PICU
Evidence Update
April 2018
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Training Calendar 2018

April (12.00-13.00)
17th (Tue) Statistics
25th (Wed) Literature Searching

May (13.00-14.00)
3rd (Thu) Critical Appraisal
11th (Fri) Statistics
14th (Mon) Literature Searching
22nd (Tue) Critical Appraisal
30th (Wed) Statistics
Increasing admissions to paediatric intensive care units in England and Wales: more than just rising a birth rate

Peter Davis 1, Christopher Stutchfield 1, T Alun Evans 2,3, Elizabeth Draper 2,3

1 Paediatric Intensive Care Unit, Bristol Royal Hospital for Children, Bristol, UK
2 Department of Health Sciences, University of Leicester, Leicester, UK
3 Paediatric Intensive Care Audit Network (PICANet), Universities of Leeds and Leicester, Leicester, UK

Objective To determine the number of individual children admitted to Paediatric Intensive Care Units (PICUs) in England and Wales between 2004 and 2013 and to investigate potential factors for any change over time, including ethnicity.

Methods Anonymised demographic and epidemiological data were extracted from the Paediatric Intensive Care Audit Network (PICANet) database and analysed for all children resident in England and Wales admitted to PICUs of National Health Service (NHS) hospitals in those countries between 2004 and 2013. Population data, including births, were obtained from the Office of National Statistics and analysed. Predicted numbers of children admitted to PICU were compared with actual admissions, averaged over 3-year periods.

Results Increasing numbers of individual children were admitted to PICUs in England and Wales between 2004 and 2013. The largest increases were among younger children (0–5 years) and those with primary respiratory or cardiac diagnoses. They were also greatest in regions with the most mothers born overseas. From 2009 onwards, more children were admitted to PICUs than predicted, separate from overall population growth, South Asian ethnicity or requirement for ventilation.

Conclusions An additional increase in the number of children from England and Wales admitted to PICU from 2009 onwards is not explained by a rising child population or an increased risk of admission among South Asian children. There was no evidence of a reduction in the admission criteria to PICUs. Given healthcare funding in England and Wales, continued increases would present a challenging prospect for both providers and commissioners of these services.
Lung ultrasound reclassification of chest X-ray data after pediatric cardiac surgery
Massimiliano Cantinotti, Lamia Ait Ali, Marco Scalese, Raffaele Giordano, Manuel Melo, Ettore Remoli, Eliana Franchi, Alberto Clemente, Riccardo Moschetti, Pierluigi Festa, Dorela Haxiademi and Luna Gargani
Version of Record online: 25 MAR 2018 | DOI: 10.1111/pan.13360

A red cell preservation strategy reduces postoperative transfusions in pediatric heart surgery patients
Meena Nathan, Brielle Tishler, Kimberlee Gauvreau, Gregory S. Matte, Robert J. Howe, Linda Durham, Sharon Boyle, Derek Mathieu, Francis Fynn-Thompson, James A. DiNardo and Juan C. Ibla
Version of Record online: 25 MAR 2018 | DOI: 10.1111/pan.13368

Pediatric Critical Care Medicine
March 2018 - Volume 19 - Issue 3

Pediatrics
April 2018, VOLUME 141 / ISSUE 4

Influenza-Associated Pediatric Deaths in the United States, 2010–2016
Mei Shang, Lenee Blanton, Lynnette Brammer, Sonja J. Olsen and Alicia M. Fry

Opioid-Related Critical Care Resource Use in US Children’s Hospitals
Jason M. Kane, Jeffrey D. Colvin, Allison H. Bartlett and Matt Hall

Vomiting With Head Trauma and Risk of Traumatic Brain Injury

Changes in Parental Hopes for Seriously Ill Children
### Latest Evidence

**Weaning children from the breathing machine in the children's intensive care unit**

Source: [UK Clinical Trials Gateway - UKCTG](https://www.ukctg.nihr.ac.uk/) - 08 March 2018

on the ventilator). If this shows the patient is ready to come off the ventilator, the child is extubated using the PICU's usual...

More: [Ongoing Trials](https://www.ukctg.nihr.ac.uk/)

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**Searched but nothing relevant to add.**

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**Searched but nothing relevant to add.**
Library Clinic

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May 2nd: Canteen (Level 9, BRI) 12.00-14.00

June 6th: Terrace (Level 4, Education Centre) 12.00-14.00

June 19th: Welcome Centre, BRI 10.00-16.00

July 3rd: Welcome Centre, BRI 10.00-16.00

July 4th: Canteen (Level 9, BRI) 12.00-14.00

August 8th: Foyer, Education Centre 12.00-14.00

August 29th: Foyer, St Michael’s Hospital 12.00-14.00

September 5th: Canteen (Level 9, BRI) 12.00-14.00

September 11th: Welcome Centre, BRI 10.00-16.00

October 3rd: Terrace (Level 4, Education Centre) 12.00-14.00

November 7th: Canteen (Level 9, BRI) 12.00-14.00

December 5th: Foyer, Education Centre 12.00-14.00

December 11th: Welcome Centre, BRI 10.00-16.00
Database Articles

Below is a selection of articles recently added to the healthcare databases. If you would like any of the following articles in full text, or if you would like a more focused search on your own topic, then get in touch: library@uhbristol.nhs.uk

- **An Exploratory Study of Sevoflurane as an Alternative for Difficult Sedation in Critically Ill Children.**
- **Interhospital Transport of Critically Ill Children to PICUs in the United Kingdom and Republic of Ireland: Analysis of an International Dataset.**
- **Assessment of Recovery Following Pediatric Traumatic Brain Injury.**

1. **Ventilator Associated Pneumonia in Pediatric Intensive Care Unit: Incidence, Risk Factors and Etiological Agents.**

**Author(s):** Vijay, Gnanaguru; Mandal, Anirban; Sankar, Jhuma; Kapil, Arti; Lodha, Rakesh; Kabra, S K

**Source:** Indian journal of pediatrics; Apr 2018

**Publication Date:** Apr 2018

**Publication Type(s):** Journal Article

**PubMedID:** 29616405

**Abstract:** OBJECTIVES To study the incidence, etiology and risk factors associated with ventilator associated pneumonia (VAP) in children.

METHODS This prospective cohort study was conducted on patients admitted to the Pediatric Intensive Care Unit (PICU) of a tertiary care institute of North India, from June 2012 through March 2014, who received mechanical ventilation for more than 24 h. All enrolled children were assessed daily for development of ventilator associated pneumonia (VAP) using the case definition given by Centers for Disease Control and Prevention (CDC). Chest radiograph and microbiologic samplings were performed in children suspected to have VAP. Risk factors associated with VAP were calculated by doing bivariate and multivariate analysis.

RESULTS A total of 128 patients were screened and 86 were enrolled (median age 30 mo 95% CI 4.0-84.0; 72% boys). The most common admitting diagnosis was sepsis (16%) followed by acyanotic congenital heart disease with pneumonia (14%) and the most common indication for ventilation was respiratory failure (45.3%). The incidence of VAP according to CDC criteria was 38.4%, while the incidence of microbiologically confirmed VAP was 24.4%. The incidence of ventilator associated tracheobronchitis (VAT) was found to be 11.6%. Acinetobacter was the most frequently isolated organism (47%) followed by Pseudomonas (28%), Klebsiella (15%), E. coli (5%) and Enterobacter (5%). Risk factors for VAP on bivariate analysis were use of proton pump inhibitor (PPI) (p = 0.027, OR 5.2, 95% CI 1.1-24.3), enteral feeding (p < 0.001, OR 6.5, 95% CI 2.1-19.4) and re-intubation (p = 0.024, OR 3.3 and 95% CI 1.1-9.6). On multivariate analysis, use of PPI (p = 0.03, OR 8.47, 95% CI 1.19-60.33) and enteral feeding (p < 0.001, OR 12.2, 95% CI 2.58-57.78) were identified as independent risk factors for VAP.

CONCLUSIONS Ventilator associated pneumonia is an important complication in children receiving mechanical ventilation in PICU and Gram negative bacilli (Acinetobacter and Pseudomonas) being the important causative agents. Ventilator associated tracheobronchitis is an emerging entity; recognition and treatment of same might prevent the development of VAP.

**Database:** Medline
2. Ultrasound guidance for internal jugular vein cannulation in PICU: a randomised controlled trial.

**Author(s):** de Souza, Tiago Henrique; Brandão, Marcelo Barciela; Santos, Thiago Martins; Pereira, Ricardo Mendes; Nogueira, Roberto José Negrão

**Source:** Archives of disease in childhood; Apr 2018

**Publication Date:** Apr 2018

**Publication Type(s):** Journal Article

**PubMedID:** 29618485

Available at [Archives of disease in childhood](https://www.archdischild.net/content/103/4/287) - from BMJ Journals - NHS

**Abstract:**

**OBJECTIVE:** We investigated whether ultrasound guidance was advantageous over the anatomical landmark technique when performed by inexperienced paediatricians.

**DESIGN:** Randomised controlled trial.

**SETTING:** Paediatric intensive care unit of a teaching hospital.

**PATIENTS:** 80 children (aged 28 days to <14 years).

**INTERVENTIONS:** Internal jugular vein cannulation with ultrasound guidance in real time or the anatomical landmark technique.

**MAIN OUTCOME MEASURES:** Success rate, success rate on the first attempt, success rate within three attempts, puncture time, number of attempts required for success and occurrence of complications.

**RESULTS:** We found a higher success rate in the ultrasound guidance than in the control group (95% vs 61%, respectively; p<0.001; relative risk (RR)=0.64, 95% CI (CI) 0.50 to 0.83). Success on the first attempt was seen in 95% and 34% of venous punctures in the US guidance and control groups, respectively (p<0.001; RR=0.35, 95% CI 0.23 to 0.54). Fewer than three attempts were required to achieve success in 95% of patients in the US guidance group but only 44% in the control group (p<0.001; RR=0.46, 95% CI 0.32 to 0.66). Haematomas, inadvertent arterial punctures, the number of attempts and the puncture time were all significantly lower in the ultrasound guidance than in the control group (p<0.015 for all).

**CONCLUSIONS:** Critically ill children may benefit from the ultrasound guidance for internal jugular cannulation, even when the procedure is performed by operators with limited experience.

**TRIAL REGISTRATION NUMBER:** RBR-4t35tk.

**Database:** Medline

3. Delirium is a Common and Early Finding in Patients in the Pediatric Cardiac Intensive Care Unit.

**Author(s):** Alvarez, Rita V; Palmer, Claire; Czaja, Angela S; Peyton, Chris; Silver, Gabrielle; Traube, Chani; Mourani, Peter M; Kaufman, Jon

**Source:** The Journal of pediatrics; Apr 2018; vol. 195 ; p. 206-212

**Publication Date:** Apr 2018

**Publication Type(s):** Journal Article

**PubMedID:** 29395177

**Abstract:**

**OBJECTIVE:** To determine incidence, associated risk factors, and characteristics of delirium in a pediatric cardiac intensive care unit (CICU). Delirium is a frequent and serious complication in adults after cardiac surgery, but there is limited understanding of its impact in children with critical cardiac disease.

**STUDY DESIGN:** Single-center prospective observational study of CICU patients ≤21 years old. All were screened for delirium using the Cornell Assessment for Pediatric Delirium each 12-hour shift.

**RESULTS:** Ninety-nine patients were included. Incidence of delirium was 57%. Median time to development of delirium was
1 day (95% CI 0, 1 days). Children with delirium were younger (geometric mean age 4 vs 46 months; P < .001), had longer periods of mechanical ventilation (mean 35.9 vs 8.8 hours; P = .002) and had longer cardiopulmonary bypass times (geometric mean 126 vs 81 minutes; P = .001). Delirious patients had longer length of CICU stay than those without delirium (median 3 (IQR 2, 12.5) vs 1 (IQR1, 2) days; P < .0001). A multivariable generalized linear mixed model showed a significant association between delirium and younger age (OR 0.35 for each additional month, 95% CI 0.19, 0.64), need for mechanical ventilation (OR 4.1, 95% CI 1.7, 9.89), and receipt of benzodiazepines (OR 3.78, 95% CI 1.46, 9.79). CONCLUSIONS: Delirium is common in patients in the pediatric CICU and is associated with longer length of stay. There may be opportunities for prevention of delirium by targeting modifiable risk factors, such as use of benzodiazepines.

Database: Medline


Author(s): Richards, Claire A; Starks, Helene; O'Connor, M Rebecca; Bourget, Erica; Hays, Ross M; Doorenbos, Ardith Z

Source: The American journal of hospice & palliative care; Apr 2018; vol. 35 (no. 4); p. 669-676

Publication Date: Apr 2018
Publication Type(s): Journal Article
PubMedID: 28990396

Abstract: BACKGROUND: Most children die in neonatal and pediatric intensive care units after decisions are made to withhold or withdraw life-sustaining treatments. These decisions can be challenging when there are different views about the child's best interest and when there is a lack of clarity about how best to also consider the interests of the family. OBJECTIVE: To understand how neonatal and pediatric critical care physicians balance and integrate the interests of the child and family in decisions about life-sustaining treatments. METHOD: Semistructured interviews were conducted with 22 physicians from neonatal, pediatric, and cardiothoracic intensive care units in a single quaternary care pediatric hospital. Transcribed interviews were analyzed using content and thematic analysis. RESULTS: We identified 3 main themes: (1) beliefs about child and family interests; (2) disagreement about the child's best interest; and (3) decision-making strategies, including limiting options, being directive, staying neutral, and allowing parents to come to their own conclusions. Physicians described challenges to implementing shared decision-making including unequal power and authority, clinical uncertainty, and complexity of balancing child and family interests. They acknowledged determining the level of engagement in shared decision-making with parents (vs routine engagement) based on their perceptions of the best interests of the child and parent. CONCLUSIONS: Due to power imbalances, families' values and preferences may not be integrated in decisions or families may be excluded from discussions about goals of care. We suggest that a systematic approach to identify parental preferences and needs for decisional roles and information may reduce variability in parental involvement.

Database: Medline

BACKGROUND Information is lacking about the severity of complications in children with influenza admitted to paediatric intensive care units (PICU) in the UK. In this study, we report risk factors for mortality, invasive ventilation and use of vasoactive drugs for children admitted to PICU with influenza.

METHODS We evaluated all admissions to PICUs in England for resident children with a recorded influenza diagnosis between September 2003 and March 2015. We used the Paediatric Intensive Care Audit Network (PICANet) database linked to hospital admission records to identify influenza cases, and high-risk comorbidities among admitted children. We used mixed effects logistic regression models to determine risk factors for mortality, use of invasive ventilation and vasoactive drugs.

RESULTS We identified 1961 influenza-related PICU admissions in 1778 children. Children with high-risk conditions accounted for 1540 admissions (78.5%). The odds of mortality were significantly higher for girls than boys (adjusted odds ratio 1.91; 95% confidence interval 1.31, 2.79), children from Asian/Asian British (2.70; 1.74, 4.20) or other minority ethnic groups (3.95; 1.65, 9.42) compared to white British children, and significantly increased before and during the A(H1N1)pdm 2009 pandemic compared to the post-pandemic period. Children required invasive ventilation in 1588 admissions (81.0%), and received vasoactive drugs in 586 admissions (29.9%).

CONCLUSIONS Nearly four fifths of influenza-related PICU admissions occurred in children with high-risk conditions, highlighting the burden of severe influenza in this vulnerable population. Further research is required to explain sex and ethnic group differences in PICU mortality among children admitted with influenza.

Database: Medline


Author(s): Brossier, David; El Taani, Redha; Sauthier, Michael; Roumeliotis, Nadia; Emeriaud, Guillaume; Jouvet, Philippe

Source: Pediatric critical care medicine : a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies; Apr 2018; vol. 19 (no. 4); p. e189

Publication Date: Apr 2018

Publication Type(s): Journal Article

PubMedID: 29406373

Available at Pediatric Critical Care Medicine from Ovid (Journals @ Ovid) - Remote Access

Abstract: OBJECTIVE Our objective was to construct a prospective high-quality and high-frequency database combining patient therapeutics and clinical variables in real time, automatically fed by the information system and network architecture available through fully electronic charting in our PICU. The purpose of this article is to describe the data acquisition process from bedside to the research electronic database. DESIGN Descriptive report and analysis of a prospective database. SETTING A 24-bed PICU, medical ICU, surgical ICU, and cardiac ICU in a tertiary care free-standing maternal child health center in Canada. PATIENTS All patients less than 18 years old were included at admission to the...
Between May 21, 2015, and December 31, 2016, 1,386 consecutive PICU stays from 1,194 patients were recorded in the database. Data were prospectively collected from admission to discharge, every 5 seconds from monitors and every 30 seconds from mechanical ventilators and infusion pumps. These data were linked to the patient’s electronic medical record. The database total volume was 241 GB. The patients' median age was 2.0 years (interquartile range, 0.0-9.0). Data were available for all mechanically ventilated patients (n = 511; recorded duration, 77,678 hr), and respiratory failure was the most frequent reason for admission (n = 360). The complete pharmacologic profile was synched to database for all PICU stays.

Following this implementation, a validation phase is in process and several research projects are ongoing using this high-fidelity database. CONCLUSIONS Using the existing bedside information system and network architecture of our PICU, we implemented an ongoing high-fidelity prospectively collected electronic database, preventing the continuous loss of scientific information. This offers the opportunity to develop research on clinical decision support systems and computational models of cardiorespiratory physiology for example.

Database: Medline


Author(s): Slovis, Julia C; Gupta, Nachi; Li, Natasha Y; Kernie, Steven G; Miles, Darryl K

Source: Pediatric critical care medicine : a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies; Apr 2018; vol. 19 (no. 4); p. 353-360

Publication Date: Apr 2018

Publication Type(s): Journal Article

PubMedID: 29419604

Abstract: OBJECTIVES We analyzed a prospective database of pediatric traumatic brain injury patients to identify predictors of outcome and describe the change in function over time. We hypothesized that neurologic status at hospital discharge would not reflect the long-term neurologic recovery state.

DESIGN This is a descriptive cohort analysis of a single-center prospective database of pediatric traumatic brain injury patients from 2001 to 2012. Functional outcome was assessed at hospital discharge, and the Glasgow Outcome Scale Extended Pediatrics or Glasgow Outcome Scale was assessed on average at 15.8 months after injury.

SETTING Children's Medical Center Dallas, a single-center PICU and Level 1 Trauma Center.

PATIENTS Patients, 0-17 years old, with complicated-mild/moderate or severe accidental traumatic brain injury.

MEASUREMENTS AND MAIN RESULTS Dichotomized long-term outcome was favorable in 217 of 258 patients (84%), 80 of 82 patients (98%) with complicated-mild/moderate injury and 133 of 172 severe patients (77%). In the bivariate analysis, younger age, motor vehicle collision as a mechanism of injury, intracranial pressure monitor placement, cardiopulmonary resuscitation at scene or emergency department, increased hospital length of stay, increased ventilator days (all with p < 0.01) and occurrence of seizures (p = 0.03) were significantly associated with an unfavorable outcome. In multiple regression analysis, younger age (p = 0.03), motor vehicle collision (p = 0.01), cardiopulmonary resuscitation (p < 0.01), and ventilator days (p < 0.01) remained significant. Remarkably, 28 of 60 children (47%) with an unfavorable Glasgow Outcome Scale at hospital discharge improved to a favorable outcome. In severe patients with an unfavorable outcome at hospital discharge, younger age was identified as a risk factor for remaining in an unfavorable condition (p = 0.1).

CONCLUSIONS Despite a poor neurologic
status at hospital discharge, many children after traumatic brain injury will significantly improve at long-term assessment. The factors most associated with outcomes were age, cardiopulmonary resuscitation, motor vehicle collision, intracranial pressure placement, days on a ventilator, hospital length of stay, and seizures. The factor most associated with improvement from an unfavorable neurologic status at discharge was being older.

**Database:** Medline

8. Cerebral Oxygen Metabolism Before and After RBC Transfusion in Infants Following Major Surgical Procedures.

**Author(s):** Neunhoeffer, Felix; Hofbeck, Michael; Schuhmann, Martin Ulrich; Fuchs, Jörg; Schlensak, Christian; Esslinger, Martin; Gerbig, Ines; Icheva, Vanya; Heimberg, Ellen; Kumpf, Matthias; Michel, Jörg

**Source:** Pediatric critical care medicine : a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies; Apr 2018; vol. 19 (no. 4); p. 318-327

**Publication Date:** Apr 2018

**Publication Type(s):** Journal Article

**PubMedID:** 29406374

Available at [Pediatric Critical Care Medicine](https://link.ovid.com/JCCM/29406374) - from Ovid (Journals @ Ovid) - Remote Access

**Abstract:** OBJECTIVE Although infants following major surgery frequently require RBC transfusions, there is still controversy concerning the best definition for requirement of transfusion in the individual patient. The aim of this study was to determine the impact of RBC transfusion on cerebral oxygen metabolism in noncardiac and cardiac postsurgical infants. DESIGN Prospective observational cohort study. SETTING Pediatric critical care unit of a tertiary referral center. PATIENTS Fifty-eight infants (15 after pediatric surgery and 43 after cardiac surgery) with anemia requiring RBC transfusion were included. INTERVENTIONS RBC transfusion. MEASUREMENTS AND MAIN RESULTS We measured noninvasively regional cerebral oxygen saturation and microperfusion (relative cerebral blood flow) using tissue spectrometry and laser Doppler flowmetry before and after RBC transfusion. Cerebral fractional tissue oxygen extraction and approximated cerebral metabolic rate of oxygen were calculated. Fifty-eight RBC transfusions in 58 patients were monitored (15 after general surgery, 24 after cardiac surgery resulting in acyanotic biventricular physiology and 19 in functionally univentricular hearts including hypoplastic left heart following neonatal palliation). The posttransfusion hemoglobin concentrations increased significantly (9.7 g/dL vs 12.8 g/dL; 9.7 g/dL vs 13.8 g/dL; 13.1 g/dL vs 15.6 g/dL; p < 0.001, respectively). Posttransfusion cerebral oxygen saturation was significantly higher than pretransfusion (61% [51-78] vs 72% [59-89]; p < 0.001; 58% [35-77] vs 71% [57-88]; p < 0.001; 51% [37-61] vs 58% [42-73]; p = 0.007). Cerebral fractional tissue oxygen extraction decreased posttransfusion significantly 0.37 (0.16-0.47) and 0.27 (0.07-0.39), p = 0.002; 0.40 (0.2-0.62) vs 0.26 (0.11-0.57), p = 0.001; 0.42 (0.23-0.52) vs 0.32 (0.1-0.42), p = 0.017. Cerebral blood flow and approximated cerebral metabolic rate of oxygen showed no significant change during the observation period. The increase in cerebral oxygen saturation and the decrease in cerebral fractional tissue oxygen extraction were most pronounced in patients after cardiac surgery with a pretransfusion cerebral fractional tissue oxygen extraction greater than or equal to 0.4. CONCLUSION Following RBC transfusion, cerebral oxygen saturation increases and cerebral fractional tissue oxygen extraction decreases. The data suggest that cerebral oxygenation in postoperative infants with cerebral fractional tissue oxygen

**Author(s):** Manning, Joseph C; Pinto, Neethi P; Rennick, Janet E; Colville, Gillian; Curley, Martha A Q.

**Source:** Pediatric critical care medicine: a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies; Apr 2018; vol. 19 (no. 4); p. 298-300

**Publication Date:** Apr 2018

**Publication Type(s):** Journal Article

**PubMedID:** 29406379

**Abstract:**

**CONTEXT:** Over the past several decades, advances in pediatric critical care have saved many lives. As such, contemporary care has broadened its focus to also include minimizing morbidity. Post Intensive Care Syndrome, also known as "PICS," is a group of cognitive, physical, and mental health impairments that commonly occur in patients after ICU discharge. Post Intensive Care Syndrome has been well-conceptualized in the adult population but not in children.

**OBJECTIVE:** To develop a conceptual framework describing Post Intensive Care Syndrome in pediatrics that includes aspects of the experience that are unique to children and their families.

**DATA SYNTHESIS:** The Post Intensive Care Syndrome in pediatrics (PICS-p) framework highlights the importance of baseline status, organ system maturation, psychosocial development, the interdependence of family, and trajectories of health recovery that can potentially impact a child's life for decades.

**CONCLUSION:** Post Intensive Care Syndrome in pediatrics will help illuminate the phenomena of surviving childhood critical illness and guide outcomes measurement in the field. Empirical studies are now required to validate and refine this framework, and to subsequently develop a set of core outcomes for this population. With explication of Post Intensive Care Syndrome in pediatrics, the discipline of pediatric critical care will then be in a stronger position to map out recovery after pediatric critical illness and to evaluate interventions designed to mitigate risk for poor outcomes with the goal of optimizing child and family health.

**Database:** Medline

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**Author(s):** Lautz, Andrew J; Martin, Kelly C; Nishisaki, Akira; Bonafide, Christopher P; Hales, Roberta L; Hunt, Elizabeth A; Nadkarni, Vinay M; Sutton, Robert M; Boyer, Donald L

**Source:** Hospital pediatrics; Apr 2018; vol. 8 (no. 4); p. 227-231

**Publication Date:** Apr 2018

**Publication Type(s):** Journal Article

**PubMedID:** 29514852

**Abstract:**

**OBJECTIVES:** Miscommunication has been implicated as a leading cause of medical errors, and standardized handover programs have been associated with improved patient outcomes. However, the role of structured handovers in pediatric emergencies remains...
unclear. We sought to determine if training with an airway, breathing, circulation, situation, background, assessment, recommendation handover tool could improve the transmission of essential patient information during multidisciplinary simulations of critically ill children.

METHODS We conducted a prospective, randomized, intervention study with first-year pediatric residents at a quaternary academic children's hospital. Baseline and second handovers were recorded for residents in the intervention group (n = 12) and residents in the control group (n = 8) during multidisciplinary simulations throughout the academic year. The intervention group received handover education after baseline handover observation and a cognitive aid before second handover observation. Audio-recorded handovers were scored by using a Delphi-developed assessment tool by a blinded rater.

RESULTS There was no difference in baseline handover scores between groups (P = .69), but second handover scores were significantly higher in the intervention group (median 12.5 [interquartile range 12-13] versus median 7.5 [interquartile range 6-8] in the control group; P < .01). Trained residents were more likely to include a reason for the call (P < .05).

CONCLUSIONS Structured handover training and provision of a cognitive aid may improve the inclusion of essential patient information in the handover of simulated critically ill children.

Database: Medline

11. Can energy intake alter clinical and hospital outcomes in PICU?

Author(s): Larsen, Bodil M K; Beggs, Megan R; Leong, Amanda Y; Kang, Sung Hyun; Persad, Rabin; Garcia Guerra, Gonzalo

Source: Clinical nutrition ESPEN; Apr 2018; vol. 24; p. 41-46

Publication Date: Apr 2018

Publication Type(s): Journal Article

PubMedID: 29576361

Abstract: BACKGROUND & AIMSEnergy is essential for the treatment and recovery of children admitted to Pediatric Intensive Care Units (PICU). There are significant immediate and long-term health consequences of both under- and over-feeding in this population. Energy requirements of critically ill children vary depending on age, nutritional status, sepsis, fever, pharmacotherapy, and duration and stage of critical illness. This study aimed to determine the incidence of over- and under-feeding and to compare hospital outcomes between these feeding categories. Secondary outcomes were collected to describe the association between feeding categories and biochemistries (serum lactate, triglycerides, C-reactive protein). METHODS An ethics approved retrospective study of children admitted to PICU was performed. All intubated patients admitted to PICU (2008-2013) were included, except those in which an IC test was not feasible. Data collection included demographics, the primary outcome variable reported as under feeding (110% MREE) determined through comparison of measured resting energy expenditure (MREE) using indirect calorimetry (IC) to actual energy intake based on predicted basal metabolic rate (PBMR) and clinical outcomes mechanical ventilation and PICU length of stay (LOS). Data were analysed with descriptive methods, ANOVA and linear regression models. RESULTS A total of 139 patients aged 10 (range 0.03-204) months were included. Sixty (43%) were female and 77 (55%) were admitted after a surgical procedure. A total of 210 IC tests were conducted showing a statistically significant difference between MREE measurements and PBMR (p = 0.019). Of the 210 measurements, only 26 measures (12.4%) demonstrated appropriate feeding, while 72 (34.3) were underfed and 112 (53.3%) were overfed. Children who were overfed had significantly longer PICU LOS (median 45.5, IQR 47.8 days) compared to those children in the appropriately fed (median 21.0, IQR 54.5 days), and underfed groups (median 16.5, IQR 21.3
days). There was a mean difference between the over and under feeding category and ventilation days after adjusting for age and PRISM score ($p = 0.026$), suggesting decreased mechanical ventilation days for underfed. Children who were underfed had significantly higher CRP (median 75.5, IQR 152.8 mg/L) compared to those children in the appropriately fed (median 57.8, IQR 90.9 mg/L) and overfed groups (median 22.4, IQR 56.2 mg/L). CONCLUSIONS This retrospective study confirms that estimations of energy expenditure in critically ill children are inaccurate leading to unintended under and overfeeding. Importantly under feeding seems to be associated with fewer mechanical ventilation days and PICU LOS. Further research is required to elucidate the role of optimal nutrition in altering clinical variables in this population.

**Database:** Medline
Library Opening Times

Staffed hours: 8am-5pm, Monday to Friday

Swipe-card access: 7am-11pm, seven days a week

Level 5, Education and Research Centre

University Hospitals Bristol