



Pediatric Anesthesiologists Are the “Right Stuff” for Pediatric Trauma Patients

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We have all heard the phrase, “pediatric patients are just small adults... just do the same thing you would for an adult at half the dose.” Despite this old adage, it has long been known that mortality rates in the pediatric population decreased when children were not treated as small adults.¹ Pediatric patients have unique physiology and anatomy, require different equipment, and differ with regard to pre-, intra-, and postoperative concerns. In his presidential address to the American Pediatric Surgical Association in 2014, Dr. Keith Oldham focused a great deal on this topic. His goal was to define the optimal surgical environment for children. Because injury is the leading cause of death in children in the United States, and injury accounts for 160 hospital admissions and 2000 emergency department visits for every patient death,² pediatric trauma should obviously be included in the discussion. He proposed that all children in need of surgical care in North America receive that care in an environment of specialized equipment, personnel, and experience to best match their individual needs.

Dr. Oldham does not pretend to take credit for identifying this issue; instead, he gave credit to a similar statement made in 1941 by Drs. Ladd and Gross, the fathers of pediatric surgery. Later, in 2001, then-APSA President Dr. David Tapper furthered this objective with his “The Achievement of Audacious Goals,”¹ where he asserted that certain surgical diagnoses require treatment in a pediatric facility, defined ages where children should be operated on only by specialty certified pediatric surgeons and anesthetized only by pediatric anesthesiologists, and demanded that health care for children be considered a right and be appropriately funded. As this movement has continued to gain steam, an ad hoc group known as the Task Force for Children’s Surgical Care was formed from leaders of various pediatric surgical specialties and other disciplines, namely various pediatric medical specialties and pediatric anesthesiology. This group worked to stratify infants and children by clinical circumstances to define the best clinical environment required for their optimal care. According to this document, children’s surgical centers were categorized as basic, advanced, or comprehensive based on their available resources (see **Table 1**). Key to this idea is a team of personnel that have specialized training in pediatric specialties and a sufficient caseload for maintenance of pediatric-specific skills.

Surgical Center Type	Patient Age	ASA Status	Specialists Available	Procedures Performed
Basic	>1 year	1, 2	Anesthesiologists with pediatric experience only	Most common, low risk
Advanced	Any	1, 2, 3	Pediatric anesthesiology, neonatology, minimal surgical specialties	Common illnesses for most pediatric surgical specialists, minimal subspecialty coordination needed
Comprehensive	Any	All	Multiple medical and surgical specialties, pediatric anesthesiology	Major illnesses, complex medical problems or those likely to require significant coordination of multiple specialties

Table 1: Proposed Classifications of Pediatric Surgical Centers^τ

In the inaugural addresses by Tapper and Oldham, as well as the final recommendations from the task force, pediatric anesthesia care is addressed at some length. The task force defines a pediatric anesthesiologist as “an individual certified in Anesthesiology by the American Board of Anesthesiology, in addition to being certified or eligible for certification in Pediatric Anesthesiology.”³ The task force believes basic centers require only a general anesthesiologist with pediatric expertise. The advanced and comprehensive centers require the availability of an anesthesiologist with additional certification in pediatric anesthesia as a consultant within 60 minutes of request or two pediatric anesthesiologists on staff with one available to respond within 60 minutes of request 24 hours a day, seven days a week, respectively. They go on to delineate the elevated risk inherent to anesthesia in children over the general adult population, with a three-fold higher risk of anesthesia-related cardiac arrest in children under 12 years, a five-fold higher risk in infants under one year, and an striking ten-fold higher risk in the neonatal period. Additionally, there is a reduction in the occurrence of adverse respiratory events in the perioperative period when pediatric anesthesiologists assume care of these young patients. The American Society of Anesthesiologists released a statement,⁴ supporting the involvement of physician anesthesiologists in the optimal care of children and recognizing the importance of the newly developed subspecialty certification in pediatric anesthesiology, but it took issue with the recommendation of only pediatric subspecialty certified anesthesiologists caring for children under one year of age, as routine care of healthy infants is part of core American Board of Anesthesiology training for generalist anesthesiologists.

Unfortunately, the resources and personnel described in the work put forward by the task force are not ubiquitous. Traumatic injuries will often require stabilizing treatment on the local level due to either medical necessity or geographic infeasibility, later evaluating the patient for transfer to a pediatric trauma center for definitive care. Goldstein et al.⁵ defined this as secondary triage and analyzed data from the National Trauma Data Bank (NTDB) from patients 15 years or younger that were transferred to Level 1 pediatric trauma centers, looking for secondary over-triage, defined as an injury severity score of less than nine, no need for surgical procedures, no critical care unit admission, and a length of stay less than 24 hours. This risk for secondary over-triage is a natural corollary to the previously described goal of the Task Force for Children’s Surgical Care. The criteria for secondary over-triage was met in 22.4% of the patients in Goldstein’s review of the NTDB, with more than one-third of these patients not even meeting criteria for hospital observation. This presents a significant burden on a stressed system, as well as an inconvenience for patients and families and a significant unnecessary cost. It is widely accepted that some rate of secondary over-triage will occur to avoid suboptimal outcomes, but the creation of guidelines to more effectively provide high-quality, definitive care with the most efficient use of resources is very much needed, especially as triage to pediatric centers becomes more prevalent and commonplace.

In conclusion, pediatric patients are significantly different from their fully-grown counterparts. This difference demands specialized care in most circumstances, which has become the focus of the American

Pediatric Surgical Association and many affiliated pediatric specialties and the joint Task Force for Children's Surgical Care. This group has very carefully explained why pediatric anesthesiologists play an important role in the optimal surgical care of children, prompting many organizations to analyze their current resources to see if they have "the right stuff."

References

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