Please help me welcome the two newest members of the Section on Transport Medicine Executive Committee: Caraciolo J. Fernandes, MD, FAAP, representing neonatology, and Howard S. Heiman, MD, FAAP, representing neonatology. And the Section leadership would like to take this opportunity to thank Dr Patricia Ramsay for all of her work on the Executive Committee for the past 3 years.

We congratulate the Section Award winners, James Cappon, MD, and Crystal Joyce, DO. Read their complete abstracts on p. 11.

Do you have questions or suggestions about the work of the Section? Would you like to become involved? Please let me know.

**AAP Response to Proposed Changes to the ACGME Pediatric Program Requirements**

In August 2011 the Accreditation Council for Graduate Medical Education (ACGME) solicited comments regarding proposed changes to the pediatric residency program requirements. The Division of Workforce and Medical Education Policy solicited input regarding these proposed changes from all AAP committees, councils, and sections. Overall, the majority of the comments were specific in nature to each individual group. There were, however, two themes that transcended these individualized recommendations: (1) a concern that many programs are not large enough to allow residents to develop recommended procedural competencies, and (2) anxiety that the new requirements will not provide trainees with a solid foundation in general pediatrics. For more information, please visit the Academy's workforce web site at www.aap.org/workforce.

**Information from National Headquarters**

Contact Carolyn Mensching at cmensching@aap.org with any questions.

**Get Involved in the AAP**

A collaborative effort has been launched to encourage AAP members to become more involved in the work of all levels of the AAP. We recognize that not all members will be able to contribute in the same way, but every member has something to contribute! We welcome all contributions and commitment levels to move the AAP mission forward. Send an email to getinvolved@aap.org with your interests and we will help you to make the right connection.

Be inspired by viewing the video that debuted at the AAP National Conference & Exhibition! You may share this link broadly to encourage others to get involved as well!

http://youtu.be/yz9utlafE_c

**Lead @ AAP website**

Visit http://www.aap.org/moc/leader. "It is amazing. Clearly the best compendium of leadership information for working within an organization that I have seen. The tabs of Topics across the top are particularly well conceptualized. Having access to this web site is a clear benefit of being an AAP leader. One quickly can see the broad picture."

— John Chamberlain, Chair-Elect, Section Forum Management Committee

We are excited to announce the American Academy of Pediatrics Lead @ AAP Website! Lead@AAP is a comprehensive resource, not only for current AAP leaders but also future leaders and interested members, to learn more about the AAP and how committees, councils, and sections function. We encourage you to take a look and submit a question or comment — we’d love to hear from you!
Executive Committee
2011-2012

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Chairperson

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Manager

Section on Transport Medicine Election Coming Soon!!
Look for additional information via the SOTM LISTSERV.
Questions? Interested in being a nominee?
Contact the 2011 Section Nominations Committee for details:
Sherrie Hauft, MD, FAAP hauft@kids.wustl.edu
Michael Bigham, MD, FAAP mbigham@chmca.org

2011 Section on Transport Medicine Section Awards
Congratulations to the 2011 winners!!

C ROBERT CHAMBLISS MD BEST PAPER AWARD -- Recognizes the best abstract or poster presentation given during the SOTM education program by a non-student or non-resident transport professional.

Pilot Study of the Pediatrics Early Warning System (PEWS) During Pediatric Interfacility Intermediate-Level (ACLS) Transports
James Cappon, MD, presenter, was awarded a $500 prize.
Purpose: Our freestanding children's hospital implemented PEWS on non-ICU inpatients two years ago. PEWS is a physiology-based nurse assessment tool that serially scores and trends respiratory, cardiovascular and neurobehavioral status. Additional high-risk markers can be assigned (Table). Internal and external data demonstrate that worsening PEWS scores are associated with imminent patient deterioration, need for ICU care and resuscitation events. We postulated that through Emergency Transport Service Team (ETS) application of our inpatient PEWS to ACLS patients at the time of ETS field evaluation, we could reduce the number of transported Medical-Surgical patients who experience early deterioration after admission. Moreover, we aimed to eliminate indeterminate-status transport patients requiring a brief PICU triage evaluation upon transport completion (“fly-bys”).

BEST-IN-TRAINING PAPER -- Recognizes the best abstract or poster presentation given during the SOTM education program by a student, resident, or post-graduate fellow.

Pediatric Critical Care Transport In the Primary Care Setting: Is This Where We Should Be?
Crystal Joyce, DO, presenter, was awarded a $250 prize.
Purpose: Approximately 200,000 infants and children in the United States are transported each year from one hospital to another for specialty neonatal or pediatric care unavailable at their community hospitals. Interfacility transports are commonly performed by specialty pediatric critical care transport (SPCCT) teams. Ill children may present to non-hospital settings such as primary care offices or urgent cares and require emergency care and transport. Some non-hospital settings are ill-equipped to manage an unstable child, and the care providers must decide the appropriate means of transport: EMS or SPCCT. Herein, we sought to describe a single-center's experience with specialized critical care transport from these non-hospital settings.

The complete abstracts are available on p. 11.

Writers Wanted!
Share your perspectives and experiences in transport medicine: changes in AAP practice guidelines; CAMTS certification; NCC Neo/Pediatric transport credentialing; transport team composition; simulation transport team training; emergency preparation; transport educational opportunities; transport safety; transport equipment; and product evaluation, research/ evidenced based studies on transport.

Submission
Please send all ideas, suggestions, and/or announcements, to TransportDispatch@aap.org for consideration by the editorial team.

Questions?
Bridget Cross MSN RN NNP-BC, bkcross@texaschildrens.org
Diana Wilson MSN RN NNP-BC, djwilson@texaschildrens.org
Be informed!! Get involved!!

Join the Section on Transport Medicine listserv® today!

The listserv® allows the transport community to communicate through periodic email messages.

To join the listserv® visit the Section website at www.aap.org/sections/transmed.

Only your name and email address are required.

Sponsored by the Section on Transport Medicine
held in conjunction with the 2012 AAP National Conference & Exhibition

Save the Date!!
2012 Course on Neonatal and Pediatric Critical Care Transport Medicine
October 21-23, 2012
New Orleans, Louisiana

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN®

Save the Date!!
Pediatric Hospital Medicine 2012
July 19-22, 2012
Northern Kentucky Convention Center


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Upcoming Events

National Association of EMS Physicians
Annual Congress
January 12-14, 2012
Tucson, Arizona
http://www.naemsp.org/meetings.html

NeoPREP 2012
NeoPREP® is a 7-day intensive review of neonatal-perinatal medicine that emphasizes the process of evidence-based clinical decision making
January 21-27, 2012
New Orleans, Louisiana

Society of Critical Care Medicine 41st Annual Congress
The SCCM's annual congress is the largest multi-professional critical care event of the year
February 4-8, 2012
Houston, Texas
http://www.sccm.org/Annual_Congress/Pages/default.aspx

2012 Workshop on Perinatal Practice Strategies
GPS for the Neonatologist: Finding Leadership Everywhere
March 30 - April 1, 2012
Scottsdale, Arizona

Guidelines for Air and Ground Transport of Neonatal and Pediatric Patients
3rd edition
Purchase at the AAP online bookstore
http://www.aap.org/goBook.cfm

4th edition coming!
When you mention Hawai’i, thoughts turn to warm weather, sunshine, beautiful beaches, the crystal clear blue waters of the Pacific ocean; a wonderful place to vacation year round with friendly people. The people of Hawai’i are hard working, family orientated, culturally diverse and share an aloha spirit with all. Hawai’i also has a population of approximately 1.3 million people scattered over five main islands.

Of the 1.3 million people spread out cross the state, children under the age of eighteen make up 23% of this population. This is where the Neonatal and Pediatric Transport Team at Kapi’olani Medical Center for Women and Children becomes vital. This critical care specialty team transfers infants and children from multiple locations on the 5 islands to O’ahu institutions for pediatric or newborn care. The members of the team are committed to providing quality and safe care to the keiki (children) of Hawai’i.

Kapi’olani Medical Center for Women and Children is an affiliate of Hawai’i Pacific Health, the states largest health care provider. Kapiolani is recognized as Hawai’i’s leader in care for women, infants and children. With 207 beds, the hospital is Hawai’i’s only 24/7 maternity, newborn and pediatric specialty care facility in the state.

The Kapi’olani transport team was established in 1989. Over the years, the team has evolved into a highly skilled and well respected member of the state's health care community. In addition to serving all hospitals within the state of Hawai’i, which constitutes approximately 500 transports a year, the transport team also participates in international and continental US transports averaging an additional 20 transports annually.

Living in an island paradise offers some unique challenges in transporting children to our facility. The greatest challenge we face is time and distance. Kapiolani is located on the island of O’ahu which is the most populace of all the islands. All flights are done by fixed wing aircraft and travel time varies from the longest flight to Hilo which is a distance of 216 miles or one hour flying time to only 54 miles or 25 minutes by air. In addition to fixed wing transport, Kapi’olani provides transport services for the 14 hospitals located on O’ahu by ground ambulance. Since the hospital does not own its own transport vehicles, we work very closely with both a private air and ground ambulance company. Cooperation with all facilities and transport partners is required for safe and expedient transfer of Hawaii’s children to the higher level of care that is offered by Kapi’olani.

The transport team is always striving to improve patient care and patient transport times by tracking all transports that are done by the Kapi’olani team. We continuously look at ways the team can improve service to the people of Hawai’i. For example, we are in the process of being able to transport patients on ECMO either between islands, on island or to the continental US.

Routine team composition includes one nurse and one respiratory therapist. For critical transpacific transports the team will include either a pediatric intensivist or neonatologist. Eight nurses and six respiratory therapists provide 24/7 coverage 365 days a year. Two medical directors, one neonatologist and one pediatric intensivist assist with overall medical supervision as well as policy and procedure oversight. All transports are under the supervision of the staff PICU doctors or the staff neonatologist on shift.

When the team is not out on transport, we attend all high risk deliveries, support the emergency room, PICU and NICU. We also support the IV team on off hours and weekend shifts. All team members are PALS and NRP instructors and assist with other educational classes. The nurses and respiratory therapists have their national certification in their areas of specialty. Mandatory annual skill competency and air craft safety ensure safe practice and procedure.

It is with great dedication and pride that the members of the Kapi’olani transport team serve the children and the families of Hawai’i and will continue to do so in the future. Thank you for letting us tell you about our specialized transport team here in the middle of the Pacific Ocean. Mahalo and aloha to all.

**Feature your team in our Transport Team Profile!**

Send your writeup to TransportDispatch@aap.org.

Send questions to our Editors at

Bridget Cross MSN RN NNP-BC bkcross@texaschildrens.org

Diana Wilson MSN RN NNP-BC djwilson@texaschildrens.org
The Section on Transport Medicine created the transport team database in 2004 to be used as a reference tool specifically for neonatal and pediatric transport professionals. A link to this resource can be found on the SOTM website at http://www.aap.org/sections/transmed/resourcesTM.htm.

If you would like to add your organization’s information to the database or if you would like to update what is currently posted, please visit the Section website at http://www.aap.org/sections/transmed/transportteamQA.htm to submit a questionnaire.

NOTE: There is no submission deadline. The database is updated quarterly and not confirmed by staff or leaders within the Section.
Extracorporeal membrane oxygenation (ECMO) is a potentially life-saving therapy used successfully in patients of all ages; ranging from neonates to adults with cardiopulmonary failure of many etiologies. Traditionally, ECMO has been used for cardiopulmonary failure or as a bridge for organ transplantation; but the indications have expanded to include extracorporeal cardiopulmonary resuscitation (eCPR) and as a bridge for the placement of mechanical circulatory assist devices (MCAD). Outcomes are improving for children and adults with cardiopulmonary failure due to the support and stabilization comforted by ECMO and MCAD for either recovery of organ function or as a transplant bridge. While many pediatric centers have cardiopulmonary bypass (CPB) or ECMO availability, few have the resources or experience necessary for successful organ transplantation and MCAD programs. In order to more safely manage these types of patients across the spectrum of care, combining the techniques of critical care transport with ECMO support to create a mobile, transport ECMO team can bring the tertiary/quaternary care experience to a patient's bedside for resuscitation, stabilization, cannulation and then transport to a center for definitive therapy.

**Extracorporeal Transport Literature**

Many of the advancements in transport medicine are based upon the military's experience in patient evacuation from the battlefield; this also true for mobile ECMO. The U.S. Air Force (USAF) is responsible for some of the early developments in mobile transport ECMO; a neonatal ECMO team was developed in 1985 based at Wilford Hall Medical Center (WHMC) at Lackland AFB, TX. In 1991, Cornish et al published their early experience of transporting 13 neonates and described ECMO complications believed to be transport-specific; none of which contributed to the overall reported mortality. Prior to this, the ("hidden") mortality of delayed referral to an ECMO center was described by Boeddy et al who postulated that earlier, expedited transfer of critically ill infants to a regional ECMO center would have decreased the mortality of the infants not referred. Subsequently, both The University of Michigan Medical Center and The University of Arkansas published their mobile ECMO transport experiences. More recently, there is a growing body of evidence describing the transport of adult patients using extracorporeal life support therapies including veno-venous ECMO, pumpless extracorporeal lung assist (pECLA), and the placement of ventricular assist devices by specialized ECMO transport teams. Several themes appear in this body of literature; long distance ECMO transport can be safely accomplished, interfacility communication is essential for appropriate patient selection, mobile ECMO requires detailed logistical planning, mobile ECMO has associate risks and does not replace early patient referral, and the qualifications, training and experience of the transport team are vital for successful interfacility transfers.

The 22-year WHMC experience in global mobile ECMO was reported by Coppola et al in 2008; I had the privilege of being a team member and mission commander for several of the reported transports. Coppola's report described the transport of 68 neonates and children by ground and fixed-wing aircraft a mean distance of 1380 miles (range 8-7500 miles) and that survival to discharge for the mobile ECMO cadre was similar to the survival for children that presented to WHMC. The patients included military dependents as well as civilians referred for humanitarian care. Complications reported included membrane oxygen failure (thrombosis), power supply failure, blood warmer leakage, and roller pump failure with subsequent tubing rupture during manual hand-cranking. Indications for mobile ECMO included the referring organizations lack of ECMO services, inability to transport conventionally, inability to wean from CPB, eCPR, and if a patient on ECMO needs specialized services (organ transplantation, MCAD). The global reach of this team presents several unique characteristics that may not be generalizable to most ECMO centers.

1. The distance of the missions requires identification of military aircraft of opportunity, not designated or designed aeromedical ambulances, usually cargo aircraft that are rerouted. Logistically, the mobilization process could take up to 24 hours to accomplish.

2. The extended mission duration required a team size larger than other centers to allow for alternating patient care shifts. The WHMC team could be composed of 10-15 members, including intensivists, nurses, technicians and a surgeon for cannulation.

3. The rigors of flight in military aircraft required a custom built, 740-lb ECMO cart as well as over 1200 lbs of additional and redundant equipment since missions routinely required 12 hours or greater of patient care.

4. For long distance flight, the team utilized veno-arterial ECMO nearly exclusively since the unpredictability of the stressor of flight made the ability to provide full cardiopulmonary support advantageous.

**Failure Mode and Effects Analysis (FMEA) to Design a Mobile ECMO Team**

The proposal to develop a mobile ECMO team at Children's Hospital of Wisconsin (CHW) followed cardiothoracic surgery's decision to perform prescreened, low-risk procedures at 2 distant outreach facilities without intrinsic ECMO capabilities. The organization decided to perform a FMEA, a systematic, prospective, multidisciplinary, team-based risk assessment process. A FMEA is designed to improve patient safety issues before an error or failure can occur. In order to be successful, a FMEA requires a clear, narrowly scoped charter, a team of subject matter experts, development of a process flowchart, identification and analysis of failure modes based on risk assessment and finally, to redesign the process for risk mitigation. A FMEA is a designed to generate a living document where reassessment and reanalysis of the process can occur since potential failure modes may change over time as the scope or practice changes.

In our analysis, the scope of the FMEA was limited to "non-emergent" ECMO by ground ambulance transport for resource support of the cardiothoracic program performing outreach procedures and did not encompass other

Continued on p. 7
potential indication for mobile ECMO. The team included subject matter experts in critical care, transport and ECMO nursing, as well as a perfusionist, a respiratory care practitioner, a biomedical engineer, and a critical care physician/patient safety officer. The FMEA team developed a 14-step flowchart and identified 93 potential failures; the failures identified included human error, equipment failures, communication gaps, missing supplies, and policy or procedural errors. For each potential failure, the team addressed 3 questions: "How likely is this failure to occur" (Occurrence), "How severe might that failure be if it occurred?" (Severity of injury), and "Would the failure be detected before harm resulted?" (Detectability). Each component question is assigned a numeric value as determined by the team of experts. A Risk Priority Number (Hazard score) is calculated by multiplying the numeric values, the values ranged from 1-500. The failure modes with the highest RPN included; lost equipment, incorrect patient information, inadequate anesthetics, lost IV infusions, equipment left at referring facility, unintended extubation, unavailable ambulance, unavailable perfusionist, inadequate ambulance suction, motion on transport, and insufficient medications. Following identification and stratiﬁcation of the RPNs, mitigation strategies were designed and the RPN was recalculated. All mitigation strategies were adopted by the organization prior to the team becoming operational.

One of the major lessons learned during the FMEA process was that transporting patients on ECMO requires a strict organizational process for patient selection, deﬁned interfacility communication, detailed equipment and supply logistics, and patient care that resembles a military-like action plan with procedures detailed in clear protocols. A custom designed ECMO cart was built which incorporated many of the components of the PICU bedside ECMO system (Table 1) and a detailed mobile ECMO supply list was developed to augment the standard transport equipment sets (Table 2). Communication guidelines included direct physician-to-physician communication regarding the underlying medical condition of the patient as well as the unique equipment and supplies necessary for transport incorporated into the standardized transport dispatch and triage form. Following all of these efforts, the team was not utilized.

Once the FMEA for a process is completed, the process outlined and mitigated is intended to remain dynamic and the FMEA should be considered a template and a "living document" subjected to review and revisions as the scope of practice is re-evaluated and expanded. The scope of our mobile ECMO team expanded as the experience with MCAD devices increased as well as the growth of the cardiac transplant and heart failure programs. The patient acceptance process was broadened and reﬁned to include intensivist-to-intensivist communication with a hand-off of patient information. The patient data was reviewed in a multidisciplinary committee of critical care, cardiology, transport team, ECMO coordinators, and PICU leadership personnel in order to determine appropriateness of acceptance and need for ECMO transport services. If accepted for mobile ECMO transfer, further logistical communication regarding ECMO cannula and circuit issues (cannula size and position, tubing diameter, pump and membrane type, and ECMO circuit pressures), blood product availability, and timeline for team arrival are addressed.

The mobile ECMO team has completed 4 missions for children cannulated for ECMO acceptance for mobile ECMO transfer, further logistical communication regarding ECMO cannula and circuit issues (cannula size and position, tubing diameter, pump and membrane type, and ECMO circuit pressures), blood product availability, and timeline for team arrival are addressed. The mobile ECMO team has completed 4 missions for children cannulated for ECMO transfer for either MCAD or transplanted evaluations; all of the patients were weaned off of extracorporeal support and 3 survived.

Table 1: Mobile ECMO Cart Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomedicus Pump</td>
<td>LTV Ventilator</td>
</tr>
<tr>
<td>Biomedicus Hand</td>
<td>8-Baxter AS 50</td>
</tr>
<tr>
<td>Crank</td>
<td>Syringe pumps</td>
</tr>
<tr>
<td>Hollow Fiber</td>
<td>GE DASH Monitor</td>
</tr>
<tr>
<td>Oxygenator</td>
<td>Gas Line Extensions</td>
</tr>
<tr>
<td>Biotrend monitor</td>
<td>ECMO Bar</td>
</tr>
<tr>
<td>Clay UPS</td>
<td>100 ft extension cord</td>
</tr>
<tr>
<td>Gaymar T-Pump</td>
<td>Patient securing device</td>
</tr>
</tbody>
</table>

Note: Rotaflow pump to replace Biomedicus pump in 2012

Table 2: Mobile ECMO Supply List

<table>
<thead>
<tr>
<th>Perfusion Pack</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomedicus Cone (BP-80)</td>
<td>¼ inch tubing</td>
</tr>
<tr>
<td>Arterial cannula</td>
<td>¼ inch straight connector</td>
</tr>
<tr>
<td>Venous cannula</td>
<td>¼ inch x ¼ inch LL</td>
</tr>
<tr>
<td>3/8 x 3/8 x 3/8 Y connect</td>
<td>3/8 x 3/8 x 3/8 Y connect</td>
</tr>
<tr>
<td>3/8 x 3/8 inch connector</td>
<td>3/8 x 3/8 inch connector LL</td>
</tr>
<tr>
<td>¼ inch flow probe</td>
<td>3/8 inch flow probe</td>
</tr>
<tr>
<td>Pressure isolator</td>
<td>¼ x ¼ x ½ Y connector</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oxygenator Pack</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hollow Fiber Oxygenator</td>
<td>Tools</td>
</tr>
<tr>
<td>Plasmalyte</td>
<td>Blades</td>
</tr>
<tr>
<td>Quick prime lines</td>
<td>Tie gun</td>
</tr>
<tr>
<td>Pressure Bag</td>
<td>Gunties</td>
</tr>
<tr>
<td>Gas splitter</td>
<td>60/20/10 ml Syringes</td>
</tr>
</tbody>
</table>

Bedside Bag
1 ml Syringe
1 ml Syringe Guarded Clamps
Syringe Guarded Clamps
Sterile scissors
Allen wrench
Screw driver (multi-head)
Small flashlight
Hemochron Signature Elite
Hemochron power cord
ACT-LR cuvettes

In conclusion, a mobile ECMO team can provide a niche service for an organization and a FMEA as demonstrated can assist in the development and design of a new service line. Many pediatric centers offer both interfactivity.

Mobile ECMO Next Steps and Challenges

Continued on p. 8
critical care transport and in-hospital ECMO services which perform intrafacility ECMO transport for diagnostic purposes (radiographic, interventional catheterization, or surgical), but organizations should consider the challenges of blending the two service lines into a mobile ECMO team.

Determination of Scope of Service. Organizations interested in pursuing a mobile ECMO team need to determine the scope of service prior to beginning transport and the FMEA process we described can serve as a guide. For our organization, next steps could include expansion of the service by mode of transport offered (from ambulance-only to fixed and or rotor wing transport) as well as offering cannulation services for patients referred from non-ECMO centers. This crucial decision will also define the type of extracorporeal support the team provides as well as equipment, supplies and staffing model.

Team mobilization and staffing model. Once scope of service is determined, the staffing model and mobilization of the team can be determined. For our team, since we currently provide services for patients on ECMO, we have the luxury of an extended mobilization time since the referred patient is at an ECMO center. But, if emergency cannulation services are offered, the mobilization and on-call availability of team members would need to be reassessed. Our team size is relatively large with inherent redundancies due to the low-volume, high-risk nature of the service provided; but, this model would need to be reconsidered if the mode of transport changes, patient volume and experience increase, or if healthcare policy dictates a different practice model.

Regulatory and economic considerations. A mobile ECMO team represents a significant resource commitment which needs to be balanced in our current environment of increasing health care costs with declining reimbursement as health policy evolves. Organizations should consider prearranged transfer agreements, medical credentials/privileges, administrative approval for transfer, and other insurance/reimbursement issues prior to transport in order improve mobilization and decrease delays to definitive therapy.
NATIONAL SURVEY OF NEONATAL TRANSPORT TEAMS IN THE UNITED STATES

Kristine A. Karlsen, PhD, APRN, NNP-BC, Michael Trautman, MD, Webra Price-Douglas, PhD, CRNP, Sandra Smith, PhD, APRN, NNP-BC

A Primary Childrens Medical Center, Salt Lake City, Utah; B Indiana University School of Medicine, James Whitcomb Riley Hospital for Children, Indianapolis, Indiana; C Maryland Regional Neonatal Transport Program, Johns Hopkins Hospital, University of Maryland Medical Center, Baltimore, Maryland; and D College of Nursing, University of Utah, Salt Lake City, Utah

ABSTRACT

Objective: Neonatal transport in the United States is a complex process; however, little is known about the neonatal transport team (NTT) workforce. The purpose of this national study was to describe the US NTT workforce.

Participants and Methods: An exploratory, descriptive design that used a Web-based survey questionnaire was used. We identified 398 NTTs, and 345 (86.7%) were enrolled. One survey was completed per team.

Results: Ten NTTs did not complete the survey (response rate: 84.2%). Of the 335 completed surveys, 229 (68.4%) were from unit-based teams and 106 (31.6%) were from dedicated teams. Twenty-six different NTT compositions were used. All except 1 (n = 334) had a registered nurse or a neonatal nurse practitioner as a team member. A registered nurse–respiratory therapist team composition was the most common for unit-based (40.2%) and dedicated (44.3%) teams. Dedicated teams used rotor and fixed-wing modes of travel more frequently, transported further distances, and had higher transport volumes than unit-based teams. The median transport volumes reported suggest that as many as 68,797 critically ill neonates are transported each year.

Conclusions: There is wide variation in many aspects of neonatal transport, including orientation, determination of readiness for independent transport, use of protocols to guide transport care, and quality assurance activities. These results will be useful for (1) evaluating existing transport services, (2) guiding necessary changes in training or services, and (3) aiding programs that seek to develop a neonatal transport program.

Pediatrics 2011;128:685–691
Abstract online at http://pediatrics.aappublications.org/content/128/4/685.abstract.

Mobile ECMO Photos Continued from p. 8
The AAP Board of Directors formed the Task Force on Vision of Pediatrics 2020 in July 2008 to prepare the Academy for the future and to be responsive and supportive of its members in the coming decades. Specifically, the AAP Board of Directors wanted the task force to: 1) identify critical forces and trends that will influence the profession of pediatrics over the next 10 to 15 years; and 2) determine how the Academy will position itself to assist members in responding to change.

The AAP's identified megatrends follows:

- Changing demographic and clinical characteristics of children and families
- Burgeoning health information technology (HIT)
- Ongoing medical advances
- Alterations in health care–delivery system(s)
- Growth of consumer-driven health care
- Dynamics of pediatric workforce
- Disasters (environmental, infectious, man-made)

Each megatrend describes a particular challenge facing children and the field of pediatrics. As part of its work, the Task Force members developed best-case, worst-case, and most-likely scenarios for these eight megatrends. In addition, to assist the field, they identified needs in the most likely scenario. These needs are described in Section 2: Transforming the AAP and Section 3: Transforming Your Practice. The megatrends are described more fully below.

**Information on the project can be found on the Task Force’s web site at [http://www.aap.org/visionofpeds](http://www.aap.org/visionofpeds).**

**Megatrend 1: The clinical, social, and societal demographic mix of patients and families is increasingly complex.**

Adult health is founded on child health, that the leading predictors of child health extend far beyond medical care, that more and more children and families have long-term chronic health issues, which are complex medically, behaviorally and/or cognitively, the U.S. population is becoming more diverse, and that increasing numbers of U.S. children are living in poverty, putting them at increased risk for violence, abuse, chronic physical and mental health problems and other negative health outcomes.

**Megatrend 2: Increased advances in information technology applied to the practice of healthcare and pediatrics.**

EMRs, EHRs and Health Information Technology are the connective tissue of any future health care delivery system, that Pediatric practices will need to be increasingly "connected" to survive, and there will be acceleration of advances in health information technology.

**Megatrend 3: Advances in medical knowledge, technology, diagnostics, and treatment.**

Advances in medical knowledge, diagnostic tools, and treatment options are accelerating, and increased access to medical information and diagnostic tools from a variety of sources e.g. the media and Internet, prompts patients to increasingly seek counseling and/or request diagnosis and treatment options whether or not medically viable.

**Megatrend 4: The healthcare delivery system will change and evolve.**

The future healthcare delivery system will be significantly different from what exists today, that the status quo will be disastrous for the U.S., both economically, and societally, models of how to reshape the healthcare delivery system will test and validate the values of the U.S. as a nation, and there is growing acceptance within the profession and in the public eye, that our healthcare system should provide health care that is a shared responsibility of the individual, providers, and society and provides access to affordable, comprehensive, high quality coverage in a medical home. Patients and their families will expect and demand high quality care, will increasingly utilize quality data and anecdotal feedback to draw comparisons between physician practices, and that "quality" will drive health care delivery in the future in whatever form it may come.

**Megatrend 5: There will be an increase in the consumer-driven nature of society and healthcare.**

The American public has a growing desire for accountability and transparency in healthcare, causing consumers and consumerism to substantially drive and shape business in general, that the "online" world is completely and fully integrated into society; both old and new media present opportunities for sharing information which impacts parents' choices and their relationships with providers, and also the spread of incorrect or misleading information.

**Megatrend 6: There are concurrent and increasing needs for both specialists and primary care providers in order to make the Medical Home model work in the absence of a sufficient supply (and education) of providers.**

The workforce in pediatrics is facing significant change in the future as young pediatricians exert a new set of values in their approach to career, pediatricians are challenged by the need to accommodate more complex medical care while substantially expanding their role in preventive and mental health work, work through great financial challenges related to medical student debt and explore new and innovative ways to work with non-physician health providers to provide primary care to children.

**Megatrend 7: There will be increased economic, nutritional, and environmental threats to the health of the world's children (both as a general trend and catastrophic events that include natural, environmental, and man-made disasters).**

There will be increased frequency and severity of economic, nutritional, and environmental threats to the health of the world's children, systems are not in place to prepare families to address the health needs of children in disasters, and the impacts of disasters, physically and psychologically will be a greater part of pediatric practice both in terms of teaching prevention and survival skills, as well as emergency community response.

**Megatrend 8: Globalism will increasingly affect children's health.**

Children's health is impacted by facilitation of travel, migration, and industrialization, which facilitates the spread of diseases and other health risks such as obesity and diabetes, that centers of medical quality for particular disease states or treatments exist throughout the globe, and physicians are increasingly seeking international experiences and connections.
C ROBERT CHAMBLISS MD BEST PAPER AWARD

Pilot Study of the Pediatrics Early Warning System (PEWS) During Pediatric Interfacility Intermediate-Level (ACLS) Transports

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Purpose: Our freestanding children’s hospital implemented PEWS on non-ICU inpatients two years ago. PEWS is a physiology-based nurse assessment tool that serially scores and trends respiratory, cardiovascular and neurobehavioral status. Additional high-risk markers can be assigned (Table). Internal and external data demonstrate that worsening PEWS scores are associated with imminent patient deterioration, need for ICU care and resuscitation events. We postulated that through Emergency Transport Service Team (ETS) application of our inpatient PEWS to ACLS patients at the time of ETS field evaluation, we could reduce the number of transported Medical-Surgical patients who experience early deterioration after admission. Moreover, we aimed to eliminate indeterminate-status transport patients requiring a brief PICU triage evaluation upon transport completion (“fly-bys”).

Methods: Our ETS team (annual volume >4000) transports approximately 2500 ACLS children each year for Med-Surg admission. We have previously proven the validity of our pre-transport triage process for differentiating ACLS (ETS RN and RT) vs. Critical Care-level (Advanced Scope ETS RN, RT, ± MD) transports, with a “failure” rate of <1/1000. Prior to the pilot, a PEWS curriculum was delivered to all ETS members, including test scenario patients. Pilot patients with concerning PEWS scores (≥5 or 3 [+ maximum] in any individual category) per ETS were discussed with the medical control physician during transport, and a destination confirmed.

Results: PEWS scores were assigned to 602 consecutive ACLS patients during a 15 week period in 2010. Concerning PEWS scores were present in 15 (2.5%). Following discussion, 8 of these patients were changed to PICU status (PEWS ≥6: 3/3; ≥5: 2/2; 5: 1/6; “max 3”: 2/2). Notably, 0/594 patients triaged to Med-Surg required unplanned transfers to PICU within 4 hours (our organization marker of inappropriate triage). Three “fly-bys” occurred, all within the first five weeks of the pilot.

Conclusion: PEWS is an increasingly utilized marker of pediatric non-ICU inpatient potential deterioration. Application of this score by transport teams during the interfacility transport process can accurately identify children at risk for imminent deterioration after admission, resulting in appropriate unit assignment and markedly reduced unplanned escalation of care. The inpatient Med-Surg PEWS score as assigned by ETS RNs was completely translatable to the transport setting. Undesired and inefficient triage “fly-by” assessments can also be reduced.

BEST-IN-TRAINING PAPER

Pediatric Critical Care Transport In the Primary Care Setting: Is This Where We Should Be?

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Purpose: Approximately 200,000 infants and children in the United States are transported each year from one hospital to another for specialty neonatal or pediatric care unavailable at their community hospitals. Interfacility transports are commonly performed by specialty pediatric critical care transport (SPCCT) teams. Ill children may present to non-hospital settings such as primary care offices or urgent cares and require emergency care and transport. Some non-hospital settings are ill-equipped to manage an unstable child, and the care providers must decide the appropriate means of transport: EMS or SPCCT. Herein, we sought to describe a single-center’s experience with specialized critical care transport from these non-hospital settings.

Methods: This IRB-approved study sought to evaluate retrospectively children (0-18 years) transported by our SPCCT team from non-hospital settings in 2010. Data were extracted from an institution-specific database. When appropriate, statistical tests were applied including Fisher’s exact test and Mann-Whitney U using SPSSv17.0 software.

Results: Twenty-six patients were identified with an average age of 5.4±7.14 yrs and weight of 21.4±21.6kg (mean±SD). Of the 22 patients (84.6%) with insurance, Medicare and private insurance were equally represented. Half of the transport requests identified respiratory distress as the primary complaint and the average SPCCT response time was 48±21min. The pre-transport care included IV access in 9 (34.6%) of patients, IVF bolus in 7 (26.9%), and antibiotics in 4 (15.4%) of patients. Albuterol treatment was provided in 13 (50%) of patients and 9 (34.6%) received steroids. After arrival of the SPCCT team an IV was placed in 6 (23%) additional patients, 5 (19.2%) got an IVF bolus, and 1 (3.8%) received antibiotics. Four (15.4%) children were transported to the children’s hospital emergency department, of which 3 (11.5%) were discharged home. Six (23%) were admitted directly to the PICU, 1 to the NICU, and the remainder (15, 57.5%) to the general care floor. For the 6 PICU patients the median LOS was 7.8; 1.7–9.3days (median; IQR). All patients survived to hospital discharge with a hospital LOS of 2.1; 0.8–5.7days. Critical care transports in this cohort had billed charges of $2660.14±940 (mean±SD). Posthoc analysis of urgent care vs. physician offices showed that children originating in the urgent cares were more likely to be discharged home (p=0.046) though no differences existed in PICU or hospital LOS.

Conclusions: Ill children present to primary care offices and urgent cares and require emergency care and transport. The most common SPCCT interventions are IV access and IVF bolus. Response times for SPCCT teams are typically longer than EMS and most transported children are not in need of critical care. Our small cohort rarely demonstrates application of additional critical care interventions beyond those provided by the referring office or urgent care, suggesting that SPCCT team response to non-hospital setting might be resource overutilization.

www.aap.org/sections/transmed
State of the Interfacility Transport—What's Changed in a Decade?

October 16, 2011 – Special Section on Transport Medicine Program
Boston, Massachusetts
Facilitator: Michael Stroud, FAAP
Chairperson: Michael Trautman, FAAP

Thanks to all who joined the Section leadership at their special academic and scientific program in Boston – as part of the Academy's National Conference & Exhibition. "State of the Interfacility Transport—What's Changed in a Decade?" featured an interactive session designed to develop a consensus statement on the important issues relevant to inter-medical transports. Brainstorming sessions occurred among participants with the expressed purpose of using those discussions as a starting point for the revision of the "State of Interfacility Transport" document published in Pediatric Emergency Care over a decade ago. Visit http://aap.org/sections/transmed/StateofPIT.pdf to review the previously published document.

Areas covered during the special Section Program included:
- Medical Director (Role, Qualifications, Training)
- Accreditation and Benchmarking
- Team Configuration and Economics of Transport
- Justification of teams, collaboration, and regionalization
- Training, Simulation, Safety, and Work Hours
- Disaster Medicine and International Transport
- Clinical Research
- EMTALA and the Laws of Transfer

The slides from the SOTM Program can be found on the Section's home page at http://www.aap.org/sections/transmed (or directly at http://www.aap.org/sections/transmed/SOTM_SlidePresentation-2011.pdf)

If you would like more information on the session or if you have ideas on how to make the next iteration of the "State of Interfacility Transport" as strong and effective as possible, please contact Dr Michael Stroud at StroudMichaelH@UAMS.EDU.