Considerations for the Utilization of Pediatric and Neonatal Specialty Teams

Position Statement of the Association of Air Medical Services (AAMS)

Approved by the AAMS Board of Directors

[Date]

BACKGROUND

Pediatric and neonatal specialty teams provide expert care to medically fragile, ill, and injured patients. Despite the prevalence of these types of teams, there is not a national standard defining staffing and team composition, utilization, associated medical direction, or mission profile of these types of teams. In addition, triage and mutual aid systems between “standard” and pediatric/neonatal specialty teams do not exist in many systems. Thus, this position paper defines pediatric/neonatal specialty teams, provides considerations for staffing and medical direction, emphasizes the importance of triage and mutual aid in these transport systems, and describes patient populations that may most benefit from specialty team care during medical transport.

A. Purpose

The medical transport community supports the safe and appropriate use of pediatric and neonatal specialty teams. The standards of AAMS strive to promote excellence and safety in patient care to maximize outcomes. The purpose of this position paper includes the following:

1. To establish guidelines for the triage of neonatal and pediatric patients in order to determine the most appropriate use of finite neonatal/pediatric specialty resources.

2. To establish guidelines for the triage of neonatal and pediatric patients in order to determine the most appropriate mode of transport in order to maximize outcomes.

3. To promote active collaboration and coordination between neonatal/pediatric specialty care team and “standard” ground ambulance and air transport teams in order to meet patient care needs.

4. To establish guidelines for and provide examples of patient types and patient care needs that may be best served by neonatal/pediatric specialty care teams.

5. To define minimum capabilities, staff education and training, and equipment for neonatal/pediatric specialty care teams.

B. Definition of a specialty team

1. Definition of a specialty team

For the purpose of this paper, the term “Specialty Team” specifically refers to healthcare practitioners with particular experience and training in the care of the neonatal and/or pediatric patient. Specifically, this professional experience and training includes:

a) Baseline professional work experience in the care of the critically ill, injured, and medically fragile neonatal/pediatric patient

b) Experience providing patient care in the transport environment where the primary mission is:

1) Providing emergency and/or critical care to the pediatric patient, and/or,

2) Providing emergency and/or critical care to the neonatal patient

2. Operational Aspects of a specialty team

Operational aspects of specialty teams may vary, specifically:

a) Team composition (level of training/licensure of providers)

b) Level of team dedication (dedicated transport team or team pulled from ICU environment)
c) Scope of service and definition of pediatric patients (age or weight ranges, logistics of presentation for care, actual or potential diagnosis, and/or indications for specialized care)

C. Defining Characteristics of Specialty Teams

1. Staffing

Specialty team compositions vary nationwide but generally consist of at least two team members; at least one of which is a registered nurse with extensive critical care experience in neonatal and/or pediatric patient populations. Additional team members may include a registered nurse, respiratory therapist, paramedic, or nurse practitioner, physician’s assistant, or physician, all of whom possess training, experience, and expertise in neonatal/pediatric critical care. Each of these disciplines brings with them certain skill-sets which may enhance patient outcomes. For example, the respiratory therapist may contribute additional airway and ventilation skills. The paramedic may provide pre-hospital, scene management, and initial stabilization experience. Team members undergo a rigorous initial orientation process and ongoing skills development in clinical, operational, and safety aspects of medical transport commensurate with national medical transport standards.

2. Medical control and medical direction

Although neonatal/pediatric staff members are the most visible aspect of a specialty team, the benefit of specialized medical direction is equally important. Involved medical director(s) who actively practice in neonatal/pediatric centers can perform staff education and case reviews, ensure current evidence-based practice, and provide on-and off-line specialty care medical direction. In addition, medical directors and/or medical control physicians often apply their specialized knowledge and training to provide guidance to referring physicians to optimize care prior to transport team arrival.

The AAP recommends a Medical Director to oversee the operations of the transport team; however roles and responsibilities vary from program to program. Specific roles for the medical director include development of clinical protocols, training and providing medical support and direction. The medical director should have critical care experience in both neonates and/or pediatrics as appropriate for the scope of practice of the team as well as training in critical care transport. Ultimately, the medical director is responsible for the care provided by the transport team and should be involved with the hiring, education and training of the crew members. The medical director provides guidance to the referring physicians prior to the transport team arriving as well as to the transport team during the transport.

Determining mode of transport, crew configuration, and appropriate equipment are responsibilities of the medical director.1

3. Level of team dedication

The Commission on Accreditation of Medical Transport Systems (CAMTS) specifically recognizes two categories of Specialty Transport Teams. The first of these involves a team who is “specifically trained for air and/or ground transport and is not accompanied” by additional transport team members. Often referred to as “Dedicated” teams, their primary mission is to serve specific patient populations (neonatal and/or pediatric).2 These Specialty Teams may be independent or may be part of a larger medical transport service.

The second category recognized by CAMTS is a team comprised of “specialty personnel who are added to the regularly scheduled transport team”2. These members are added due to their particular expertise with a given patient population. Generally, these members receive a certain, minimum amount of training to help them better function in the transport environment.

4. Mission profile and scope of service

The mission profiles and scope of service statements vary greatly among specialty teams and are difficult to generalize. Depending on geographic region and associated population density, transport vehicle and other resource availability, supporting system(s) (hospital versus free-standing transport programs) and local transport resources, the types and ages of patients transported by a specialty team vary dramatically. A question answered differently across the nation is “What is a pediatric patient?” Ultimately, the answer to this question defines both the neonatal and the adult patient.

For example, at what point does the newborn cease from being a neonatal patient and become a pediatric patient? Is it at the age of thirty days? Is it a two-day old infant who has returned the emergency department? Or is it the four-month old that has yet to be discharged from the hospital? Similarly, at what
point does a young person cease being a pediatric patient and become an adult patient? Twelve? Eighteen? Signs of puberty? Specialty teams across the country have varied answers to these questions.

5. Transport vehicle availability

Specialty teams may utilize dedicated vehicles or have contractual arrangements to ensure vehicles are available within a specified time period. Many specialty teams have access to more than one mode of transport. Guidelines and protocols are utilized to assure appropriate resources are utilized based on time, distance and patient acuity.

D. Background – Specialty Team Need and Use

A majority of children in the United States today access their initial medical care at local community hospitals. These hospitals are often ill-equipped to handle a critically ill child, lacking the physical resources and/or the specialized expertise to provide pediatric critical care. Often the child is triaged, treated to the best of the facilities capabilities, and transferred to a regional pediatric tertiary care center for ongoing diagnostic and/or critical care. Despite advances in pediatric emergency care in community hospitals, inter-facility transport remains a significant challenge which is complicated by a lack of a definitive diagnosis, an increased severity of illness, and the inherent risks found in the transport environment. Furthermore, children who require transfer to tertiary care may require more major interventions (i.e. endotracheal intubation, inotropic support), careful monitoring (invasive and non-invasive), and serial assessments which warrants a crew with an in-depth knowledge of pediatric disease pathology and care.

EMS providers may have limited exposure to critically ill children, medically fragile children, or those children requiring specialized care. Statistically, pediatric patients represent only 13% of all EMS transports. Thus, pediatric critical care transport teams were developed to rapidly deliver specialized intensive care to critically ill children at referring facilities. The use of specialized pediatric critical care transport teams has been associated with a reduction in transport morbidity and mortality. The incidence of significant physiologic deterioration during inter-facility transport in pediatric patients ranges between 3.4% and 5.6%. Critical events occur in as many as 31% of air ambulance transports in some pediatric patients. Common preventable problems in critically ill children, such as right mainstem intubation, esophageal intubation, and obstructed endotracheal tubes, and inappropriate size endotracheal tubes have been associated with a significant incidence of physiologic deterioration during transport when transported by referring hospital providers. Thus, it is desirable to utilize clinicians with pediatric expertise and experience when caring for these critically ill patients in the inter-facility environment.

Specialized neonatal/pediatric critical care transport teams can bring expertise in the assessment and stabilization of critically ill pediatric patients. Pediatric critical care transport providers have the unique opportunity to extend early goal-directed therapy into the pre-tertiary care setting. The implementation of early goal-directed therapy has been associated with improved outcomes in some populations.

When considering options for inter-facility transport, immediacy of need for transfer, rate of transfer, mode of transport, and skill level of providers are typically considered. Speed of transfer must be balanced with the need for pre-transport stabilizing care. In recent years, misapplication of the “golden hour” concept may have created an exaggerated emphasis on expeditious transfer to tertiary care facilities. Early goal directed therapeutic interventions may be delayed in these cases, thus adversely affecting outcomes.

In an ideal system, pediatric specialty trained transport providers would always be available to transport pediatric patients in whom rapid stabilization and transfer to tertiary care may affect outcomes. However, these providers are a finite resource that must be allocated to those patients whom demonstrate the greatest need for pediatric specialty services. Resources for rapid transfer of patients such as air medical aircraft are also limited in number, particularly when compared to ground ambulance resources. Air medical resources must be utilized for those patients with time-dependent disease processes or those who are critically ill and/or unstable.

Therefore, guidelines for the appropriate use of any transport team are necessary in order to meet patient care needs. Ideally, this entails collaboration among “standard” ground ambulance systems, air medical programs, and pediatric/neonatal specialty teams in order to safely and effectively provide for the
needs of the patient. Appropriate triage and collaborative efforts may be most critical in the care of some
types of pediatric patients as well as in patients with time-dependent disease processes.

E. Appropriate Utilization of Specialty Teams

One of the most difficult things to define is which patients benefit most from a Specialty
Transport Team. The term “pediatric” is used indiscriminately; it is a difficult category to define. If a
children’s hospital has a dedicated transport team, with all modes of transport available for use, the
specialty team is able to transport any patient by any mode the physician determines appropriate. If the
specialty team is part of a transport program that has multiple teams, guidelines need to be written to
determine which team should transport which patients.

The Council on Child and Adolescent Health has published a statement that addresses the various
criteria that they consider to be imperative to making this determination. Their statement defines the
purview of pediatrics to include the physical and psychosocial growth, development, and health of the
individual. They state that it begins with the fetus and continues through 21 years of age. They further
state that pediatrics ends at the time when growth and developmental processes are complete. The
council addresses the health care needs of children with special health care needs as potentially expanding

Determining a specific age of patient for the specialty team to care for is also difficult as well.
Identifying the needs of the pediatric patient is what should determine the need for a specialty team.
Patients with disorders and diseases of childhood, such as congenital heart disease, may benefit from the
expertise of a specialized team into adulthood. Diagnosis and equipment needs should determine the
medical crew configuration.

Neonatal/Pediatric specialty teams should be considered for inter-facility transport of patients in
critical condition, at high-risk for rapid deterioration, with pediatric-specific disease processes, or who
require specialized equipment, interventions, or medications during inter-facility transport.

1. Critical Condition

2. Premature birth

3. Neonatal surgical emergencies

4. Neonatal medical emergencies

5. Septic shock

6. ARDS

7. Status asthmaticus with/without intubation

8. High-frequency ventilation

9. Severe respiratory distress/impending respiratory failure

10. Pulmonary hypertension

11. Multi-system organ failure

12. Airway masses

13. Need for ECMO

14. Diabetic Keto-acidosis

15. Refractory seizures

16. High-risk for rapid deterioration
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17. Declining neurologic status
18. Declining respiratory status
19. Impending airway failure
20. Pediatric-specific diseases
21. Congenital heart disease
22. Pulmonary hypertension
23. Genetic disorders with multi-system involvement
24. Metabolic disorders
25. Specialized equipment, interventions, or medications
26. Isolette
27. Nitric oxide
28. Prostaglandin
29. Mechanical ventilators with capability for tidal volumes or pressures appropriate for infants

F. Mutual Aid

The Mutual Aid System is designed to ensure that adequate resources, facilities, and other support are provided to an area whenever their own resources are inadequate to cope with a given situation(s) or request. Specialty teams frequently have an exclusive relationship with a pediatric institution, cover large geographic regions without duplicate services, and are limited in number; therefore, mutual aid agreements may be difficult to develop. However, local/interstate and intrastate agreements could be considered.

The Mutual Aid agreement for local or interstate transports would include an agreement between pediatric/neonatal specialty teams within a state to provide back-up for transport when specialty team resources are not available at the location of the initial contact. The Mutual Aid agreement for intrastate would be an agreement between the local and/or federal government and pediatric/neonatal specialty teams to provide transport during times of disaster. This aid should address minor incidents to large-scale disasters. Some emergencies will be preceded by a warning period, providing sufficient time to warn the public and implement measures designed to reduce loss of life. Other emergencies occur with little or no advance warning, thus requiring immediate activation and deployment of resources. All programs should be prepared to promptly and effectively respond to any emergency, taking all appropriate actions, including requesting and providing mutual aid. The specialty team community must step out of their comfort area; whether geographically or procedurally to provide care to patients in this time of need.

Mutual Aid agreements are not common for specialty teams; however, an increased focus on disaster planning for acts of terrorism as well as natural disasters such as Hurricane Katrina have illuminated the need for such agreements. Providing back up to areas whose resources are limited is vital for critically ill neonatal and pediatric patients.

POSITION STATEMENT

G. Position Statement

For neonatal and pediatric patient requiring inter-facility critical care transport, specialty teams should be used when the advantages of using such resources contributes to patient care outcomes.
AAMS supports that the transportation of patients by a neonatal/pediatric specialty team include the following considerations:

1. The patient has specific needs that may be best addressed by specialty care providers who are trained in pediatric-specific disease processes, who are trained in high risk and invasive procedures on neonatal/pediatric patients, or who have training and access to specific equipment and medications. Examples may include patients with congenital heart disease or metabolic disorders, patients who require invasive line placement or management of a critical pediatric airway, or patients who require an isolette, high-frequency ventilation, or nitric oxide during inter-facility transport.

2. Both neonatal/pediatric specialty teams and “standard”/adult teams should have an active system to triage patients in order to determine the need for specialty team versus standard team transport. This triage decision process should occur with consideration to the potential impact of specialty teams on patient outcomes. Active participation in the specialty team triage process by a physician with pediatric critical care expertise is recommended.

3. Specialty teams should work collaboratively with other “standard” ground critical ambulance and air medical programs in order to ensure that patient care needs are met for all. This collaboration is particularly important for patients with time-dependent disease processes requiring emergent transfer to tertiary care when pediatric specialty-trained providers are not available and for whom a “standard” team is able to complete the transport more expeditiously due to logistical factors. An example may include a pediatric patient with a rapidly expanding epidural hematoma in whom emergent neurosurgical intervention is required.

4. Specialty teams should maintain an active triage system to aid in the determination of appropriate and optimal use of limited neonatal/pediatric critical care specialty resources. Such triage systems may be comprised of standard triage tools or physician/nurse triage in order to determine specialty care needs for inter-facility transport. Transport triage systems should be designed to balance patient-specific specialty care needs with rate of transport, acknowledging that outcomes may be enhanced through the use of a specialty team despite the potential additional time required for stabilization and early goal-directed therapy prior to transport.

5. Specialty teams are finite resources. Systems should be considered to address the needs of patients requiring specialty care in the absence of specialty resources in that region or when a further delay in transport is potentially detrimental to patient outcome. Concepts such as “hybriding” a team (placing someone with neo/ped expertise on board with regular crew member or crew) should be considered as an alternative when all other specialty resources have been exhausted.


