GUEST EDITOR'S PREFACE

Pediatric Trauma: A Roadmap for Evidence-Based, Patient-Centered Coordination and Care

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For children younger than 14 years, there has been a dramatic and steady decline over the past 2 decades in injury-related mortality from 9427 deaths in 1986 (age-adjusted rate of 18.04/100 000) to 6530 in 2006 (age-adjusted rate of 10.59/100 000).[1] Many factors contribute to this improvement including injury prevention strategies as well as treatment and aftercare of trauma patients. Although tremendous strides have been made, injury remains a leading cause of morbidity and mortality in the United States and is especially concerning within the pediatric population where trauma can rob years of happiness and productivity.

This issue of *Clinical Pediatric Emergency Medicine* focuses on the complete spectrum of pediatric trauma care, beginning with the initial "golden hour," emergency medical services care at the scene, through critical care management. It incorporates perspectives from pediatric emergency medicine physicians, emergency medical services providers, and critical care physicians. It will address present state of care, improvement strategies, and potential areas that can help us not only decrease mortality but do so in a cost-effective manner cognizant of facility and manpower resource limitations. Unlike many previous anthologies on the subject, it will also take into perspective a more patient-centered approach to what can be done with new and emerging technologies, taking into account long-term implications when considering what interventions are most beneficial to the patient in the immediate care situation. It will look at questions such as the risk vs benefits of computed tomographic scanning in light of radiation exposure. This issue will address topics such as coordination of care between subspecialties, transitions of care, and care of pediatric trauma patients in adult-based centers. It will, however, go beyond the traditional bounds and will touch on the more holistic approach to care that can and should be part of our broader perspective on pediatric trauma management. This will include sections on pain control as well as posttraumatic stress disorder recognition and prevention.

Trauma care has emerged from its infancy in the latter part of the 21st century as a focus of modern medicine. Military experiences have helped push the envelope of trauma care and continues to help us mold our perspectives, knowledge, and treatment of trauma.[2,3] Trauma centers have been proven to have a positive impact on patient management, ultimately leading to decreased mortality.[4] Pediatric trauma care has, however, as is the case in most areas of pediatric medicine, taken a backseat to much of the initial focus that has been adult patient based. It was not until the development of the

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Emergency Medical Services for Children program in 1984 and the Institute of Medicine report on Emergency Medical Services for Children that pediatric trauma care began to separate itself out as a functionally distinct discipline.[5,6]

Evidence has mounted over the years that regionalized centers with pediatric equipment, personnel, and expertise have contributed to the overall improvement in pediatric trauma management.[7-9] In addition, coordinated aftercare in centers with pediatric surgeons and pediatric critical care physicians has improved outcomes. Differences in operative vs supportive treatment of the pediatric patient as compared with the adult trauma patient, especially for blunt abdominal trauma, and comfort levels and expertise with the pediatric patient may contribute to these effects.[10] Consensus opinion and present standards for field triage of pediatric trauma patients support the direction of those children meeting trauma criteria to a pediatric capable trauma center.[11]

Many communities do not have the volume of patients or resources required to support designated pediatric trauma centers. Facilities within communities that do have this volume are often stretched beyond their functional capacity given the prevalence of emergency department overcrowding and the use of emergency departments as the safety net for medical care for many underserved populations.[12,13] These factors, along with the shear cost of keeping trauma centers available 24/7 in communities that may not have the required resources, make it even more important to develop trauma centers within well-coordinated regional systems to best transport, stabilize, and definitively care for critically injured children.[11,14] However, today, fewer than 200 pediatric trauma centers exist in the United States; and more than 28% of children younger than 15 years are more than 1 hour from such centers by ground or by air transport. This disparity is even greater in rural areas, where 77% of children are more than 1 hour from such centers.[15] Given the critical importance of stabilization within the "golden opportunity" for care, we have a long way to go in coordinating such care and establishing centers capable of providing optimal management to this vulnerable population. This points to a need to expand access to pediatric trauma care for greater numbers of children and to continue to grow and enhance the networks available. Those centers that do exist need to fully coordinate care over large catchment areas with the necessary support systems and transfer protocols to best serve the children throughout their regions. These items will be among those addressed in this series of articles and are some of the most challenging issues faced as we seek to continue to expand and enhance pediatric trauma networks.

Even when we are fortunate enough to have an abundance of resources or tertiary care pediatric facilities in a region, we must also determine if we are using our resources appropriately and, in doing so, delivering evidence-based, highest-quality care. Technology simply for technology's sake may not always lead to the best outcomes. We must therefore critically evaluate the sensitivities and specificities of such "advancements" as well as balance the long-term effects and costs (financial and even adverse medical) that can come from their usage. Examples such as focused assessment sonography in trauma examinations and their use in the pediatric population, screening laboratories, and radiologic studies must all be critically evaluated.[16-20] The present state of knowledge and risks vs benefits of each will be addressed.

Lastly, patient- and family-centered care needs to be at the forefront of what distinguishes the management of pediatric trauma.[21] Having the proper equipment and personnel for the basic trauma needs of children of all ages remains essential. However, recognition of the need to treat both patients and their families can help bring a more holistic approach to meeting the needs of our most vulnerable patients and their families. Consideration of the entire child and his or her family, and not just the injury (eg, "the fracture in room one"), remains a crucial part of the challenge set forth in pediatric trauma care. Health care providers tend to underrecognize, undertreat, and fail to prevent pain and anxiety in children, and limit the impact of these stressors related to trauma.[21] This issue will therefore also address pain management of the pediatric trauma patient, posttraumatic stress disorder recognition, and prevention strategies. Although we still have a long way to go to optimize the care of injured children, this series should act as a roadmap for the broad range of care providers treating pediatric trauma patients.

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