Background and Objectives: Despite advances in pediatric resuscitation, survival and neurological outcomes after return of spontaneous circulation (ROSC) remain variable. While differences between in-hospital and out-of-hospital cardiac arrests are well described, the impact of emergency department (ED) trauma designation on post-ROSC stabilization and short-term outcomes is unknown. Trauma centers may offer greater access to critical care resources and coordinated resuscitation, potentially improving outcomes for children with non-traumatic cardiac arrest. This study compared physiologic stabilization, seven-day survival, and neurological outcomes among pediatric patients achieving ROSC after non-traumatic cardiac arrest treated at trauma-designated versus non-trauma pediatric EDs.

Methods: We conducted a retrospective cross-sectional study of patients ≤18 years with non-traumatic cardiac arrest who achieved ROSC in the prehospital or ED setting between January 2014 and December 2023 across two freestanding children's hospitals: one trauma designated and one non-trauma. Primary outcomes were seven-day survival and neurological status at discharge. Secondary outcomes included trends in blood pressure, temperature, and glucose during the first 72 h post-ROSC. Statistical comparisons utilized Wilcoxon rank-sum and Fisher's exact tests (two-sided, $p < 0.05$).

Results: Sixty-three patients met inclusion criteria (trauma $n = 45$; non-trauma $n = 18$). Median age was 3.1 years; 52% were male, and respiratory etiology accounted for 83% of cardiac arrests. Seven-day survival did not differ between trauma and non-trauma centers (55.6% vs. 55.6%, $p = 1.00$). Neurological outcomes were similar, with no new deficits in 64% of trauma and 50% of non-trauma patients ($p = 0.66$). Physiologic parameters were comparable except for higher glucose levels at 12–24 h post-ROSC in the non-trauma cohort (181 mg/dL vs. 132 mg/dL, $p = 0.009$).

Conclusion: In this dual-center cohort of pediatric non-traumatic cardiac arrests with ROSC, trauma designation was not associated with differences in early survival or neurological recovery. Both center types achieved similar post-resuscitation stabilization, suggesting that resuscitation protocols and team readiness may influence outcomes more than trauma designation alone. Larger multicenter studies are needed to assess potential long-term differences.

671 | Transcutaneous Bilirubinometry in the Pediatric Emergency Department

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Background and Objectives: Hyperbilirubinemia is a common neonatal condition requiring timely diagnosis and management to prevent complications. While transcutaneous bilirubinometry (TcB) has been widely validated and adopted in outpatient and inpatient pediatric settings, its use has not been established as standard of care in the pediatric emergency department (PED). Reliance on serum bilirubin (TSB) testing may contribute to increased length of stay (LOS) and resource utilization. The objective of this study was to evaluate the accuracy of TcB compared with TSB in neonates presenting to the PED and to assess the potential impact of TcB implementation on PED length of stay.

Methods: We conducted a prospective observational study of 36 infants. All infants were age > 168 h, gestational age > 35 weeks, birth weight > 2500 g, and had no prior history of phototherapy. TcB and TSB levels were obtained for each patient. Correlation between TcB and TSB values was assessed. PED length of stay was recorded, and a theoretical reduction in stay was estimated if TcB were implemented as a first-line screening tool.

Results: Mean TcB level was 11.0 and mean TSB level 10.5, with overall agreement of 95.5% (Chi-square, $p < 0.001$). All except 5 values were under 2.0 mg/dL difference between TcB and TSB. Of 36 TcB/TSB pairings, 30 (83.3%) were within 15% of each other. The median LOS in the PED was 151 min; modeling suggested that use of TcB as an initial screening measure could have reduced LOS by 105 min.

Conclusion: TcB shows strong concordance with TSB in neonates evaluated in the PED, supporting TcB as a reliable screening method in the PED. Implementation of TcB could decrease LOS and improve efficiency of care without compromising diagnostic accuracy. Incorporating TcB into PED workflows has the potential to streamline neonatal hyperbilirubinemia evaluation and optimize resource utilization.

672 | Guideline-Discordant Bronchiolitis Care in Community Emergency Departments

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Background and Objectives: Many children with bronchiolitis receive tests and treatments that are not recommended by the American Academy of Pediatrics (AAP) in community emergency departments (EDs). This guideline-discordant care (GDC) increases patient risk, hospital costs, and ED length of stay (LOS). Few studies have investigated the impact of AAP guidelines on the current burden of GDC in community EDs or factors associated with receiving this low-value care. A contemporary benchmark of GDC in community EDs is necessary to develop and implement intervention to improve care delivery.

Methods: Our retrospective observational study of children with bronchiolitis from 2017–2024 included patients 28 days–2 years old without significant chronic comorbidities precluding application of AAP bronchiolitis guidelines. All patients were discharged from a community ED in our Northern California health system. Outcomes were GDC defined as receiving one or more tests or treatments not recommended by the AAP (albuterol, chest radiography, steroids, antibiotics and racemic epinephrine) and ED LOS. We examined patient and clinical characteristics associated with GDC and its association with ED LOS using multivariable regression.

Results: There were 6,083 eligible encounters from 5,989 unique patients. The majority of children with bronchiolitis (62%) received GDC with chest radiography (41%) and albuterol (37%) being most common. GDC was associated with longer median ED LOS (142 min, 95% CI: 140–145 min) compared with

no GDC (84 min, 95% CI: 82–86 min). Receipt of both albuterol and chest radiography was associated with the longest lengths of stay [177 min (95% CI: 172–182 min)]. After adjustment, abnormal vital signs, older age, male sex, and past albuterol exposure were associated with increased likelihood of GDC.

Conclusion: GDC was common over the study period and associated with longer ED LOS. Important patient-level factors may increase the likelihood of GDC. Interventions that mitigate GDC are high-yield opportunities to improve care delivery in community EDs.

673 | Predicting Treatment Failure in Young Children With Moderate-to-Severe Wheezing in the Emergency Department

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Background and Objectives: Asthma and wheezing-related illnesses are leading reasons for hospitalization of young children, but limited evidence exists to predict response to emergency department (ED) therapy. Prior research suggests that clinical history and nasopharyngeal (NP) viral or bacterial detection may be related to failure to respond to treatment. The objective of this secondary analysis was to determine demographic, clinical and microbiologic factors associated with failure to respond to standard asthma therapy for children age 18–59 months presenting to the ED with moderate-to-severe wheezing.

Methods: Children age 18–59 months were enrolled in a multicenter NHLBI PECARN funded clinical trial comparing azithromycin to placebo who presented to one of eight EDs with moderate-to-severe wheezing defined by a validated clinical score (initial PRAM >4–12). All children were treated with high-dose albuterol, ipratropium and corticosteroids per standard protocol. Baseline factors included prior wheezing history, clinical assessment, and NP molecular testing. Primary outcome was failure to respond to initial ED treatment, defined as hospital admission, ED length of stay >8 h, or discharge with return visit for wheezing within 72 h. Statistical methods included univariable comparisons and multivariable logistic regression examining factors associated with failure to respond.

Results: We enrolled 840 children over a 3-year period and 626 had full data for multivariable analysis. Most children tested positive for a respiratory virus (86.3%) or bacteria (62.6%). Treatment failure occurred for 335 children due to ED/hospital stay longer than 8 h and for 3 patients who returned within 72 h of discharge. Factors associated with treatment failure included female sex, initial acute severity measured by PRAM score, infection with any respiratory virus, >1 prior hospitalization for wheezing in the past year, and exposure to second-hand smoke. NP infection with bacteria, race/ethnicity and the study intervention of treatment with azithromycin were not associated with treatment failure.

Conclusion: Measures of acute and chronic severity of respiratory illness, second-hand smoke exposure, and infection with a respiratory virus, but not bacteria, were associated with increased odds of failure to respond to ED treatment in this prospective cohort of young children treated for acute wheezing.

674 | Boosting Confidence in Emergent Umbilical Venous Catheter Placement: A Just-In-Time Training Video

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Background and Objectives: Emergency Medicine physicians must be ready to manage critically ill neonates but may lack comfort with umbilical vein catheter (UVC) placement. UVCs offer safe and effective intravenous access, yet optimal methods to ensure competency in this infrequent procedure are unclear. To evaluate whether a just-in-time (JIT) video improves physicians' knowledge, confidence, and skill in UVC placement.

Methods: We performed a prospective study using a JIT video in a simulated encounter at a tertiary pediatric hospital. Eligible participants were physicians completing their semiannual competency session. Experience, knowledge, and confidence were assessed via a survey adapted from prior studies. Participants' hands were recorded placing a UVC in a low-fidelity manikin. Two independent raters reviewed anonymized videos and graded performance using a nine-item checklist adapted from the Neonatal Resuscitation Program (NRP®). A 2-min JIT video demonstrating emergent UVC placement was created based on baseline data. One year later, participants received the video before repeating the survey and skill. Pre- and post-intervention data were compared using the Wilcoxon matched-pairs signed-rank test.

Results: Of 35 eligible faculty, 15 completed the study. Only 2 (13%) had placed more than 10 UVCs; most (73%) last placed one more than 5 years ago. Participants showed significant improvement after viewing the JIT video. Median checklist scores increased from 6/9 at baseline to 9/9 post-intervention ($p < 0.001$). All checklist items improved, with the largest gains in selecting the correct catheter (+67%) and flushing the catheter (+53%). Confidence rose from a median of 2 to 4 on a 5-point Likert scale ($p = 0.015$). Knowledge scores increased from a median of 2 to 4.5 out of 5 ($p = 0.002$).

Conclusion: A focused JIT training video significantly improved physicians' knowledge, confidence, and performance in simulated UVC placement at our academic center.