# Building an optimal pediatric trauma program

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Today I will discuss the framework for an ideal trauma program in the United States. I believe that the trauma system that we have in the United States is among the best that the world has ever seen. Pediatric trauma is a subset of this trauma system, and some systems are underdeveloped. Given the differences in demographics in most localities, the penetration of pediatric trauma programs is not ubiquitous. Many children receive pediatric trauma care at adult hospitals and trauma centers. The following is an essay adapted from a presentation on hemorrhagic shock consensus conference at the University of Alabama at Birmingham in 2022. I will outline the features that I believe that are important for a viable pediatric trauma program in the United States.

## THE IDEAL TRAUMA PROGRAM

American College of Surgeons Committee on Trauma provides a comprehensive set of criteria and background materials to establish a pediatric trauma program. The committee established a complete set of rules and regulations around various levels of support that should occur in pediatric trauma programs, and this framework is based on quality parameters. Reviewers use this framework to determine not only where systems are excelling but also where systems are not meeting the mark. Based on the advancements that have occurred in trauma care over the last 100 years, this intervention by the American College of Surgeons Committee on Trauma has saved millions of lives. The latest iteration for trauma care is now captured in the gray book, which delineates what the optimal care for the traumatically injured patient is in the United States. This new set of standards will allow trauma providers across the country to deliver the best care for their communities based on a nationally accepted set of guidelines parameters thresholds and standards.

### Rules

On a practical level, I believe that the hallmarks of an outstanding trauma program are based on the trauma medical director and program coordinator to abide by and set comprehensive local rules of care. Leaders for level 1 centers must have approaches that rise above other centers since these centers set the trauma care standards. These leaders implement the scientifically tested hypotheses in traumatically injured patients.

### Resuscitation

The hallmark of a successful pediatric trauma program hinges on their ability to resuscitate severely ill children. Many pediatric trauma centers serve as a regional resource. The community expects that the sickest of the sick should receive care at specialized centers for access to lifesaving therapies. Pediatric trauma centers often plays a critical role within a region given that there are not significant numbers of pediatric trauma centers across the country. Thus, regional systems often designate a wider catchment for these centers. Since resuscitation is critical for the child's survival, it means that the pediatric trauma center leaders need robust outreach to community hospitals and adult trauma centers to ensure that validated pediatric-focused resuscitation techniques are initiated at the earliest possible time and not just when they hit the door of the pediatric trauma center. This collaboration requires that pediatric trauma leaders conduct significant outreach and develop relationships throughout a region.

As pediatric trauma experts, it is incumbent on our experts to discuss the science or opportunities for enhancing pediatric trauma care. Once these interventions are determined and validated, quality teams must generate recommendations that are ultimately implemented through the national guidance programs in the American College of Surgeons Committee on Trauma.

### Relationships

Beyond the rules and regulations in the quality standards set by the College, the most critical element of the trauma center is the relationships inside and outside of the hospital. A trauma center is dependent upon multidisciplinary care that includes surgeons, nurses, technicians, anesthesiologists, emergency care practitioners, prehospital personnel, fire departments, police departments, social workers, and many other categories of providers. The relationships that these folks bring to bear have a substantial and very specific impact on the outcomes of trauma patients. In a pediatric trauma center, the care that the child receives from the field to the hospital and then to rehabilitation is critical because it is not just taking care of the patient, it is also caring for the families that are impacted by the injured child. The relationships that matter most are often defined as a relationship between the trauma medical director and the trauma program coordinator. Communication among this leadership team is tantamount to the success of the program. I would argue that the relationship is broadly applicable to the multidisciplinary team in the trauma center. The trauma medical director and program coordinator must work with a team of professionals

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to establish local guidelines to oversee the quality of care for a level 1 center and work together to produce state of the science research efforts. In addition to this collaboration, the trauma providers are required to perform injury prevention activities throughout the community. Injury prevention programming undoubtedly involves community partners who are vital to the success of the program. Trauma provider–led prevention programming hopefully mitigates injuries in the community. In summary, relationships form the foundation of a viable and vibrant trauma center (Fig. 1).

## National

The importance of trauma centers in saving lives in the United States is clear. Mackenzie et al.[1] documented in 2006 that the presence of trauma centers saves countless lives. The ideal trauma framework involves several national considerations, which include a national mandate to save citizens lives of people involved in trauma; the systematic development of guidelines and regulations; and robust funding support of trauma systems through federal, regional, and local sources.

## Regional

On the regional and local level, service priorities are determined for the delivery of acute care to injured children and the systematic approach to that care for the local region. In addition to the acute care, it is necessary for trauma centers to carry out comprehensive injury prevention programs that address all ages at risk. A key aspect of the acute care program is support regional quality and process improvement programs. Another key function of trauma program leaders is to provide case specific feedback to transferring centers and educate regional providers on pediatric trauma topics. Finally, level 1 trauma centers are mandated to conduct research and disseminate their findings.

## PRACTICAL CONSIDERATIONS

The key to having an ideal trauma program is to have the correct people in the program in the first place. As they say, culture eats strategy for breakfast. Therefore, if you do not have the correct team members on board, it does not matter how good your strategy for building a top-notch trauma program, it will suffer with poor team play. A trauma leader looks for key features in prospective core members on the team. Leaders should value good communication skills, a high degree of empathy, and transparency in teammate thinking. A team built with shared values will overcome challenges in most environments.

I believe that the trauma core leadership team led by the trauma medical director and trauma program coordinator should craft a comprehensive strategy based on three focus areas: acute care, injury prevention, and disaster planning. For each of these program areas, the leadership team should incorporate direct care, education, and research. For instance, the trauma team care givers should incorporate the latest blood products strategies into their resuscitation based on the latest evidence, refined based on new data and disseminated widely to the provider teams. Another example incorporating research into the acute care program is provided by Dr. Burd's trauma program at Children's National Medical Center in Washington, DC. Dr. Burd examines human factor performance in resuscitation.[2–4] His research team examines real-time pediatric trauma responses with engineering principles, concepts, and measurements.

The trauma leadership should use similar tactics for injury prevention and disaster planning. For example, the injury prevention program members at Children's Hospital Los Angeles distributed car seats (care), conducted car seat training (education), and investigated car seat use (research).[5,6] Modern trauma leaders use strategic thinking, creative planning, and rigorous review in all aspects of their trauma programming.

## FUTURE CONSIDERATIONS

The development of young leaders is the foundation to the longevity and growth of pediatric trauma programs. Trauma leaders should seek and develop leaders in the medical, nursing, and prehospital fields. These leaders should be encouraged to pursue projects in education and research for the field to grow at a vibrant pace. Organizations such as the Future Leadership Program sponsored by the Committee on Trauma of the American College

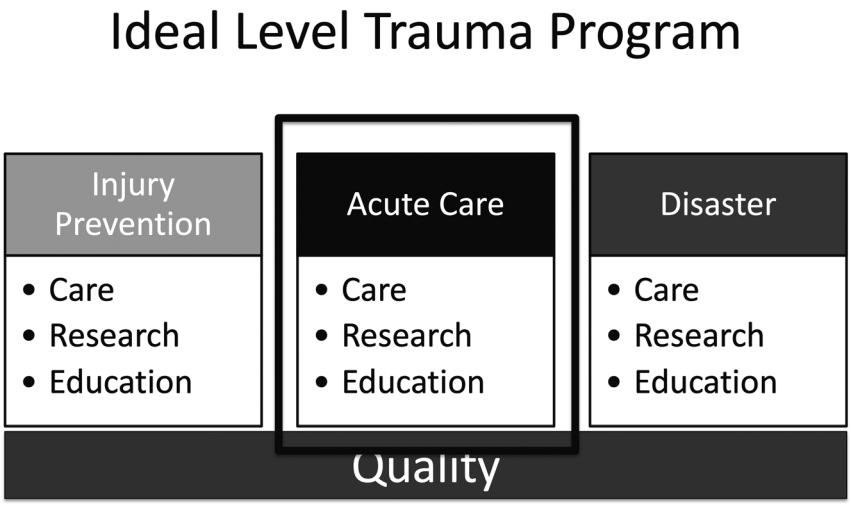


**Figure 1.** An ideal trauma program includes acute care services, injury prevention, and disaster programming. Each area includes three functions: care or service, research, and education programming.

of Surgeons or the annual programming in the Pediatric Trauma Society are critical programming for developing a young cadre of trauma focused professionals. Organizational leaders should develop mentoring programs so that young interested leaders can interact with seasoned professionals in the pediatric trauma.

Scientific discovery is the cornerstone in the advancement of a strong pediatric trauma field. Therefore, opportunities should continue to develop in the trauma community for federal, regional, and local funding for trauma research and programming. Community and professional networks are also necessary to support the continued progress of pediatric trauma. Networks are the best framework for generating new ideas, testing important hypothesis, and disseminating evidence-based guidance to the field.

## CONCLUSION

Talented people who come together with a shared vision of saving lives will formulate the ideal pediatric trauma program through effective care, critical research, and the promulgation of evidence-based guidance. Effective leadership and emerging leaders in the field are the key to the success in the pediatric trauma field. Resources are needed to develop the pediatric trauma field. Funders should focus on supporting pediatric trauma focused research and evidence-based programming.

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### DISCLOSURE

The authors declare no conflicts of interest.

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