



**FALL  
2018**

## **“So, We Did Some Research - Now What?”**

by Rachel Stanley, MD, MHSA,  
PECARN Nodal Principal Investigator

# **PECARN**

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**PEDIATRIC EMERGENCY CARE  
APPLIED RESEARCH NETWORK**

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## “So, We Did Some Research - Now What?”

by Rachel Stanley, MD, MHSA, PECARN Nodal Principal Investigator (GLEMSCRN Node)

Findings from research creates evidence to drive higher quality medical practice. When evidence is incorporated into clinical practice and guidelines of care, the uptake of that evidence will be accelerated. While dissemination of results is part of the research process, the difficulty of successful transfer of research knowledge should not be underestimated. Passive uptake of evidence through publication, in traditional medical journals, can take 13-17 years. As such, we recognize the importance of early active dissemination of PECARN research findings. In Pediatric Emergency Medicine (PEM), establishing evidence-based guidelines is difficult and disseminating them to a wide audience may be even harder.

After 17 years, the Pediatric Emergency Care Applied Research Network (PECARN) has demonstrated its significant contribution to the care of acutely ill and injured children through the successful completion of over 35 research studies and over 140 publications in journals. Despite the importance the numerous publications in medical journals, the information is not easily

accessible to parents, families or non-research medical providers. Reaching non-researchers and general emergency providers is particularly important as most children seek emergency care in general EDs (i.e. non-specialized pediatric ED settings). While the uptake of new knowledge is relatively good in pediatric academic centers, uptake in general EDs is more limited. Estimates are that up to 40% of children do not receive treatments for which clear evidence exists, and up to 20% may receive treatments that are of no benefit or potentially even harmful.

### Has PECARN made a difference?

PECARN has demonstrated success in translating research results into practice by impacting practice guidelines. Examples include treatment for bronchiolitis and head injury for children. The first randomized controlled trial (RCT) completed in the Network evaluated the effectiveness of oral dexamethasone for acute moderate to severe bronchiolitis in children seen in the ED, both with regard to the need for hospitalization (primary outcome), and severity and duration of disease

(secondary outcomes). The investigators determined that there was no reduction in hospitalizations or improvement in respiratory scores associated with the administration of oral dexamethasone. Subsequently, the AAP published guidelines for the treatment of bronchiolitis in infants citing this research. This is one way to accelerate the uptake of research results. In this example, PECARN's first clinical trial impacted the clinical care guidelines.

To address priorities around injury and prediction rules, the Network conducted a prospective study of children with minor-to-moderate blunt head trauma. The purpose was to identify children at very low risk of clinically-important traumatic brain injuries (TBI) for whom CT might be unnecessary. The network successfully enrolled 34,000 patients for the derivation of two clinical decision rules (one for children < 2 years and one for children > 2 years), and an additional 9,000 patients to validate the decision rules. These validated prediction rules identified children at very low risk of clinically important TBIs for





whom CT can routinely be obviated. The impact of this study has been far reaching, and the results of this work has been included in many national guidelines.

The success of the head injury decision rule led to further study in this area with studies on decision rules for abdominal trauma and cervical spine injury. Although PECARN has published widely and the results have been incorporated into national guidelines, the dissemination and knowledge translation of our findings is a challenge and an area for future growth.

Translation of research results is a continual challenge. To meet this challenge, the Network is focused on increasing dissemination and translation of research findings in several ways. We are actively working with the Emergency Medical Services for Children (EMSC) program to disseminate research findings to EMSC partners, professional organizations and the public. Dissemination to these groups is accomplished primarily by

presentation of findings at national meetings, publications and a website summarizing research projects and outcomes. This helps extend the knowledge reach additional people.

To enhance the distribution of research findings and evidence based guidelines to the full spectrum of emergency medicine providers and parents, we continuously seek novel ways to disseminate this knowledge. In addition to the standard publication and presentation dissemination to other medical professionals, our network collaborates with the EMSC Innovation and Improvement Center (EIIC) to disseminate findings through quality improvement education and quality improvement collaborative efforts.

PECARN is also actively working with a dissemination working group whose main focus is finding ways to distribute EMSC research to the public, EMSC stakeholders, child health advocates, and the scientific community. It is crucial for us to continue to seek optimum ways to communicate

with our EMSC stakeholders. Social media is a measurable outlet where we can track the reach of our posts to ensure they are delivered to our target audience.

PECARN has paved a substantial pathway toward conducting multi-center pediatric emergency research. The network also successfully developed and implemented a broad research agenda and executes observational studies and clinical trials to definitively answer key research questions in pediatric emergency care. PECARN investigators successfully leverage the MCHB/HRSA/EMSC funding to obtain extramural grants from Federal agencies, and publish extensively on evidence-based practice derived from PECARN research projects. The next frontier for PECARN is to continue the translation of important research findings into everyday PEM practice so every child who seeks emergency care in the US in large or small EDs can be treated with evidence-based medicine.

## PECARN Study Updates

### **ESETT**

Thank you all for your efforts in finding patients with seizures refractory to benzodiazepines. After a slow summer, enrollment kicked in again, with 3 enrollments in 2 weeks. We are now at 454 total patients. The interim analysis occurs at 450.

### **Probiotics**

Follow-up for the Probiotics study completed on August 31, 2018! With enrollment and follow-up finished, we continue to work on the manuscripts for the study, four of which are in various stages of development. Meanwhile, the main manuscript has been submitted at a major medical journal. We appreciate everyone's hard work and dedication to this study!

### **FLUID**

The FLUID study successfully enrolled approximately 1,400 children with DKA and 400 non-DKA patients over five+ years at 13 PECARN centers. We previously published the Methods paper and an ancillary paper on circulating inflammatory markers in this condition. In June, we published the results of the main analysis in the New England Journal of Medicine! We are now deep into secondary analysis and manuscript writing. We have submitted an ancillary study for publication pertaining to predictors of successful enrollment. The DKA versus non-DKA manuscript is nearing completion. Two other major manuscripts underway and soon to follow: 1) Predictors of Pyuria and Kidney Injury in DKA, and 2) Hemodynamics and Neurocognitive outcomes. The manuscript

analysis plans have been helpful to continue moving forward each manuscript as the previous is completed.

DKA is the leading cause of death in children with Type 1 diabetes. This study and the resulting manuscripts will allow us to treat children with DKA more appropriately, and in an evidence-based fashion. This will likely lead to improved outcomes. We are also uncovering other possible causes of brain and kidney injury in children with DKA.

### **ASSESS**

Currently, ASSESS investigators have 3 manuscripts under review (Predictive Validity, NIAAA Screen to Other Drug Use, Risky Behavior in Latino Youth); 1 manuscript to be resubmitted (Risky Adolescent Behavior); 1 manuscript in GAPS review (Con-

current and Predictive Validity of Newton Screen); 3 in preparation (Risky Sexual Behavior in Teens, CRAFT screening, Racial and Ethnic Differences of NIAAA screen) and a number of manuscripts which we will begin this Fall.

### **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/studyData-sets/StudyDetails?studID=2>.

## **APPEND-X**

The goal of this non-blinded intention-to-treat RCT is to compare the safety of non-operative management of uncomplicated appendicitis in children aged 5 to 18 years compared with urgent appendectomy. Non-operative management could provide a safer, more cost-effective treatment option for children with appendicitis. This study received funding from the NIDDK for one year under a U34 planning grant. With this, we have been working on creating the study worksheets, database, Manual of Operations, and preparing for using a CIRB. The U01 grant application was submitted for the February 2018 grant cycle.

## **PED SCREEN**

This project addresses the 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 end goal of improving the detection and treatment of pediatric sepsis in the emergency department (ED). To accomplish this, we will automate the determination of organ dysfunction in children with sepsis directly from structured and narrative data in an expanded multi-center EHR patient registry. That data will be used to derive and validate a prediction model of pediatric sepsis that predicts subsequent organ dysfunction within 48 hours using ED EHR data from the first 4 hours of care. Innovative deliverables from this project include the existence of a rich EHR registry, an automated process of outcome determination, and a prediction model of risk of sepsis.

## **Biosignatures I & II**

The main goal of this study is to assess the stability of the "RNA Biosignature" to distinguish viral and bacterial infections through obtaining sequential blood samples for RNA expression analysis on febrile infants  $\leq 60$  days old. Enrollment in the Biosig II study remains on target. We have started an ancillary study exploring the gut microbiome through stool samples and correlating this bacterial growth with blood pathogens. We have also completed several manuscript analysis requests for Biosig II.

A few more Biosig I manuscripts have recently come to publication/acceptance. The Viral/SBI co-infection manuscript was accepted at the Journal of Pediatrics and the Infant Pneumonia study was accepted at Pediatric Emergency Care. Finally, the Variation in Care manuscript and the SBI Prediction Rule manuscripts are under review at other medical journals.

This study will allow us to identify young febrile infants at risk for SBI with greater accuracy and timelines. We will be able to treat and hospitalize those at risk with greater efficiency, and avoid invasive procedures, empirical antibiotics and hospitalization for those not at risk.

## **ED-STARs**

Study 2 launched July 24, 2017 and all 15 PECARN sites are enrolling. We are nearing the end of recruitment, and we will reach our target enrollment of 4,000. As of September 4, 2018, 12,156 subjects were screened and 3,717 have been enrolled. In addition, the University of Michigan Survey Research Center continues with the 3 month follow-up interviews. The 24-Hour Warning Signs study began enrolling on February 9 and there are 653 enrollments as of September 1st. Several manuscripts are currently being developed using Study 1 data. We appreciate all of the hard work everyone has put into this project!

## **PROMPT BOLUS**

Sepsis affects 75,000 children each year. Septic shock is the most severe form with cardiovascular and metabolic dysfunction. This study seeks to simultaneously confirm (or refute) the benefits of balanced fluids (Plasmalyte or Lactated Ringer's solutions) over normal saline recently demonstrated in critically ill adults, and to extend (or limit) the generalizability from adults to children. If the hypothesis is confirmed, a paradigm shift in the use of lactated ringers will yield maximal benefits since current practice relies almost exclusively on normal saline in the pediatric ED. Findings from this study have the potential to save hundreds of children's lives every year in the U.S. A CHOP pilot study is nearing completion; the full grant will be submitted in February 2019. We are also discussing a research partnership for this study with the PREDICT PEM research network in Australia and New Zealand.

## **REDUCE Working Group**

The PECARN Identifying, Understanding, and Reducing Racial and Ethnic Disparities in Pediatric Emergency Department Care (REDUCE) Working Group is striving to develop interventions to achieve health equity for all children cared for in the emergency department (ED) setting. As the first phase of this work, we have received NIH funding to identify racial/ethnic disparities in the management of pain for children presenting with long bone fractures or diagnosed with appendicitis using the PECARN Registry. This work will inform the development of interventions to reduce inequities in the provision of care for children presenting to the ED.

## **PECARN REGISTRY**

The PECARN Registry is an emergency care visit registry from EHR data for pediatric patients. The PECARN Registry currently contains data from all ED visits for calendar years 2012-2018. Each site transmits data to the DCC four weeks after completion of the calendar month to allow for maturation of the data. Automated data rules assess quality and validation of data. The PECARN Registry Expansion project has completed on-boarding two additional sites. We are bringing in the next three additional sites, bringing the total to nine PECARN sites.

The PECARN Registry is used to populate stakeholder endorsed pediatric emergency medicine quality of care performance measures and has met achievable benchmarks for each of the measures. Each month we successfully distribute over 475 provider and site report cards.

## **TIC TOC**

The Traumatic Injury Clinical Trial Evaluating Tranexamic Acid (TXA) in Children (TIC-TOC) is a pilot and feasibility trial of TXA for severely injured children being conducted at four PECARN sites. TXA has the potential to safely reduce blood transfusions, morbidity, and mortality in injured children. After enrollment was open for 3 months, the FDA approved the use of Exception from Informed Consent (EFIC) procedures. Enrollment is on hold while we complete community consultations and public disclosures and obtain central IRB approval using EFIC procedures. We're working on manuscript writing plans for the main and secondary papers.

## **Arginine**

Three manuscripts are currently in development ("Pediatric Emergency Department Use of Intranasal Fentanyl to Treat Pain in Children with Sickle Cell Disease and Its Impact on Discharge Rates: A Multicenter Perspective", "Pediatric ED Adherence to the 2014 NHLBI Guidelines Targeting Analgesic Therapy in the Management of Vaso-Occlusive Pain Episodes in Children with Sickle Cell Disease: A Multicenter Perspective", and "Normal Saline Bolus Use is Associated with Worse Pain Outcomes in Children with Sickle Cell Disease and Vaso-occlusive Pain Episodes: An International, Multicenter Experience") while the lead study team also works on preparing the phase III clinical trial grant for submission as a UG3/UH3 to NHLBI in October 2018. NHLBI has approved the  $> \$500k$ /year cap. This phase II trial will enroll approximately 360 patients across 10 PECARN sites.

# PECARN Health Outcomes

The mission of the EMSC Program was defined by Congress in its authorizing legislation, establishing a federal effort to expand and improve emergency medical services for children who need treatment for trauma or critical illness. Success of the program requires accountability to a variety of national, state and local stakeholders, demonstrating how the full EMSC program portfolio works together to achieve measurable progress toward this mission. Many questions arise when working toward this accountability: How do we define success? What is an “EMS improvement”? How do we know when an improvement has been identified? What is the best way to spread an improvement, once we know what optimal systems and clinical practice looks like in the pre-hospital and hospital settings?

The EMSC Program currently has two primary points of focus to answer those questions:

- 1) Building and synthesizing evidence to define optimal clinical care and ED and EMS systems that leads to improved pediatric survival and health outcomes after trauma or a medical emergency. PECARN plays a critical role by studying and defining optimal clinical care. Some examples:
  - o RNA biosignatures brought to the point-of-care in clinical practice, may identify young febrile infants who need early treatment and hospitalization, yet avoid unnecessary invasive testing, over-treatment with antibiotics and unnecessary hospitalizations in those who do not require such interventions.
  - o Clinicians may individualize fluid hydration for children with DKA to meet the clinical needs of individual patients without fear of causing brain injury. This may prevent cognitive impairment and decrease the risk of other complications in children with diabetes and DKA.
- 2) Engaging systems and providers to spread uptake of these system and clinical improvements. PECARN can also play a role here by studying the best methods for translating those findings into care settings. The newly funded C-Spine study includes a knowledge translation component. Investigators will engage clinical end-users in activities that will inform the design process thus ensuring that the Pediatric Cervical Spine Injury Risk Assessment Tool will be implementation ready.

While it is clear that PECARN contributes significantly to the EMSC Program mission, the challenge can come from articulating this impact and how PECARN improves health outcomes. Each PECARN study is an opportunity to test whether a specific clinical intervention will or will not result in improved health status among the study population. Sometimes, PECARN studies establish evidence that a specific clinical management is optimal. Other times, results can show that a particular clinical intervention is not significantly associated with improved survival or health outcomes. Both results are meaningful and work to answer the question “What is an improvement in pediatric emergency medical care?”

PECARN’s critical role can be maximized when the network’s power is used to explore research questions that reveal clear insights on optimal pediatric emergency medicine, as well as demonstrate successful paths for spreading the delivery of that optimal care.

- Erin Reiney, Acting Division Director, Division of Child, Adolescent and Family Health, Maternal & Child Health Bureau (MCHB), Health Resources & Services Administration (HRSA)
- Diane Pilkey, Nurse Consultant in MCHB and HRSA Project Officer for PECARN

***“What is an improvement in pediatric emergency medical care?”***



# Federal Corner

## ***New Guidelines for Care of Children in the ED***

The 2009 Joint Policy Statement “Guidelines for Care of Children in the Emergency Department” has been revised with an anticipated simultaneous publication in early November 2018 by the American Academy of Pediatrics (AAP), the American College of Emergency Physicians (ACEP) and the Emergency Nurses Association (ENA). The National Pediatric Readiness Toolkit, assessment portal, and other pediatric readiness activities (e.g. the Pediatric Readiness Quality Collaborative) remain available to support and encourage pediatric readiness efforts. In collaboration with AAP, ACEP, and ENA, the EMS for Children Program is planning a national pediatric readiness reassessment of emergency departments in late 2019. It is expected that the National Pediatric Readiness Assessment Portal, hosted by the National EMS for Children Data Analysis Resource Center (NEDARC), will close at the end of 2018 in preparation for this national reassessment.

## ***Pediatric Readiness Quality Collaborative (PRQC)***

All 146 emergency departments participating in the EMSC PRQC are preparing to launch local quality improvement efforts to improve pediatric readiness in each participating ED. Working with 17 teams consisting of 19 training sites and 127 affiliate sites across 17 states, the collaborative team has provided participants with resources, tools, quality improvement education, strategies, and metrics to help support local efforts. The collaborative teams are geographically spread across the United States and include hospitals in each of the following states: AK, CA, CT, GA, IL, IN, MO, KS, NJ, NY, OR, RI, TN,

TX, VT, WA, and WI. The participating sites will be working on any of four interventions based on gaps identified during the 2013 National Pediatric Readiness Assessment:

1. Weighing and recording pediatric weights in kilograms;
2. Identification of abnormal vital signs;
3. Optimizing pediatric inter-facility transfers; and
4. Ensuring pediatric-specific needs are integrated into the hospital disaster plan



## ***Trans-NIH Pediatric Research Consortium:***

In June, the National Institutes of Health (NIH) announced the formation of a consortium among 27 institutes and centers to fund child health research, termed the Trans-NIH Pediatric Research Consortium. The lead NIH institute for the consortium will be the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) under the directorship of Diana Bianchi, MD. (<https://www.nih.gov/news-events/news-releases/new-trans-nih-consortium-aims-advance-pediatric-research-global-level>)

## ***Opioid Misuse & Abuse:***

The National Highway Traffic Safety Administration (NHTSA) Office of EMS has awarded a Cooperative Agreement to the National Association of State EMS Officials (NASEMSO), in partnership with the ACEP and the National Association of EMS Physicians. The goal of this agreement is to develop an evidence-based guideline for prehospital treatment of suspected opioid overdose. This guideline will include recommendations for both

patient care and provider safety and will focus upon the optimal routes of administration, titration of doses to clinical effect, and triage protocols for destination hospitals. The project has an actively involved Technical Expert Panel that is providing guidance on developing recommendations in response to the project's key questions. The project is scheduled for completion in March of 2019. This reflects NHTSA's involvement in a number of public health initiatives that impact prehospital and hospital-based care. Numerous webinars hosted by NHTSA are available online. (<https://www.ems.gov/emsdata.html>)



## ***Field Triage Guidelines:***

NHTSA's Office of EMS is planning a revision of the Field Triage Guidelines. In support of this, two literature syntheses have been conducted by the Agency for Healthcare Research and Quality's (AHRQ) Evidence-based Practice Center Program. The first of these reviews, examining level of consciousness as a predictor of the need for tertiary trauma care has been completed and posted on the AHRQ website ([https://effectivehealthcare.ahrq.gov/sites/default/files/related\\_files/field-triage-glasgow\\_executive.pdf](https://effectivehealthcare.ahrq.gov/sites/default/files/related_files/field-triage-glasgow_executive.pdf)). This document reviews the advantages and disadvantages of different measures to assess mental status, including the Glasgow Coma Scale, the modified GCS, and the Simplified Motor Score. The second review on vital sign parameters to identify children at high risk of serious injury and guide triage destination decisions respiratory and circulatory system predictors was published in April ([https://effectivehealthcare.ahrq.gov/sites/default/files/pdf/predictors-trauma-care\\_cer](https://effectivehealthcare.ahrq.gov/sites/default/files/pdf/predictors-trauma-care_cer)



[205.pdf](#)). The authors concluded that a combination of physiologic measures with assessments of mental status likely performs better than use of either parameter in isolation. In addition, NHTSA's Office of EMS has awarded a Task Order to procure and analyze linked state EMS-trauma databases to identify other predictors of severe injury in the absence of physiologic derangement. That project is expected to be completed in September.



### **EMS Agenda 2050:**

The EMS Agenda 2050, coordinated by NHTSA, the HRSA EMSC program, the Office of the Assistant Secretary for Preparedness and Response at the Department of Health and Human Services (HHS), and the Department of Homeland Security Office of Health Affairs, will be rolled out on September 20, 2018. The roll-out will be announced at the National Implementation Forum in Washington, DC. This 2-year project has sought feedback from EMS community members to establish a written agenda on the EMS trajectory for the next 30 years. The project has been a collaboration between pre-hospital providers, hospital-based providers, and several professional organizations, including the AAP,

ACEP, the ENA, and the National Associations of EMS Educators & EMS Physicians. (<http://emsagenda2050.org/about-the-project/>)

### **Critical Crossroads Dissemination Meeting**

As part of the HHS/ HRSA commitment to address the urgent mental health concerns and serious mental illness, HRSA launched an agency-wide effort to identify innovative and collaborative strategies to address this public health issue in new, impactful ways. This prompted a collaboration led by the HRSA EMSC Program, in partnership with the Federal Office of Rural Health Policy (FORHP). Together, EMSC and FORHP examined the rising number of children seen in EDs experiencing a mental health crisis, the gaps in hospital preparedness to provide continuity of care for these patients, and the impact on children and their families. This resulted in the launch of the Critical Crossroads: Improving Emergency Care for Children in Mental Health Crisis project in late 2017.

To date, EMSC has led a cross-governmental approach that has fostered federal partnerships and stakeholder engagement dedicated to the mission of improving emergency care for children in mental health crisis, resulting in the centralization of resources into a Critical Crossroads Care Pathway Toolkit. The toolkit is intended to help improve the coordination and

continuity of care of children in emergency mental health crisis. It is intended to provide helpful resources to support customized care pathways, and serve as a piece in the larger web of addressing an aspect of care for children's mental health needs. There will be a November 13th, 2018 meeting in Rockville to plan dissemination of the toolkit and a national launch is projected in early 2019.

### **Databases & Data Sharing:**

The Office of the National Coordinator for Health Information Technology is working on how to more seamlessly integrate EMS data into hospital-based electronic health records to facilitate care. This project evaluates data integration in five communities in California using a model termed the EMS Search, Alert, File and Reconcile (SAFR) model. ([https://www.healthit.gov/sites/default/files/emr\\_safer\\_knowledge\\_product\\_final.pdf](https://www.healthit.gov/sites/default/files/emr_safer_knowledge_product_final.pdf))



The 2016 National EMS Information System (NEMSIS) public release research dataset is now available and includes almost 30 million EMS activations submitted by approximately 10,000 EMS agencies. (<https://nemsis.org/using-ems-data/request-research-data/>)



## **Upcoming Events**

- American College of Emergency Physicians: **October 1-4, 2018**, San Diego, CA
- National EMSC Data Analysis Resource Center (NEDARC) Workshop on Using Performance Measure Data to Make Impactful Change: **October 16-18, 2018**, Philadelphia, PA
- American Academy of Pediatrics: **November 26, 2018**, Orlando, FL
- National EMSC Data Analysis Resource Center (NEDARC) Workshop on Using Pediatric NEMSIS Data to Drive Quality Improvement: **February 26-28, 2019**, San Diego, CA
- Pediatric Academic Societies: **April 24-May 1, 2019**, Baltimore, MD
- National Association of State EMS Officials: **May 13-16, 2019**, Salt Lake City, UT
- Society for Academic Emergency Medicine: **May 14-17, 2019**, Las Vegas, NV



# Summaries of Recent PECARN Publications

## PECARN Registry

### SUMMARY

The Pediatric Emergency Care Applied Research Network (PECARN) Registry, representing four hospital systems and seven emergency departments (EDs), demonstrates that ED data from disparate health systems and EHR vendors can be harmonized for use in a single registry with a common data model. The current PECARN Registry represents data from 2,019,461 pediatric ED visits, 894,503 distinct patients, more than 12.5 million narrative reports, and 12,469,754 laboratory tests and continues to accrue data monthly. The Registry is a robust harmonized clinical registry that includes data from diverse patients, sites, and EHR vendors derived via data extraction, de-identification, and secure submission to a central data coordinating center. The data provided may be used for benchmarking, clinical quality improvement, and comparative effectiveness research.

Deakyné Davis S, Grundmeier RW, Campos DA, Hayes KL, Bell J, Alessandrini EA, Bajaj, L, Chamberlain JM, Gorelick MH, Enriquez R, Casper TC, Scheid B, Kittick M, Dean JM, Alpern ER and the Pediatric Emergency Care Applied Research Network. The Pediatric Emergency Care Applied Research Network Registry: A Multicenter Electronic Health Record Registry of Pediatric Emergency Care. *Appl Clin Inform.* 2018 Apr;9(2):366-376. doi: 10.1055/s-0038-1651496. Epub 2018 May 23. PMID: 29791930

## FLUID Rates for DKA

### SUMMARY

This multi-center, randomized, controlled trial evaluated the effects of rehydration rate and fluid sodium content on neuro-cognitive outcomes in children with diabetic ketoacidosis (DKA). The study examined 1,389 episodes of DKA in 1,255 children enrolled from 13 PECARN EDs. Participants were randomized using a 2 x 2 factorial design to one of four treatment regimens, consisting of slow or fast rates of rehydration using 0.45% or 0.9% sodium chloride fluid. The primary trial outcome was decline in mental status, as measured by Glasgow Coma Scale scores. Secondary outcomes included short-term memory and brain injury status during DKA treatment, and memory and IQ status 2 to 6 months after DKA treatment. The study concluded that neither the rate of administration nor the sodium chloride content of the intravenous fluid significantly influence neurological outcomes in children with DKA.

Kuppermann N, Ghetti S, Schunk JE, Stoner MJ, Rewers A, McManemy JK, Myers SR, Nigrovic LE, Garro A, Brown KM, Quayle KS, Trainor JL, Tzimenato, L, Bennett JE, DePiero AD, Kwok MY, Perry CS III, Olsen CS, Casper CT, Dean MJ, Glaser NS, for the PECARN DKA Fluid Study Group. Clinical Trial of Fluid Infusion Rates for Pediatric Diabetic Ketoacidosis. *N Engl J Med* 2018 378:2275-2287. DOI:10.1056/NEJMoa1716816

## Secondary Analysis of THAPCA Data

### SUMMARY

This study treated 292 pediatric patients older than 48 hours and younger than 18 years in 36 pediatric ICUs during 2009-2012. Participants underwent therapeutic hypothermia vs therapeutic normothermia for 48 hours. The study aimed to determine whether post-cardiac hypotension in children and adolescents after resuscitation is associated with survival to hospital discharge. The study concluded that early post-cardiac arrest hypotension participants were less likely to survive to hospital discharge, even after adjusting for covariates of interest.

Topjian AA, Telford R, Holubkov R, Nadkarni VM, Berg RA, Dean JM, Moler FW; Therapeutic Hypothermia After Pediatric Cardiac Arrest (THAPCA) Trial Investigators. Association of Early Postresuscitation Hypotension With Survival to Discharge After Targeted Temperature Management for Pediatric Out-of-Hospital Cardiac Arrest: Secondary Analysis of a Randomized Clinical Trial. *JAMA Pediatr.* 2018 Feb 1;172(2):143-153. doi: 10.1001/jamapediatrics.2017.4043. PubMed PMID: 29228147

## Interobserver Agreement in Pediatric Cervical Spine Injury Assessment

### SUMMARY

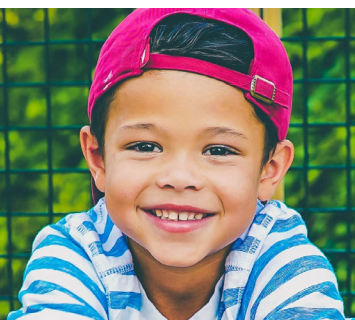
This four-site, prospective cohort study evaluated children < 18 years transported by EMS to pediatric EDs for evaluation of CSI after blunt trauma with the objective to determine the interobserver agreement between EMS and emergency department (ED) providers for cervical spine injury (CSI) risk assessment variables and overall gestalt. The study examined 1,372 paired observations for 29 variables. The primary trial outcome was the level of interobserver agreement between EMS and ED providers in their risk assessment of CSI. All variables achieved moderate to better agreement including eight variables previously shown to be independently associated with CSI in children: diving mechanism, high-risk motor vehicle collision, altered mental status, focal neurological findings, neck pain, torticollis, substantial torso injury, and predisposing medical condition. The study concluded that emergency medical services and ED providers achieved at least moderate agreement in the assessment of CSI risk factors in children after blunt trauma which supports the development of a pediatric CSI risk assessment tool for EMS and ED providers to reduce interventions for those children at very low risk for CSI while still identifying children with injury.

Browne LR, Schwartz H, Ahmad FA, Wallendorf M, Kuppermann N, Lerner EB, Leonard JC. Interobserver Agreement in Pediatric Cervical Spine Injury Assessment Between Prehospital and Emergency Department Providers. *Acad Emerg Med.* 2017 Dec;24(12):1501-1510. doi: 10.1111/acem.13312. Epub 2017 Nov 2. PubMed PMID: 28921731.





# “ CONDUCTING HIGH PRIORITY, HIGH-QUALITY RESEARCH IN PEDIATRIC EMERGENCY CARE ”



## NEW FACES & NODAL NEWS

### DCC Node

**Brad Barney** is the newest biostatistician at the DCC. Brad received his Ph.D. in Statistics at Texas A & M University, and was a faculty member at Kennesaw State University and more recently at BYU. Brad has clinical research experience, including work at the Cleveland Clinic and the M.D. Anderson Cancer Center.

**Michelle Wilcox** is the newest member of the DCC's admin support team and will be assisting PECARN. She's recently worked as a Paraeducator, an Executive Secretary, and a Pediatric Residency Coordinator.

**Adrianne Neiss** joined PECARN in April 2018. She has a PhD in Biochemistry from Trinity College, a MS in Graphic Design from the Univ. of Mass. Lowell, and a MS in Life Sciences from Univ. Maryland College Park.

The DCC wishes **Amy Watson** farewell. It has been an honor working with such a wonderful colleague over the years. We'd like to thank her for her help and kindness and wish her continued success wherever life may take her.



### WBCARN Node

**David Lewander** joined the Boston Children's PECARN research team in May of 2018. He graduated George Washington University with a B.S. in Public Health in 2016, where he concentrated his studies in urban health and global health policy. He will be applying to medical school in 2019 in hopes of pursuing a future in pediatric emergency medicine.

**Ar'Reon Watson**, new RA at CNMC, recently graduated with a Bachelor's in Psychology and Law from Kenyon College in Ohio. He's originally from Saint Louis, MO. He plans to obtain a Ph.D. in clinical/forensic psychology.

**Ryan Pearman** is a Research Assistant in the Children's National Emergency Department. He holds a BA in Psychology from the University of Southern California. His future goals include attending medical school.

**Amanda Barkho**, new RC at Lurie Children's Hospital, attended the DePaul University Bachelor of Arts and Sciences (BAS) program where she majored in Psychology with

concentration in Research Methods, Community Psych and Human Development and a minor in Sociology.

**Dr. James Chamberlain** (WB-CARN PI) was honored by the Society for Academic Emergency Medicine (SAEM) in March of this year with the Nathan Kuppermann Award for Mentorship in Pediatric Emergency Medicine Research. Congratulations, Jim!!

In April, 2018-Dr. Chamberlain, MD established the Center for Data Analytics and Informatics in the Division of Emergency Medicine at Children's National and became its Founding Director. Their mission is to develop a robust informatics infrastructure to support research as well as quality improvement initiatives in the Division of Emergency Medicine. The establishment of the Center builds on Dr. Chamberlain's work as one of the lead investigators in the development of PECARN Core Development Project (PCDP) and PECARN Registry and recognizes the potential of capitalizing on EHR data to improve patient care.

### SW Node



SW Node welcomes EMSA RC in Tucson, Arizona, **Jeff Tolson**. Jeff graduated from the University of Arizona in May 2018 with a degree in Biomedicine and Biochemistry. After volunteering with the University of Arizona

Emergency Medical Services for three years, he joined the research team with the Department of Emergency Medicine. Jeff loves to travel, especially to Italy. His favorite restaurant is The French Laundry by Thomas Keller and his favorite food is pizza.





UC Davis says farewell to **Cindy Valencia** who is off to pursue a PhD in Public Health Sciences, but happily welcomes **Maria Marois** as the new PRIME Nodal Administrator! Maria has an outstanding background and experience, and we know she will be a great addition to PRIME.



We also have several outstanding new RCs coming on board.



**Amia Andrade**, Assistant RC, started in August and will take over several of Rebecca Kim's projects while she is on maternity leave.



**GLEMSCRN Node**

Publications/special presentations: **Saunders, J, Stanley R, Zuspan S, Pimenta K, Berent R, Gonzalez V, Herzog N, Robinson V, Thomas B, Jones, C.** Recommendations for Best Onboarding Research Coordinator Practices in Clinical Research using the Joint Task Force Competency Domains as a Framework. Research Practitioner. Published June Issue.

**William Bryant** graduated from the Ohio State University in 2017 with a B.S in Neuroscience. He plans to become a clinical psychologist and conduct research in early childhood developmental disorders.



**Maria** worked for many years coordinating several occupational and environmental health studies. Prior to joining PECARN, she served as research manager for the Personalized Research for Monitoring Pain Treatment clinical trial. She holds a PhD in epidemiology from UC Davis and received her MPH with an emphasis in health promotion from San Diego State University.

**Amia** recently graduated from Loma Linda University (LLU) with her MPH in Research Epidemiology. She is also an alumna of UC Davis (UCD) with a Bachelor's of Science in Cell Biology, and a Bachelor's of Arts in Psychology.

Children's Hospital of Philadelphia and the CHOP ED welcomes three new RCs- **Ima Samba, Casey Swan** and **Peter McBride!**

**Ima** graduated from Northwestern

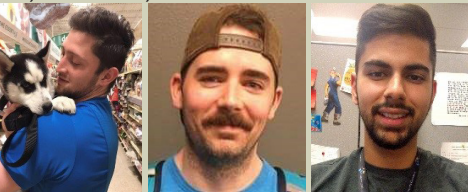
**Andres Cuesta** was born in Colombia and came to the U.S. to attend college and play soccer on a scholarship.

**Molly McNamara** graduated from Ohio State in May 2018 with a BS in Biomedical Science.

**Chris Korth** graduated from Ohio University with a degree in Human Biology. He has been trained as an EMT, a scribe, and a ninja.

**Preet Dhanoa** is a recent graduate from Ohio State University, where he acquired a Bachelor's of Science in Pharmaceutical Sciences.

**Noelle Herzog**, HEDA RC, University of Michigan, presented the poster "Standardizing Informed Consent Training for a Multi-Center, National Research Network in the ED" at the UM Barsan Research Forum, Ann Arbor, MI and the Ped Academic Societies Meeting, Toronto, Canada, 2018.



University in June 2017, where she pursued both religious studies and biological sciences. She's interested in autoimmune diseases in women and aspires to become a rheumatologist.

**Casey** is pursuing a career in medicine in hopes of working with underserved populations. She holds a Masters in education from the University of Pennsylvania and a double major in Music and Italian Studies from the College of William & Mary.



**Peter** graduated from the University of Connecticut with a Bachelor's of Science in Electrical Engineering and hopes to become a Physician Assistant.



Stay tuned for pictures of baby boy Kim!

**Anjali Doshi** recently graduated from The Ohio State University with a BS in Biomedical Science and is currently applying to medical school.

Mountains Climbed: **Prashant Mahajan** (in blue), his wife Jayashree (in red) and brother Arun (in green), climbed Kilimanjaro in July.

Degrees or honors: **Rose Azrak**, MBA **Daniel Cohen**, Assistant Dean for Community Medical Education, The Ohio State University, Columbus, Ohio

**HOMERUN Node**

**Dr. Quayle** is a graduate of Washington University School of Medicine. She completed her residency at St. Louis Children's Hospital, and her fellowship in Pediatric Emergency Medicine at Washington University School of Medicine. She serves as Division Chief as the Dana Brown Chair in Pediatric Emergency Medicine since 2017. She also oversees clinical care as the Medical Director for St. Louis Children's Hospital ED.

