extremely poorly funded compared to cancer research, for example. The reasons for this disparity are multifactorial: a lack of awareness by the general public of the higher prevalence of injury compared to heart disease and cancer, lack of recognition that research can lead to better treatment and prevention, and trauma surgeons being too busy simply taking care of the many patients arriving at our door to have time to engage in public education and advocacy!

As one example of the discrepancy between the scope of the problem and the investment in solution: the US is the only country in the world where - outside of active war - gunshots are the leading cause of death in children, surpassing even motor vehicle accidents. This statistic is a great cause for embarrassment to myself and my fellow trauma surgeons in the US; yet despite much effort from the surgical community, we have remained unable to convince legislators to take significant action on restricting civilian access to weapons of war, or investing in research on firearm injury prevention. I share this anecdote as a reminder that while we as a trauma surgeon community spend much of our time focusing on improving our surgical practice and clinical outcomes, followed by performance improvement in our

trauma care delivery system, prevention remains the ultimate goal of our profession - essentially, we want to put ourselves out of business. As the Sri Lankan trauma system evolves, it will be important to remember that all aspects: research, education, performance improvement, system development and prevention will need to be included in order to reach the ultimate goal of improving outcomes for all injured patients.

In 2016, the National Academies of Science, Engineering and Medicine (NASEM) in the United States set forth the ambitious goal of Mission Zero: achieving zero preventable trauma deaths [1]. This effort was initiated based on the realization that even in the richest country in the world, where many states (such as Texas, where I live) have had a comprehensive, well-developed and robust trauma system for decades, one-third of seriously injured patients are not taken directly to a high-level trauma center, and 2 out of 5 patients who were alive when emergency services first arrived on scene (a marker of survivability) subsequently died in hospital. NASEM estimated that in 2016, one in five trauma deaths in the US were potentially preventable with optimal care, and thus the number of lives that could potentially be saved warranted a significant investment of effort and energy on the part of experts in the field. The five broad categories they identified as targets for this effort: Emergency medical services/ ambulance system infrastructure and trauma system organization, research and research funding, data and data linkage, work force education and training, and political advocacy as an overarching umbrella. Despite differences in social and cultural background, financial resources, insurance structure and existing trauma system infrastructure, I believe this multipronged effort highlights useful areas of focus for any trauma system in the world seeking to reduce the toll of preventable deaths from injury to a minimum.

As surgeons, we tend to focus on advances in surgical technique and equipment, and certainly there have been notable advances in trauma as well. The use of percutaneous catheters to replace large chest tubes for hemothorax and pneumothorax, [2] along with surgical rib fixation of flail chest and multiple rib fractures has reduced ventilator days, expedited discharge from hospital and reduced short- and long-term pain scores in many patients, including the growing population of elderly patients who sustain rib fractures as a ground-level fall [3]. The use of REBOA remains controversial, however there are undoubtedly cases in which occluding the aorta without resorting to thoracotomy has saved lives and allowed time for definitive surgical hemorrhage control [4]. However, in my career as a trauma surgeon the greatest improvements in

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patient outcome have not come from the purchase of a new, fancy device; rather, they have been the result of painstaking improvements in the system that have required the participation of the entire multi-disciplinary team. One example is the “fly-by” direct-to-OR protocol that I developed at my own trauma center at University Medical Center in Lubbock, Texas in 2016. The FlyBy refers to a system where a patient who has a high chance of requiring immediate surgical bleeding control is taken directly to the operating room from the ambulance bay, essentially bypassing all Emergency Room assessment. This initiative was spurred by a case where I received a 14-year-old boy with a trans-abdominal gunshot wound from a town 2 hours away. Blood transfusion had been started at the outside hospital, and from the description of bullet wounds it was clear there was almost certainly major abdominal injury. That night, we tested the premise by having the ambulance flight crew roll the patient’s stretcher directly to the operating room; after a quick Xray to delineate missile trajectory we started operating, and were able to have a very successful outcome in a patient with significant liver, pancreas and spleen injury. The patient arrived hypotensive and likely on the verge of cardiac arrest; by having the room prepared and blood products already available, we minimized any delay in bleeding control – the number one step in saving a trauma patient’s life. Although this violation of usual procedure certainly triggered initial anxiety and a few complaints from staff, it was clear this unstable patient was better off being taken immediately to the OR than anywhere else. While this is intuitive to all trauma surgeons, literature has been subsequently published validating that time to bleeding control is the primary indicator of survival in trauma patients with major bleeding [4].

Having proven that a direct-to-OR method was feasible, we then met with operating room directors and nurses, anesthesiologists, ER physicians and staff, and created the protocol that would subsequently be deployed smoothly and regularly. During this phase we addressed all the problems that had been noticed in the initial “proof of concept” case: who would enter the patient into the hospital electronic system? How would Xrays be obtained? How would the OR and anesthesiologist be notified? How much lead time notice was required for blood to be already available in the room when the patient rolled in? Who would make the decision to activate the fly-by system, when, and how would this be communicated to the entire team? Once an initial protocol had been developed, we then practiced several times with simulation and drills, to ensure any further kinks were identified and corrected. Since massive bleeding requiring surgery remains a relatively small proportion of all injured patients, it was important that any system developed for these patients be practiced outside of patient care, since there would not be frequent enough use of the protocol to ensure all staff remained familiar. Since that first case, we have treated many patients using this protocol, and it is now a firmly established tool in our toolbox that has allowed us to reduce time to bleeding control and save lives in many patients.

Trauma surgery (including burn surgery) is the surgical specialty that has the closest ties between civilian and military surgeons. In fact, the history of trauma surgery is the history of advancements first recognized on various battlefields around the world, and then extrapolated into civilian practice – massive transfusion, acute respiratory distress syndrome, damage control laparotomy, tourniquet use, and extracorporeal membrane oxygenation are all techniques first deployed in military conflict zones prior to routine incorporation in the care of critically injured civilian patients. Current hot topics include the use of whole blood for massive bleeding rather than components such as packed red blood cells, to prevent the inevitable coagulopathy these patients quickly develop that is often life-threatening. Ironically, the use of whole blood for injured soldiers was commonplace in World War II, before the techniques to fractionate blood had even been invented! Thus, what is old becomes new again, and lessons learned from military surgeons help inform civilian practice, and vice versa. Sri Lanka has already developed robust military-civilian partnerships, stemming from the prolonged experience of facing terrorism and civil

war for over 30 years, and continues to utilize the breadth of expertise available in the military sector to inform trauma care in the civilian setting. This natural synergy is an excellent platform from which to continue to grow collaboration and develop ever more robust trauma systems, protocols, guidelines and practice standards for every level of facility throughout the country.

As the journal develops I look forward to seeing high-quality articles spanning the spectrum of trauma care, from case series of complex patients to reviews of infrastructure and performance improvement processes, to allow Sri Lankan surgeons to educate each other and contribute to the knowledge base of trauma care across the world.

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