

In a nutshell



## Pediatric Sepsis: Updates and Controversies

Submitted by

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PRIME Node

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**N**ot just a “regular fever”: It is any parent’s worst nightmare. You bring your child to the doctor for what you think is a “regular fever” but within hours, she is admitted to the hospital and is in the intensive care unit with septic shock. You are told that she has a severe infection in the blood that can affect all of her organs. She needs multiple intravenous lines, fluids, antibiotics, and medications to support her blood pressure, and the doctors all seem worried.

This nightmare is a reality for more than 75,000 children across the US (and for thousands more worldwide) who are treated each year for possible sepsis. Sepsis is a life threatening condition caused by the body’s response to severe infection. It is the most common cause of mortality in pediatric intensive care units in the US, and accounts for over \$5 billion in US health care expenditures each year. Prompt recognition and treatment of children with potential sepsis can save lives. Over the past decade there have been significant advances in pediatric sepsis research, quality improvement efforts, and even legislation. This article will review the latest updates in pediatric sepsis and highlight areas for potential future investigation and other endeavors.

**New Pediatric Sepsis Guidelines:** The most recent pediatric sepsis treatment guidelines were published by the American College of Critical Care Medicine in *Critical Care Medicine* in June (Davis et al CCM 2017). The mainstays of pediatric sepsis treatment are unchanged from prior guidelines, and include: prompt recognition of children with possible sepsis, timely antibiotic and crystalloid fluid administration, reversal of fluid refractory shock with vasoactive agents, and transfer to higher level of care when necessary.

Three notable recommendations are presented in these guidelines: 1) to *develop institutional sepsis screening tools*, 2) to *develop institutional sepsis treatment protocols*, and 3) to change the first-line vasoactive agent for pediatric septic shock to *epinephrine instead of dopamine*. Below I will discuss each of these changes and the evidence behind them.

**Sepsis Screening:** One of the main challenges in pediatric sepsis is finding it in the first place. Children often present to care in compensated

shock: meaning that although their heart rate is high (tachycardia), their blood pressure is normal until late in the illness. However, many children with fever from typical viral illnesses also have tachycardia and the child with sepsis is often difficult to distinguish. From these children this challenging process of sepsis recognition in children is analogous to finding the proverbial needle in a very large haystack. We have recently shown that the development of an electronic health record vital sign-based screening tool in combination with bedside clinical assessment can improve our ability to recognize children with sepsis (Balamuth AEM 2017). The recommendation to institute some sort of pediatric sepsis screening protocol is based on findings from several investigations including our own (Cruz Pediatrics 2011, Lane Pediatrics 2016). Because no specific tools have yet been studied across multiple institutions, the guidelines do not recommend a particular tool- just that a hospital should have some sort of sepsis screening process in place to improve recognition of children with potential sepsis.

**Sepsis treatment protocols:** There has been increasing evidence over the past several years that standardizing, or protocolizing, sepsis care can lead to improvements in the timeliness of care (Cruz Pediatrics 2011, Larsen Pediatrics 2011, Paul Pediatrics 2012, Paul Pediatrics 2014). These teams have demonstrated improved time to antibiotic and fluid administration after instituting standardized sepsis treatment algorithms and order sets. Perhaps more importantly, increasing evidence is emerging that these protocols are also associated with improved patient outcomes including decreased organ dysfunction, acute kidney injury, and mortality (Paul Pediatrics 2014, Arkan JPeds 2015, Balamuth PCCM 2016). These data, along with longstanding evidence in adults, led to the recommendation that all institutions have in place a sepsis treatment algorithm for children. The Children’s Hospital Association is currently leading a large multi center quality improvement effort: the Improving Pediatric Sepsis Outcomes, or IPSO, collaborative in attempt to standardize implementation of sepsis programs across more than 40 children’s hospitals in the US. The goal of the collaborative is to reduce sepsis-related mortality by 75% by the year 2020.



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This project is supported in part by the Health Resources and Services Administration (HRSA), Maternal and Child Health Bureau (MCHB), Emergency Medical Services for Children (EMSC) Network Development Demonstration Program under cooperative agreements U03MC00008, U03MC00003, U03MC22684, U03MC00007, U03MC00001, U03MC28845, U03MC00006, and H3MC26201. This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government. MCHB/HRSA Contact: Diane Pilkey, RN MPH [DPilkey@hrsa.gov](mailto:DPilkey@hrsa.gov).

**Vasoactive agents:** The final change in the guidelines is to recommend epinephrine as the first-line agent for fluid refractory shock instead of dopamine. This recommendation is based on data in adults and one recent pediatric trial showing increased mortality with dopamine. Because children more commonly exhibit cold shock, epinephrine is the agent of choice. For children with warm shock, norepinephrine should be used.

**Research priorities:** Although we have made significant progress in terms of pediatric sepsis recognition and treatment, we still have much work to do to improve these processes of sepsis identification and early therapies, as well as to improve care for the sickest children with septic shock in the ICU, where mortality still approaches 15-20%. PECARN, funded through NICHD, is currently working to use electronic health data to build an advanced clinical prediction model to identify children at highest risk for organ dysfunction from sepsis ("PED Screen"). In addition, PECARN is in the planning stages of a large clinical trial evaluating the best type of IV fluids for septic shock, for which we have received initial funding through the Trial

Innovation Network/National Center for Advancing Translational Science.

**Legislation:** State governments have taken notice of the recently published data and have started to pass legislation to enforce adherence to sepsis recognition and treatment protocols. New York State was the first to pass "Rory's Regulations" named for Rory Staunton, a boy who died of unrecognized septic shock in 2012. The initial post implementation adult sepsis data from New York was published this spring, (Seymour NEJM 2017), and demonstrated decreased sepsis mortality following implementation. Similar regulations have been recently passed or are under consideration in Illinois, Wisconsin, and Pennsylvania so keep your eyes out for this in coming months.

Finally, *World Sepsis Day* is coming up on September 13 so be alert for hospital, state, and national sepsis related activities in your area. Thank you for the work that you do every day in pre-hospital and hospital care, in addition to advocacy and policy we strive together to do the best we can for the sickest children. ■

## Good Clinical Practice Tip

### ICH GCP E6 (R2) Addendum: Highlight on Quality Management

Submitted by

Deveree Partridge

PECARN Project Manager, DCC

As we all know by now, ICH GCP E6 (R2) is the first update to the GCP guideline in 20 years. One of the most substantial changes is the addition of section 5.0, Quality Management (QM). This new section, while directed at sponsors, is important for investigators and sites to understand as it outlines the need for a risk-based approach to quality management. The new guidance asserts that a risk-based QM system be implemented throughout the trial, from protocol development, during enrollment and follow-up, through closeout visits across sites. Section 5.0 clearly outlines what criteria to follow in order to approach your trials with risk-based glasses on. (I bet they are rose-colored, too!)

#### Risk-Based Quality Management



You can find the ICH E6 (R2) Guideline, including section 5.0 Quality Management, in its entirety at: [www.ich.org](http://www.ich.org). ■







## PECARN CORE DATA PROJECT

The PECARN Core Data Project (PCDP) is an observational descriptive study to identify basic epidemiological information on all ED visits from each participating hospital in PECARN. This data has been instrumental in hypothesis generation and grant acquisition for PECARN. The PCDP database has complete data for 2002-2016. The Public Use Data Set request form can be found at <http://www.pecarn.org/study/Datasets/StudyDetails?studID=2>.

15 of 18 sites submitted in XML format last year. We are working with each site to try to achieve 100% XML submission for the 2017 data. The DCC staff is offering one-on-one training webinars to any site interested.

## ARGININE

Two abstracts ("Pediatric Emergency Department Use of Intranasal Fentanyl to Treat Pain in Children with Sick Cell Disease and Its Impact on Discharge Rates: A Multicenter Perspective" and "Pediatric ED Adherence to the 2014 NHLBI Guidelines Targeting Analgesic Therapy in the Management of Vaso-Occlusive Pain Episodes in Children with Sick Cell Disease: A Multicenter Perspective") were submitted for presentation at the 45<sup>th</sup> National Sick Cell Disease Association of America (SCDAA) Convention to be held in Atlanta, GA in October 2017, and are currently being drafted into manuscripts. An additional manuscript plan on the use of IV fluids in Sick Cell Disease has been developed. Grant writing for the phase III clinical trial will begin later this year.

## ESETT

ESETT continues to enroll at or above the expected pace. We have enrolled more than 150 children! Nice work!

We recently received notice of award for the ancillary PK study and we are soliciting participation from PECARN sites. Unfortunately, the EEG ancillary study was not funded.

There will be protocol refresher training at the September 2017 PECARN meeting and training to orient sites to the PK/PD study.



## ASSESS

As of July 1st, 806 participants have completed the 3 year follow up survey (92% follow up rate). One of the main manuscripts, Reliability and Validity of a Two-Question Alcohol Screen in the PED (Linakis) was published in *Pediatrics*, while a methodology paper was published in *Pediatric Emergency Care*. One brief report, Risky Adolescent Behavior (Chun), was submitted to Academic Emergency Medicine in July and two manuscripts, Relationship of NIAAA Screen Items to Other Drug Use (Spirito) and Mental Health Symptoms (Ranney), are currently under GAPS review. Several other manuscripts are currently in progress, including the main manuscript on the predictive validity of the NIAAA two-question screen.

## BIOSIGNATURES I & II

The Biosignature II study is actively enrolling at all 18 PECARN centers. In this study, we plan to enroll approximately 2800 febrile infants 60 days of age and younger who are being evaluated for bacterial infections in the ED. The main goal is to obtain sequential samples for RNA analysis to assess the stability of the "RNA Biosignature". In addition, we plan to test a newer, more rapid turn-around platform for RNA analysis. Enrolled subjects will be categorized into 6 cohorts, based on 4 "infection categories" and 2 different control categories. We are quickly approaching the 1000 patient enrollment mark. We have recently initiated gathering a new group of data elements at all sites, including initial clinical/respiratory assessment, initial vital signs, and antibiotics at ED discharge. Finally, we have seen several Biosignature I manuscripts come to publication in addition to the original *JAMA* publication. In the past few months, Biosignature I manuscripts have been accepted for publication in *Pediatrics*, *JAMA Pediatrics* and *Annals of Emergency Medicine*.

## PROBIOTICS

The Probiotics study completed enrollment of 970 children, aged 3 – 48 months, with Acute Gastroenteritis (AGE)! Enrollment began in July 2014 and completed in June 2017, with 10 PECARN sites participating. The follow-up period for this study will continue for 12 months, until June 2018. Follow-up rates remain high at >90% overall. Manuscript Analysis Plans (MAPs) continue to be developed from the 16 Manuscript Analysis Request Forms (MARFs) submitted by the study team.

## TIC-TOC

We anticipate enrollment for the Traumatic Injury Clinical Trial Evaluating Tranexamic Acid in Children (TIC-TOC) trial late this fall! This is a pilot and feasibility trial studying the use of TXA for children with hemorrhagic torso and head injuries. The pilot study will be conducted at UC Davis Health System, Primary Children's Hospital (University of Utah), Nationwide Children's Hospital (Ohio State University), and the Children's Hospital of Philadelphia (University of Pennsylvania). We have actively been working with our collaborators and the DCC on developing study-wide consensus on neurosurgical and transfusion recommendations, study drug compounding, protocol finalization, and preparation for a September training meeting at the PECARN meeting. We have also submitted an ancillary grant to conduct biomarker and pharmacokinetics/pharmacodynamics testing during the trial. We are very excited to get started enrolling into this important trial!

## PECARN PED SCREEN

The PED SCREEN project addresses the critical need to improve pediatric sepsis outcomes by developing methods to accurately identify at-risk children presenting for emergency care. The project will capture electronic health record (EHR) data to create a multi-center registry with the ultimate goal of improving the detection and treatment of pediatric sepsis in the emergency department (ED) setting. To accomplish this, we will automate the determination of organ dysfunction in children with sepsis directly from structured and narrative data in an expanded multicenter EHR patient registry. The data will be used to derive and validate a prediction model of pediatric sepsis within 48 hours using ED EHR data from the first 4 hours of care. Innovative deliverables from this project include the existence of a broad and rich EHR registry, an automated process of outcome determination, and a prediction model of risk of sepsis.

## THAPCA

This past Spring, sites were strongly encouraged to send study results letters to families whose children were enrolled into the In-Hospital Trial. The DCC wrote a "layman's terms" letter and then each site could personalize the letter before sending it to the families. Most sites needed to receive IRB approval before sending the letters. Also, the DCC staff continues to work with authors on secondary manuscripts related to the THAPCA trial.

(Continued from page 3)

### FLUID

The DKA FLUID study has successfully completed enrollment and is now undergoing analysis. We enrolled approximately 1400 children with DKA, and 400 children with Type 1 diabetes with no history of DKA at 13 PECARN centers! The abstract for the main manuscript was presented at the 2017 PAS and SAEM meetings. Including the main manuscripts, there are approximately a dozen manuscripts based on study results currently being prepared. Prior to enrollment completion, we published two manuscripts in *Pediatric Diabetes* as well as presented several abstracts at national meetings. We really appreciate the collaboration from so many people!

### TBI KT

The main results of the study regarding the change in cranial CT with implementation of clinical decision support were published in *Pediatrics* in April 2017. A secondary analysis is ongoing regarding the change in CT rates within specific groups of children who were not at low risk of clinically-important traumatic brain injury.

### ED-STARS

ED-STARS Study 2 launched enrollment on July 24, 2017 with 5 sites actively enrolling at start-up. There are 15 PECARN sites participating. New for Study 2 is the Computerized Adaptive Screen software, which was developed to validate the prediction of suicide attempts. The Whiteriver site is continuing to complete 3 and 6 month follow-up interviews for Study 1. The Study PIs and the team at the DCC continue their work on approximately 7 Manuscript Analysis Plans (MAPs). The DSMB met on June 6, 2017 and they approved the continuation of the ED-STARS study.

### PUBLIC USE DATASETS

Study data sets can be downloaded directly from the PECARN website at <http://www.pecarn.org/studyDatasets/>.



### PECARN REGISTRY

The PECARN Registry project has developed an emergency care visit registry from electronic health record data for pediatric patients at 7 sites. The Registry currently contains data from all ED visits from the sites for calendar years 2012 through July 2017. Each site transmits data to the DCC 4 weeks after completion of the calendar month to allow for maturation of the data. Comprehensive data quality assurance rules have been automated to assess data quality and validation of the transmitted data.

The Registry is currently being used to directly populate stakeholder endorsed pediatric emergency medicine quality of care performance measures and has derived achievable benchmarks for each of the measures. Each month we successfully distribute over 475 provider-level and site level report cards. Data are currently being analyzed to determine the effect of the report cards on variation of care. The Registry Expansion project is happily on-boarding 3 new sites. ■

## Federal Corner

### Health Resources Services Administration Update

**On June 16, 2017, Dr. Elizabeth (Beth) Edgerton** left government service. PECARN and other advocates for improving the emergency care of children will miss working with Beth. Beth served in the HRSA MCHB for six years, first as the branch chief for the EMSC and Injury and Violence Prevention Branch and as the director for the Division of Child, Adolescent, and Family Health. As a pediatric emergency care physician, an academician and a program administrator, Beth spent her career working in the fields of EMSC, injury prevention, and clinical preventive services. As a former targeted issues grantee, she understood PEM research from the viewpoint of the frontline researcher to the administrative and policy aspects. All of us in PECARN will miss Beth, and we wish her well in the next steps of her life. Diane Pilkey will continue to provide support and both she and EMSC Branch Chief Theresa Morrison-Quinata will be the HRSA Points of Contact for PECARN.

**Envisioning the Future of Maternal and Child Health Research Networks:** On July 13-14, HRSA's Maternal and Child Health Bureau held a meeting of the thirteen MCHB-funded research networks, including PECARN. The meeting offered an opportunity for the networks, which include both clinical and nonclinical programs, to share information on best practices in research and patient recruitment, workforce development, network sustainability, demonstrating impact and translational research. Dr. Ruddy and Nicole McClanahan attended for PECARN.

**New HRSA Administrator:** George Sigounas, MS, Ph.D., became Administrator for HRSA on May 1, 2017. Dr. Sigounas spent 23 years as Professor of Medicine at the East Carolina University's Brody School of Medicine in Greenville, NC where he helped establish the Bone Marrow Transplantation Program. From 1987-94, Dr. Sigounas was a scientist and researcher at the National Institutes of Health and the Naval Medical Center.

### EMSC Roadmap

The EMSC Program, with the support of the Atlas Research, engaged a wide variety of EMSC stakeholders to inform the development of the EMSC 5-Year Roadmap to help inform future EMSC work. This Roadmap presents stakeholder perspectives on how the EMSC program can use its finite resources to navigate a changing healthcare landscape, further demonstrate impact on its mission, and advance pediatric outcomes throughout the emergency medical system of the future. The draft and final EMSC 5-year Roadmap were shared with contributors this summer for final review. The Roadmap can now be found on the EIIC website at: <https://bit.ly/2txh43i>

### Hot Topic

EMSC is looking for feedback on a 2017 Hot Topic that EMS should focus on with the assistance of our contractor, Atlas, who will be developing a White Paper. The first White Paper focused on the National Pediatric Readiness Project. Please send suggestions to [HRSAEMSC@hrsa.gov](mailto:HRSAEMSC@hrsa.gov).



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## Federal and National Partners Update

**EMS Agenda 2050:** In 1996, the National Association of State EMS Officials (NASEMSO), along with the EMSC program and the National Highway Traffic Safety Administration (NHTSA) published the EMS Agenda for the Future. In the more than 2 decades since the initial publication, prehospital care has become far more data-driven and evidence-based. Throughout 2017 and 2018, EMS community members and stakeholders (including the public) will be encouraged to assist in writing the EMS Agenda 2050, which hopes to set forth a vision for what the next 3+ decades of prehospital care and research will target. Dr. Marianne Gausche-Hill provides pediatric emergency medicine expertise for the Technical Expert Panel. Additional information and links to participation are available at <http://emsagenda2050.org/>. There are several public meetings beginning this fall to get stakeholder input. These are listed under upcoming events (see upcoming events below).

**NASEMSO Pediatric Emergency Care Council:** The Pediatric Emergency Care Council (PECC), a council of the National Association of State EMS Officials (NASEMSO), provides a forum for networking, sharing best practices, and promoting policies and recommendations specific to emergency medical care for children. The PECC maintains a vision to improve health outcomes for children by promoting an emergency medical care system that addresses the unique needs of children. This is achieved through a mission to provide leadership, promote policies and research, and share resources to improve the emergency medical care system for children. The PECC will next meet face to face during the NASEMSO meeting October 9-12 in Oklahoma City. For more information, see: <https://www.nasemso.org/Councils/PECC/index.asp>

**The Assistant Secretary for Preparedness and Response (ASPR)** of the U.S. Department of Health and Human Services, leads work in prevention, preparation, and response to public health emergencies. ASPR has initiated a contract to explore the development of an inventory of trauma, emergency and burn capabilities in the United States. The objective of this project is to create a comprehensive national inventory of EDs, trauma centers, and burn centers for adults and children. It also requires maintaining and updating this inventory database. The initial year, which is underway, is focusing on engaging stakeholders and assessing what work has been done in this field.

**The National Pediatric Readiness Project (NPRP)** is a multiphase quality improvement (QI) initiative to ensure that emergency departments (EDs) have the essential resources and guidelines in place to provide care to children with medical or surgical emergencies. This collaborative initiative includes partnerships with the Emergency Nurses Association (ENA), the American Academy of Pediatrics (AAP), the American College of Emergency Physicians (ACEP), and EMSC. There are over 1,100 EDs that have participated in 2016 and 2017 by conducting a reassessment of their facility as part of continuous QI efforts. State and territory participation is shown here: [https://tableau.utahdccc.org/t/nedarc/views/PediatricReadinessQualityImprovementEffort/PediatricReadinessDashboard?embed=y&:showShareOptions=true&:display\\_count=no&:showVizHome=no%20v](https://tableau.utahdccc.org/t/nedarc/views/PediatricReadinessQualityImprovementEffort/PediatricReadinessDashboard?embed=y&:showShareOptions=true&:display_count=no&:showVizHome=no%20v).



**PEDIATRIC EMERGENCY CARE  
APPLIED RESEARCH NETWORK**

## EMSC Innovation and Improvement Center (EIIC) Updates

### Current EMSC Collaborative Improvement & Innovation Network (CoIIN)

In 2015, HRSA selected one of the 10 EMSC performance measures (PMs) for a QI initiative, known as CoIIN, to support states in their effort to reach the EMSC Program target by 2017. The performance measure that was selected was the percent of hospitals recognized through a state-wide, territorial, or regional standardized system capable of stabilizing and managing pediatric medical emergencies. At present, 14 states are involved with CoIIN, which will be completed in December of 2017. States are developing sustainability plans to ensure success following the completion of the collaborative. There are plans to host national webinars in 2018 to share best practices which can be adopted by other states and territories. More information is available here: <https://emscimprovement.center/categories/qi-collaboratives/>

### Upcoming Pediatric Readiness Quality Collaborative

Based on findings from the 2013 National Pediatric Readiness Assessment, the EIIC will launch the First National Pediatric Readiness Quality Collaborative in 2018 to support efforts in states and territories at the local level to meet the emergency care needs of children. The Collaborative will support 20 teams across the U.S. to improve the capabilities and quality of care provided to pediatric patients across the nation. Using a train-the-trainer model, participants will be supported through targeted quality improvement education, the provision of tools and resources to support local efforts, and sharing of best practices. Each Trainer will work with Pediatric Champions at each of the Affiliate Sites to develop and implement QI plans targeting key gaps in pediatric readiness. Each intervention will form the basis for local and regional quality improvement efforts as part of the collaborative activities.

The application online is opened and can be accessed here: <https://emscimprovement.center/collaboratives/PRQuality-collaborative/prquality-collaborative-documents-actions-join/>. ■  
Deadline to submit a Letter of Intent is September 22, 2017.

### Upcoming Events

- **September 15-19, 2017:** American Academy of Pediatrics Annual meeting in Chicago. Registration is now open: <https://shop.aap.org/2017-national-conference-exhibition/>
- **September 25, 2017:** EMS 2050 Agenda public meeting. Silver Spring, MD
- **October 9-12:** NASEMSO fall meeting and regional meetings in Oklahoma City. Registration is now open: <https://www.nasemso.org/Meetings/Fall/FallMeeting2017.asp>
- **October 29-November 1:** American College of Emergency Physicians (ACEP) meeting in Washington, DC. Registration is now open: <https://www.acep.org/sa/>
- **November 7, 2017:** EMS 2050 Agenda public meeting. Minneapolis, MN
- **January 17, 2018:** EMS 2050 Agenda public meeting. Los Angeles, CA
- **March 1, 2018:** EMS 2050 Agenda public meeting. Dallas, TX



# Summaries of Recent PECARN Publications

Compiled by  
PECARN Project Managers, DCC

Publication of results is the way PECARN delivers research findings to clinicians and to the public and helps impact health outcomes in children. These recent PECARN manuscripts describe important findings in the areas of head injury, alcohol screening, cervical spine injury and firearm injuries. Read all about it!

## SUMMARY

**Cervical Spine Injuries in Children Associated with Sports and Recreational Activities.**

Children with cervical spine injury (CSI) from sports or recreational activities (SRA, n=179) were compared to other types of pediatric CSI (n=361) and SRA pediatric injuries with no CSI (n=180). SRA-injured children with focal neurologic findings, neck pain complaints, diving injuries, or an axial loading impact had an increased chance of CSI. SRA-CSI were more frequently spinal cord injury without radiologic abnormality or isolated injuries compared to other mechanisms (mostly motor vehicle related). Football, diving, and bicycles were activities associated with CSI. This study guides physicians to correct diagnostic evaluation for possible CSI and lists activities associated with CSI that may benefit from preventative measures.

Babcock L, Olsen CS, Jaffe DM, Leonard JC; Cervical Spine Study Group for the Pediatric Emergency Care Applied Research Network (PECARN). Cervical spine injuries in children associated with sports and recreational activities. *Pediatr Emerg Care*. 2016 Sep 30. [epub ahead of print] PubMed PMID: 27749628.

## SUMMARY

**Individual and Neighborhood Characteristics of Children Seeking Emergency Department Care for Firearm Injuries Within the PECARN Network.**

This study analyzed 1,758 ED visits for pediatric firearm-related injuries during 2004-2008. Of these visits, assault-type injuries were most common among adolescents and unintentional injuries were most common among younger children. The majority of patients were male and between the ages of 10-18. African-American children disproportionately sustained assault and unintentional injuries (68.2%). Caucasian children comprised the majority, 10 out of 21, of self-inflicted injuries. Overall, male adolescents living in neighborhoods with high levels of concentrated disadvantage had an elevated risk for firearm injury. This study offers insight into the burden of pediatric firearm injuries and the key responsibilities of ED physicians for intervention.

Carter PM, Cook LJ, Macy ML, Zonfrillo MR, Stanley RM, Chamberlain JM, Fein JA, Alpern ER, Cunningham R; The Pediatric Emergency Care Applied Research Network (PECARN). Individual and Neighborhood Characteristics of Children Seeking Emergency Department Care for Firearm Injuries Within the PECARN Network. *Acad Emerg Med*. 2017 Apr 19. [Epub ahead of print]. PubMed PMID: 28423460.

## SUMMARY

**Use of Traumatic Brain Injury Prediction Rules With Clinical Decision Support.**

This study determined whether implementing traumatic brain injury (TBI) prediction rules and providing risks of clinically important TBIs (ciTBIs) with computerized clinical decision support (CDS) would reduce computed tomography use for children with minor head trauma. The trial was conducted at 13 sites on patients who were <18 years old with minor blunt head trauma.

Intervention sites received CDS with CT recommendations and risks of ciTBI, for patients at very low risk of ciTBI and those not at very low risk. The primary outcome was the CT rate by site, controlling for time.

The study concluded that the implementation of TBI prediction rules was associated with modest, safe, but variable decreases in CT use.

Dayan PS, Ballard DW, Tham E, Hoffman JM, Swietlik M, Deakynne SJ, Alessandrini EA, Tzimenatos L, Bajaj L, Vinson DR, Mark DG, Offerman SR, Chettipally UK, Paterno MD, Schaeffer MH, Wang J, Casper TC, Goldberg HS, Grundmeier RW, Kuppermann N; Pediatric Emergency Care Applied Research Network (PECARN); Clinical Research on Emergency Services and Treatment (CREST) Network; Partners Healthcare; Traumatic Brain Injury- Knowledge Translation Study Group. Use of Traumatic Brain Injury Prediction Rules With Clinical Decision Support. *Pediatrics*. 2017 Mar 24. [Epub ahead of print]. PubMed PMID: 28341799.

## SUMMARY

**Reliability and Validity of a Two-Question Alcohol Screen in the Pediatric Emergency Department.**

This multisite study tested the reliability and validity of a two-question alcohol screen on adolescents that presented to 16 pediatric emergency departments. There were 4838, 12-17 year olds who completed a self-administered assessment of the 2-question alcohol screen and other measures of alcohol, drug use and risk behaviors. A week later, a subsample of 186 participants re-took the assessment, to assess the test-retest reliability. Results from this study found a moderate to good test-retest reliability and that a moderate or high risk had the best-combined sensitivity and specificity for determining alcohol use disorder among the participants.

Spirito A, Bromberg JR, Casper TC, Chun TH, Mello MJ, Dean JM, Linakis JG; Pediatric Emergency Care Applied Research Network. Reliability and Validity of a Two-Question Alcohol Screen in the Pediatric Emergency Department. *Pediatrics*. 2016 Dec;138(6). PubMed PMID: 27940674.

**Prevalence of Brain Injuries and Recurrence of Seizures in Children With Post-traumatic Seizures.**

**SUMMARY**

This study evaluated the frequency of traumatic brain injuries (TBIs) on computed tomography (CT) and short-term seizure recurrence in children with posttraumatic seizures (PTS).

The study evaluated children < 18 years with head trauma and PTS and assessed TBI on CT, neurosurgical interventions, and recurrent seizures within 1 week.

The study concluded that children with PTS have a high likelihood of TBI on CT, and those with TBI on CT frequently require neurosurgical interventions and frequently have recurrent seizures. Those without TBIs on CT, however, are at low risk of short-term recurrent seizures, and none required neurosurgical interventions. Therefore, if CT-negative and neurologically normal, patients with PTS may be safely considered for discharge from the ED.

Badawy MK, Dayan PS, Tunik MG, Nadel FM, Lillis KA, Miskin M, Borgialli DA, Bachman MC, Atabaki SM, Hoyle JD Jr, Holmes JF, Kuppermann N; Pediatric Emergency Care Applied Research Network (PECARN). Prevalence of Brain Injuries and Recurrence of Seizures in Children With Posttraumatic Seizures. *Acad Emerg Med.* 2017 May;24(5):595-605. Epub 2017 Apr 10. PubMed PMID: 28170143. ■



## PECARN New Faces & Nodal News

### CHaMP Node



**Dr. Matthew Hansen** is an Assistant Professor in the Department of Emergency Medicine at the Oregon Health and Science University. His research interests focus on resuscitation and stabilization of ill and injured children in the prehospital and ED settings. Dr. Hansen is particularly focused on pediatric airway and respiratory management in the prehospital setting.



**Dr. Kate Remick** is an Exec Lead for the EIIC/Lead for the Hospital Base and Collaborative domains. She is an Assistant Professor of Peds at Dell Medical School at the University of Texas-Austin and Med Director for San Marcos Hays County EMS System. Her focus is clinical quality/patient safety through provider education, development of evidence-based guidelines, and system-level readiness.

### GLEMSCRN Node

**Jessica Saunders**, MACPR, GLEMSCRN Nodal Administrator conducted a survey to RCs at all 18 sites. Her study, *Inclusion of the Joint Task Force Competency Domains in Onboarding Programs for Clinical Research Coordinators: Variations, Enablers, and Barriers* was presented at the Society of Clinical Research Associates (SOCRA) Conference in Montreal, QC where it was a finalist in the poster program. The results have been accepted for publication in the ACRP journal *Clinical Researcher*.

**Olivia-Marie Groves** joined the staff at Nationwide Children's Hospital as a RA in February 2017. She recently graduated from The Ohio State University with a bachelor's of science in Biology and a minor in Spanish. A lifelong resident of Columbus, Ohio, Olivia has always had a passion for two things: medicine and Ohio State Football.



**Ann Sobell** joined the RC team at the University of Michigan in June and will be the RC Champion for the Biosig II and MATIC projects. In May of 2017, Ann received her B.A. from Vanderbilt University with a double major in Medicine, Health & Society and Russian Studies. Ann plans on attending medical school and working in pediatric emergency medicine.



**Matt Postolowski** is a new RA at NCH. He is a recent Ohio State Graduate with a BS in Biology and intentions to attend medical school. Matt joined the team after volunteering as an undergraduate research assistant and is currently training for a half-marathon.



**Shelby Snodgrass** is a new RA at NWCH. She's from Greenfield, OH and recently moved to Columbus to begin her new career. She graduated from The Ohio State University with a BS in Zoology and she intends to work on obtaining her MPH in the near future.



**Nick Buhay** is a new RC for PECARN! He graduated from University of Michigan this past Spring with a BS in Neuroscience with pre-medical concentration. He plans on applying to medical school in the future, but is very excited to be working for PECARN at Michigan in the mean time!

### SW-Node



**Amy Pottenger** joined the University of New Mexico in June 2017 as a RC in Pediatric Emergency Medicine. Before moving to Albuquerque, she worked in pediatrics health services research and quality improvement at Indiana University. During that time she received her CCRP certification from SOCRA. In her free time she enjoys running, yoga, rock climbing, and going to concerts.

**Scott Oglesbee** just completed his MPH degree. He finished while working as the HEDA RC from NMHS. Scott will stay in his current role in the node. He's looking forward to actually enjoying vacations (instead of stay-cations), extra sleep, and spending more time with his family.

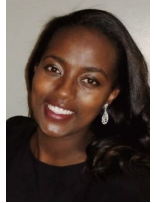


## WBCARN Node

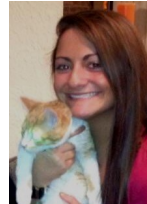


**Matthew Ledda** is a Clinical RA at CNMC. He grew up in the DC area and graduated from the Johns Hopkins University with a M.S. in Biotechnology. He's interested in working towards a career in medicine and aspires to work with medically underserved populations in the Philippines. He enjoys playing soccer and spending time with family.

**Beemnet Neway** is a Clinical RA at CNMC. She grew up in the D.C. area and graduated from Georgetown University with a B.S. in Human Science in May 2016. She is interested in global health and is pursuing a career in medicine to one day work in Ethiopia. In her free time, Beemnet loves to watch reruns of *The Office* or *Friends* on Netflix.



**Brittany McNamara** is from New Jersey, but went to college in D.C. and loved it so much that she stayed. She studied psych and early childhood education as an undergrad at The Catholic University of America. She's grateful for the opportunity to continue her research path at CNMC. She plans to pursue a Ph.D. in clinical child psych. She enjoys hiking, exploring the city, and taking pictures.

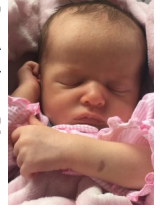


**Katie Lehnig** is originally from St. Louis (Go Cardinals!) and now lives in Chicago. She recently transitioned to the Clinical RC II in the Emergency Medicine Department. She received her undergrad in Business Administration at Missouri State University. She currently attends the University of Illinois at Chicago to pursue her MPH. She likes to stay active and is mom to the best cat ever, Frankie.



**Norma-Jean Simon, MPH, MPA** joined Lurie Children's Hospital as a clinical data analyst supporting the PECARN Registry and PED Screen studies in November 2016. Norma-Jean completed her undergraduate and graduate studies at the University of Wisconsin-Madison (Go Badgers!) and has since worked as research support staff in a variety of health topic areas including migrant health, newborn screening, health literacy, and obesity prevention. She enjoys hiking, bouldering, and checking out the latest exhibits at the Chicago Field Museum.

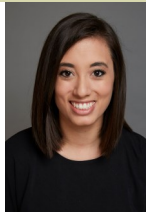
Introducing... **Isa Elizabeth Shreve-Jacobs**, born April 14, 2017.



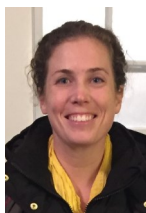
## DCC

**Melissa Metheney** has accepted the role of Assistant PECARN Director at the Utah Data Coordinating Center. She will be helping to oversee PECARN projects and will assist Sally Jo, Charlie, Mike, Larry and John with DCC related PECARN activities. Melissa has been associated with PECARN for several years, first as a PECARN RC at Nationwide Children's Hospital, then as a Project Manager at the DCC. She also directs another research network at the DCC. She has extensive experience in research and particularly PECARN and pediatric GI research.

Please feel free to contact Melissa with PECARN issues as appropriate.

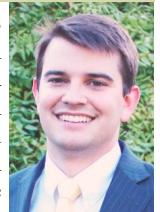


**Jessica Alvey** completed her Master's degree in statistics at BYU. She has been working as a biostatistician at the DCC for two years, and has worked on several other clinical research projects during that time. She enjoys hiking, practicing yoga, and trying new recipes.



**Hailey Ingebreetsen** recently completed her master's in statistics from the University of Utah in the Department of Educational Psychology. She will provide statistical support for PECARN.

**Michael Webb** earned a BS in Economics from Brigham Young University followed by an MS in Statistics from the University of Wyoming in 2017. His masters research focused on determining the pollution level of the Ashtabula River in Ohio by testing tumor prevalence in catfish. He started work as a biostatistician for the Data Coordinating Center at the University of Utah in June 2017. He is providing statistical support for several PECARN studies. Michael enjoys hiking, camping and spending time with his wife and two kids.



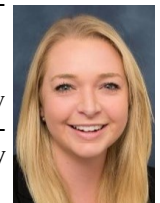
## PRIME Node



Congratulations **Emily Kim** on the birth of baby **Evolyn**, February 17<sup>th</sup>. Evolyn joins big sibs Ella and Oliver.

PRIME would like to bid a very fond farewell to many exceptional research coordinators. At Univ of Utah, **Dilon Stephens** left for Physical Therapy school. At CHOP, **Jason Marshall** and **Thomas Moore** both accepted new positions in cancer research (at Jefferson and Penn respectively). At UCD, **Michelle Nguyen** and **Justine Cortez** both left for nursing school (at UCSF and JHU respectively). We would also like to welcome **Reena Karki** (Research Manager) and **Jieun Hwang** (Research Coordinator) at Univ of Utah, and **Rebecca Kim** (Research Coordinator) at UC Davis. We offer our congratulations to **Nate Kuppermann**, whose lifetime achievements in mentorship were recognized by SAEM with a new award in his honor – the *Nathan Kuppermann Award for Mentorship in PEM Research*.

**Nicole Vestal** joins The Children's Hospital of Philadelphia as a new research coordinator. She graduated from UCLA with a Bachelor's of Science in Anthropology. She enjoys yoga and exploring all of the history Philly has to offer in her spare time.



## PEM-News Node

We greatly thank **Ms. Anita Patel** for her five years of outstanding work for PECARN as a research coordinator, nodal administrator and co-Chair of the Feasibility and Budget Subcommittee. Her mix of intellect, organizational skill, consistent hard work and sense of responsibility will be greatly missed by PEM-NEWS and PECARN. ■