PICU
Current Awareness Newsletter
October 2015
Outreach

Your Outreach Librarian can help facilitate evidence-based practise for all PICU staff, as well as assisting with academic study and research. We can help with literature searching, obtaining journal articles and books, and setting up individual current awareness alerts.

Literature Searching
We provide a literature searching service for any library member. For those embarking on their own research it is advisable to book some time with one of the librarians for a 1 to 1 session where we can guide you through the process of creating a well-focused literature research and introduce you to the health databases access via NHS Evidence.

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We also offer one-to-one or small group training in literature searching, accessing electronic journals, and critical appraisal/Statistics. These are essential courses that teach how to interpret clinical papers.

For more information, email: katie.barnard@uhbristol.nhs.uk

Books
Books can be searched for using SWIMS our online catalogue at www.swims.nhs.uk. Books and journals that are not available on site or electronically may be requested from other locations. Please email requests to: library@uhbristol.nhs.uk
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1: Tables of Contents from October’s Paediatric journals

2: Latest relevant Systematic Reviews from the Cochrane Library

3: New activity in Uptodate

4: Current Awareness database articles
Tables of Contents from Paediatric & Critical Care journals

If you require full articles please email: library@uhbristol.nhs.uk

**Paediatric Critical Care Medicine**

**September 2015, Volume 16, Issue 7**

**Gastric Acid Suppressant Prophylaxis in Pediatric Intensive Care: Current Practice as Reflected in a Large Administrative Database***

**Trends in PICU Admission and Survival Rates in Children in Australia and New Zealand Following Cardiac Arrest***

**Hyperglycemia at the Time of Acquiring Central Catheter–Associated Bloodstream Infections Is Associated With Mortality in Critically Ill Children***

**Postoperative Hydrocortisone Infusion Reduces the Prevalence of Low Cardiac Output Syndrome After Neonatal Cardiopulmonary Bypass***

**Thermal Blanket to Improve Thermoregulation in Preterm Infants: A Randomized Controlled Trial**

**Evaluation of Electronic Medical Record Vital Sign Data Versus a Commercially Available Acuity Score in Predicting Need for Critical Intervention at a Tertiary Children’s Hospital**

**Neuroimaging, Pain Sensitivity, and Neuropsychological Functioning in School-Age Neonatal Extracorporeal Membrane Oxygenation Survivors Exposed to Opioids and Sedatives**

**Urinary Neutrophil Gelatinase–Associated Lipocalin Predicts Renal Injury Following Extracorporeal Membrane Oxygenation**

**Gastric Acid Suppression—More Data, Less Answers***

**Pediatric Cardiac Arrests Are a Big Problem No Matter What the Denominator***

**Another Target for Glycemic Control in Critically Ill Children***

**The Role of Prophylactic Postoperative Steroids in Pediatric Cardiac Operations***

**Can Racemic Albuterol Help Patients With Respiratory Failure in the PICU***

**Goal-Directed Mechanical Ventilation in Pediatric Acute Respiratory Distress Syndrome: What Pressure Variable Should Be the Goal***

**Detection Versus Infection; What Is the Difference***

**Allocation of Resources During Crisis: Data Infused With Wisdom, Ethics, and Transparency***

**Fluid Overload in General PICU**

**The authors reply**
Optimizing Timing of Tracheostomy Placement in the PICU: Why Defining Success Will Require a Longer View

**Pediatrics**
September 2015, Volume 136, Issue 3

Survival of Children With Hypoplastic Left Heart Syndrome

Nebulized Hypertonic Saline for Acute Bronchiolitis: A Systematic Review

Family Experience and PICU Death: A Meta-Synthesis

A Novel Use of Methylene Blue in the Pediatric ICU

**Current Opinion in Pediatrics**
October 2015, Volume 27, Issue 5

Long-term challenges in congenital heart disease

The pediatric heart network: meeting the challenges to multicenter studies in pediatric heart disease

Quality improvement through collaboration: the National Pediatric Quality improvement Collaborative initiative

The vulnerable right ventricle

The Fontan operation: the long-term outlook

Computational modeling and engineering in pediatric and congenital heart disease

Advances in mechanical assist devices and artificial hearts for children

Therapy of caustic ingestion: new treatment considerations

**Current Opinion in Critical Care**
October 2015, Volume 21, Issue 5

Understanding central venous pressure: not a preload index?

Arterial blood pressure and heart rate regulation in shock state

Oxygen extraction and perfusion markers in severe sepsis and septic shock: diagnostic, therapeutic and outcome implications

Fluid bolus therapy: monitoring and predicting fluid responsiveness

Monitoring: from cardiac output monitoring to echocardiography
New antibiotics and antimicrobial combination therapy for the treatment of gram-negative bacterial infections

Pharmacokinetic/pharmacodynamic considerations for the optimization of antimicrobial delivery in the critically ill

Fungal infections in the ICU: advances in treatment and diagnosis

Update on ventilator-associated pneumonia

Progress on core outcome sets for critical care research

Describing and measuring recovery and rehabilitation after critical illness

Making sense of clinical outcomes following cardiac arrest

What can acute medicine learn from qualitative methods?

Exploiting big data for critical care research

**Pediatric Anesthesia**
October 2015, Volume 25, Issue 10

Comparison of central venous catheterization techniques in pediatric patients: needle vs angiocath

Is the supraclavicular approach to the central vein still risky and taboo?

**Journal of Pediatrics**
October 2015, Volume 167, Issue 4

Constipation in the Critically Ill Child: Frequency and Related Factors

Pediatricians' Experience with Clinical Ethics Consultation: A National Survey

**American Journal of Respiratory and Critical Care Medicine**
October 2015, Volume 192, Issue 7

A Molecular Biomarker to Diagnose Community-acquired Pneumonia on Intensive Care Unit Admission

**Critical Care**
September 2015, Volume 19

Discordant identification of pediatric severe sepsis by research and clinical definitions in the SPROUT international point prevalence study
Daily estimation of the severity of organ dysfunctions in critically ill children by using the PELOD-2 score

Development of metabolic and inflammatory mediator biomarker phenotyping for early diagnosis and triage of pediatric sepsis

**Acta Paediatrica**
**October 2015, Volume 104, Issue 10**

Inadequate vitamin D levels are associated with culture positive sepsis and poor outcomes in paediatric intensive care

**European Journal of Pediatrics**
**October 2015, Volume 174, Issue 10**

B-type natriuretic peptide as a parameter for pulmonary hypertension in children. A systematic review

Performance of PRISM III and PELOD-2 scores in a pediatric intensive care unit

Comparison of the TruView PCD video laryngoscope and macintosh laryngoscope for pediatric tracheal intubation by novice paramedics: a randomized crossover simulation trial

Analysis of medication prescribing errors in critically ill children

Inherited metabolic disorders presenting as acute liver failure in newborns and young children: King’s College Hospital experience

**Cardiology in the Young**
**October 2015, Volume 25, Issue 7**

Arrhythmias in the paediatric intensive care unit: a prospective study of the rates and predictors of arrhythmias in children without underlying cardiac disease

Safety of therapeutic hypothermia in children on veno-arterial extracorporeal membrane oxygenation after cardiac surgery

Artefactual atrial flutter due to interference from a portable media device

Reversible diaphragmatic paralysis caused by a malpositioned chest tube
Latest relevant Systematic Reviews from the Cochrane Library

Dressings and securement devices for central venous catheters (CVC)

Corticosteroids for acute bacterial meningitis

New activity in Uptodate

Contrast regimens for children requiring abdominal and pelvic computed tomography after blunt trauma (September 2015)

We suggest that hemodynamically stable children undergoing computed tomography (CT) of the abdomen and pelvis after blunt trauma receive intravenous (IV) contrast alone rather than IV and oral contrast. In a multicenter, prospective observational study of over 5000 children undergoing CT with IV contrast, of whom 1010 also received oral contrast, the sensitivity for identifying intraabdominal injury was not significantly different with or without oral contrast (99 versus 98 percent, respectively) [24]. Patients who received oral contrast had a significantly longer delay in undergoing CT (median 12 minutes) compared with children who received IV contrast alone. Thus, oral contrast does not improve detection of intraabdominal injury in children during the initial evaluation of blunt abdominal trauma when compared with IV contrast alone but delays time to imaging. (See "Overview of blunt abdominal trauma in children", section on 'Use of contrast'.)

Upcoming Lunchtime Drop-in Sessions

The Library and Information Service provides free specialist information skills training for all UHBristol staff and students.

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If you’re unable to attend we also provide one-to-one or small group sessions. Contact library@uhbristol.nhs.uk or katie.barnard@uhbristol.nhs.uk to arrange a session.

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Title: Off-label and unlicensed drug use in children admitted to Pediatric Intensive Care Units (PICU).

Citation: The International journal of risk & safety in medicine, Sep 2015, vol. 27, no. 3, p. 113-121 (September 15, 2015)

Author(s): Jobanputra, Neha, Save, Sushma U, Bavdekar, Sandeep B

Abstract: There is paucity of data regarding the use of off-label (OL) and unlicensed drug (UL) use in children admitted to the Pediatric Intensive Care Units (PICUs). To determine prevalence of OL- and UL-drug use in children admitted to PICU. Prospective observational study. PICU in Mumbai (formerly Bombay), India. Consecutive patients aged 28 d-12 yr admitted over 12-mo period. Prescriptions issued to PICU patients were surveyed and demographic data, diagnosis and details of drugs used (dose, frequency, route of administration, indication, and UL use) were noted. Descriptive statistics was used for providing prevalence of OL drug (including category) and UL use. Fisher-Pearson test was used to determine the significance of age, mechanical ventilation and number of systems involved with reference to OL- and UL-drug use. 482 participants received 1789 [OL: 738(41.25%) and UL: 376(21.01%)] drug prescriptions; OL-drug use was highest in infants (56.52%) with indication outside the license (32.37%) being the commonest category of OL-drug use across all age-groups. Unlicensed drug use was entirely due to extemporaneously-prepared drug (EPD) use. The OL drug- and EPD-use were significantly associated with infancy and ventilation therapy. The high prevalence of OL- and UL-drug use in children admitted in the PICU significantly compromises their right to safe drugs. As most of the OL drug use is related to drugs used in children for several years; legislative and regulatory initiatives are required to ensure that accumulated evidence and experience gets incorporated in the license.

Title: Healthcare-associated infections in pediatric intensive care units in Turkey: A national point-prevalence survey

Citation: Japanese Journal of Infectious Diseases, September 2015, vol./is. 68/5(381-386), 1344-6304;1884-2836 (19 Sep 2015)

Author(s): Kepenekli E. et al.

Abstract: Health care-associated infections (HCAIs) cause considerable morbidity and mortality in pediatric intensive care units (PICUs). The objective of this point prevalence study was to assess the burden of HCAIs in PICUs in Turkey. Fifty PICUs participated in this study. Data regarding demographics, microbiological findings, therapeutic interventions, and outcomes were collected for all PICU inpatients. A total of 327 patients participated in the study: 122 (37%) experienced 1 or more HCAI. The most frequently reported site of infection was lower respiratory tract (n=77, 63%). The most frequently isolated pathogens were Pseudomonas aeruginosa, Acinetobacter species, and Candida species. Two hundred and forty-seven patients (75%) were receiving antimicrobial therapy at the time of the survey, and the most frequently administered antimicrobials were third generation cephalosporins. Hospital type, male, PICU stay > 7 days, and mechanical ventilation were found to be independent risk factors for HCAIs. At the 4-week follow up, 43 (13%) patients had died, 28 (65%) of whom died of HCAIs. Endotracheal intubation, urinary catheter, male, and HCAIs were independent risk factors for mortality. This national, multicenter study documented a high prevalence of HCAIs in Turkey. In light of the ‘primum non nocere’ principle, the prevention of these infections should be a priority of public health policy.
**Title:** Impact of infection control training for interns on PICU-acquired bloodstream infections in a middle-income country

**Citation:** Singapore Medical Journal, September 2015, vol./is. 56/9(506-512), 0037-5675 (01 Sep 2015)

**Author(s):** Ng Y.Y., Abdel-Latif M.E.-A., Gan C.S., Siham A., Zainol H., Lum L.C.S.

**Abstract:** INTRODUCTION The present study aimed to determine the impact of an extended infection control training programme, which was conducted for all interns posted to the Department of Paediatrics, on the incidence of paediatric intensive care unit (PICU)-acquired bloodstream infections (BSIs) in University Malaya Medical Centre, Malaysia. METHODS The development of nosocomial BSIs during the baseline period (1 January-31 October 2008) and intervention period (1 November-31 December 2009) was monitored. During the intervention period, all paediatric interns underwent training in hand hygiene and aseptic techniques for accessing vascular catheters. RESULTS A total of 25 patients had PICU-acquired BSIs during the baseline period, while 18 patients had PICU-acquired BSIs during the intervention period (i.e. infection rate of 88 per 1,000 and 41 per 1,000 admissions, respectively). The infections were related to central venous catheters (CVCs) in 22 of the 25 patients who had PICU-acquired BSIs during the baseline period and 11 of the 18 patients who had PICU-acquired BSIs during the intervention period. Thus, the incidence rates of catheter-related BSIs were 25.2 per 1,000 CVC-days and 9.3 per 1,000 CVC-days, respectively (p < 0.05). The Paediatric Risk of Standardised Mortality III score was an independent risk factor for PICU-acquired BSIs and the intervention significantly reduced this risk. CONCLUSION The education of medical interns on infection control, a relatively low-cost intervention, resulted in a substantial reduction in the incidence of PICU-acquired BSIs.

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**Title:** Glucose management in critically ill adults and children

**Citation:** The Lancet Diabetes and Endocrinology, September 2015, vol./is. 3/9(723-733), 2213-8587;2213-8595 (01 Sep 2015)

**Author(s):** Mesotten D., Preiser J.-C., Kosiborod M.

**Abstract:** Blood glucose management in people with acute myocardial infarction and critical illness has always attracted controversy. Compared with the era before 2001 when no attention was given to blood glucose management, DIGAMI-1 in 1995 and the first Leuven study in 2001 showed improved outcomes with strict control of blood glucose, thereby suggesting a causal association between hyperglycaemia and mortality risk. These landmark trials have set the standard in clinical practice that excessive hyperglycaemia is not acceptable. Multicentre trials contradicted the benefits of tight control of patients' blood glucose and results showed that different standard operating procedures for blood glucose control (eg, blood glucose meters or algorithms), divergent concomitant feeding strategies, and varying patient populations are important confounders. The general consensus now is that excessive hyperglycaemia (>10 mmol/L) and severe hypoglycaemia (<2.2 mmol/L) should be avoided in critically ill adults. If adequate blood glucose meters and clinically validated protocols for insulin-dosing are available, targeting of blood glucose concentrations to less than 8 mmol/L (moderate glycaemic control), while avoiding mild hypoglycaemia (<3.9 mmol/L), is a reasonable strategy in adult patients who are critically ill. This recommendation is not based on findings from randomised controlled trials, but merely represents a very common, pragmatic approach by physicians at the bedside. As a result of the few properly validated technologies for tighter blood glucose control, targeting blood glucose concentrations to less than 6 mmol/L is not recommended, because its risk-to-benefit ratio becomes questionable. Because blood glucose control in the target of adult ranges does not improve patient outcomes for children in the intensive care unit, glucose management in this patient population should be limited to avoid excessive hyperglycaemia (>10 mmol/L).

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**Title:** An Updated Therapeutic Intervention Scoring System for Critically Ill Children Enables Nursing Workload Assessment with Insight into Potential Untoward Events

**Citation:** Journal of Intensive Care Medicine, September 2015, vol./is. 30/6(344-350), 0885-0666;1525-1489 (19 Sep 2015)
**Author(s):** Trope R., Vaz S., Zinger M., Sagy M.

**Abstract:** Background: To introduce an updated version of the original Therapeutic Intervention Scoring System (TISS) applicable to critically ill children (TISS-C). This version was designed to assess patient acuity and nursing workload (NW) and to determine a relationship between such assessment and the incidence of adverse events. Methods: Reviewing previous versions of TISS, an updated TISS-C was developed. Items inapplicable to pediatric critical care were eliminated; items current to critical care were added; and items still valid were edited. The point system accounts for the wide range of care provided. Random patients from a predetermined period had TISS-C scores calculated. The TISS-C scores were also calculated on patients with documented adverse events. Baseline scores were compared with scores of patients in whom adverse events had occurred. We determined the pediatric intensive care unit (PICU) NW to be the product of the TISS-C score and the patient-nurse ratio (PNR). Results: One hundred twenty-five random patients had a mean TISS-C of 14.6 +/- 11.8. Patients with any adverse event (98) had a TISS-C of 19.9 +/- 11.6 (P <.05). Using our PICU mean PNR of 1.4 (20 patients/14 nurses), the NW for patients with more severe events was 33.6 +/- 15.9. Conclusions: Critically ill pediatric patients are more vulnerable to experience adverse events when their derived NW values are high. It is postulated that a critical NW exists, where adverse events are more likely to occur.

**Title:** Non-invasive ventilation is useful in paediatric intensive care units if children are appropriately selected and carefully monitored

**Citation:** Acta Paediatrica, International Journal of Paediatrics, September 2015, vol./is. 104/9(861-871), 0803-5253;1651-2227 (01 Sep 2015)

**Author(s):** Demaret P., Mulder A., Loeckx I., Trippaerts M., Lebrun F.

**Abstract:** Non-invasive ventilation (NIV) is commonly used in paediatric intensive care units (PICUs) for respiratory failure. This review aims to improve paediatricians' understanding of NIV, by specifying technical or practical considerations, giving advice about selecting patients and presenting pertinent published data about NIV in different circumstances. Conclusion NIV is useful in PICUs if children are appropriately selected and carefully monitored. Technological advances and future clinical research will improve its use and success rate in PICU.

**Title:** Severe enterovirus 68 respiratory illness in children requiring intensive care management

**Citation:** Journal of Clinical Virology, September 2015, vol./is. 70/(77-82), 1386-6532;1873-5967 (01 Sep 2015)

**Author(s):** Schuster J.E., Miller J.O., Selvarangan R., Weddle G., Thompson M.T., Hassan F., Rogers S.L., Oberste M.S., Nix W.A., Jackson M.A.

**Abstract:** Background: Enterovirus 68 (EV-D68) causes acute respiratory tract illness in epidemic cycles, most recently in Fall 2014, but clinical characteristics of severe disease are not well reported. Objectives: Children with EV-D68 severe respiratory disease requiring pediatric intensive care unit (PICU) management were compared with children with severe respiratory disease from other enteroviruses/rhinoviruses. Study design: A retrospective review was performed of all children admitted to Children’s Mercy Hospital PICU from August 1-September 15, 2014 with positive PCR testing for enterovirus/rhinovirus. Specimens were subsequently tested for the presence of EV-D68. We evaluated baseline characteristics, symptomatology, lab values, therapeutics, and outcomes of children with EV-D68 viral infection compared with enterovirus/rhinovirus-positive, EV-D68-negative children. Results: A total of 86 children with positive enterovirus/rhinovirus testing associated with respiratory symptoms were admitted to the PICU. Children with EV-D68 were older than their EV-D68-negative counterparts (7.1 vs. 3.5 years, P=. 0.01). They were more likely to have a history of asthma or recurrent wheeze (68% vs. 42%, P=. 0.03) and to present with cough (90% vs. 63%, P= .009). EV-D68 children were significantly more likely to receive albuterol (95% vs. 79%, P=. 0.04), magnesium (75% vs. 42%, P=. 0.004), and aminophylline (25% vs. 4%, P=. 0.03). Other adjunctive medications used in EV-D68 children included
corticosteroids, epinephrine, and heliox; 44% of EV-D68-positive children required non-invasive ventilatory support. Conclusions: EV-D68 causes severe disease in the pediatric population, particularly in children with asthma and recurrent wheeze; children may require multiple adjunctive respiratory therapies.

**Title:** Implementation of a Standard Verbal Sign-Out Template Improves Sign-Out Process in a Pediatric Intensive Care Unit.

**Citation:** Journal for healthcare quality : official publication of the National Association for Healthcare Quality, Sep 2015, vol. 37, no. 5, p. 267-276 (2015 Sep-Oct)

**Author(s):** Bavare, Aarti C, Shah, Pankil K, Roy, Kevin M, Williams, Eric A, Lloyd, Linda E, McPherson, Mona L

**Abstract:** Sign-out of patient data at change of shifts is vulnerable to errors that impact patient safety. Although sign-outs are complex in intensive care units (ICU), a paucity of studies exists evaluating optimal ICU sign-out. Our prospective interventional study investigated the use of a standard verbal template in a Pediatric ICU to improve the sign-out process. We designed and validated a survey tool to measure 10 items of optimal sign-out. The survey and analysis of sign-out information exchanged was performed pre- and postintervention. Forty-eight clinicians participated, with a survey response rate of 88% and 81% in the pre- and postintervention phases, respectively. Seventy-nine percent clinicians identified the need for sign-out improvement. Clinician satisfaction with sign-out increased postintervention (preintervention survey scores: 3.26 (CI: 3.09-3.43), postintervention 3.9 (CI: 3.76-4.04) [p < .01]). Three scorers analyzed the verbal and written sign-out content with good inter-rater reliability. After the intervention, sign-out content revealed increased patient identification, background description, account of system-based clinical details [p = .001] and notation of clinical details, code status, and goals [p < .002]. Interruptions decreased [p = .04] without any change in sign-out duration [p = .86]. The standard verbal template improved clinician satisfaction with sign-out, augmented the amount of information transferred and decreased interruptions without increasing the duration of sign-out.

**Title:** The pH of Feeding Tube Aspirates From Critically Ill Infants.

**Citation:** American journal of critical care : an official publication, American Association of Critical-Care Nurses, Sep 2015, vol. 24, no. 5, p. e72. (September 2015)

**Author(s):** Meert, Kathleen L, Caverly, Mary, Kelm, Lauren M, Metheny, Norma A

**Abstract:** The extent to which gastric acid inhibitors and feedings affect gastric pH in infants is unclear. To compare pH values of gastric aspirates from infants according to use or no use of gastric acid inhibitors and feedings. Colorimetric pH tests were used to measure the pH of aspirates from feeding tubes in 54 critically ill infants; 29 of the gastric aspirates were from infants who did not receive acid inhibitors or feedings, 13 were from infants who received acid inhibitors but no feedings, 3 were from infants who received feedings but no acid inhibitors, and 5 were from infants who received both acid inhibitors and feedings. The remaining 4 feeding tubes were in nongastric sites. Individual pH readings of 5.5 or less were found in 97% of the gastric aspirates from infants with no recent feedings or acid inhibitors, 77% of the gastric aspirates from infants who received acid inhibitors but no feedings, 3 were from infants who received feedings but no acid inhibitors, and 5 were from infants who received both acid inhibitors and feedings. The remaining 4 feeding tubes were in nongastric sites. Individual pH readings of 5.5 or less were found in 97% of the gastric aspirates from infants with no recent feedings or acid inhibitors, 77% of the gastric aspirates from infants who received acid inhibitors, and 67% of the gastric aspirates from infants with recent feedings. Among 2 esophageal aspirates and 2 duodenal aspirates, 1 of each type had a pH less than 5.5. A pH cut point of 5.5 or less did not rule out esophageal or duodenal placement. The pH of gastric aspirates from critically ill infants is often 5.5 or less, regardless of the use of acid inhibitors, feedings, or both. Most likely a cut point of 5.5 or less would rule out respiratory placement because tracheal pH is typically 6.0 or higher. ©2015 American Association of Critical-Care Nurses.

**Title:** Promoting Staff Resilience in the Pediatric Intensive Care Unit.

**Citation:** American journal of critical care : an official publication, American Association of Critical-Care Nurses, Sep 2015, vol. 24, no. 5, p. 422-430 (September 2015)
**Author(s):** Lee, K Jane, Forbes, Michael L, Lukasiewicz, Gloria J, Williams, Trisha, Sheets, Anna, Fischer, Kay, Niedner, Matthew F

**Abstract:** Health care professionals experience workplace stress, which may lead to impaired physical and mental health, job turnover, and burnout. Resilience allows people to handle stress positively. Little research is aimed at finding interventions to improve resilience in health care professionals. To describe the availability, use, and helpfulness of resilience-promoting resources and identify an intervention to implement across multiple pediatric intensive care units. A descriptive study collecting data on availability, utilization, and impact of resilience resources from leadership teams and individual staff members in pediatric intensive care units, along with resilience scores and teamwork climate scores. Leadership teams from 20 pediatric intensive care units completed the leadership survey. Individual surveys were completed by 1066 staff members (51% response rate). The 2 most used and impactful resources were 1-on-1 discussions with colleagues and informal social interactions with colleagues out of the hospital. Other resources (taking a break from stressful patients, being relieved of duty after your patient’s death, palliative care support for staff, structured social activities out of hospital, and Schwartz Center rounds) were highly impactful but underused. Utilization and impact of resources differed significantly between professions, between those with higher versus lower resilience, and between individuals in units with low versus high teamwork climate. Institutions could facilitate access to peer discussions and social interactions to promote resilience. Highly impactful resources with low utilization could be targets for improved access. Differences in utilization and impact between groups suggest that varied interventions would be necessary to reach all individuals. ©2015 American Association of Critical-Care Nurses.

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**Title:** Sex differences in children with severe health conditions: Causes of admission and mortality in a Pediatric Intensive Care Unit.

**Citation:** American journal of human biology : the official journal of the Human Biology Council, Sep 2015, vol. 27, no. 5, p. 613-619 (September 10, 2015)

**Author(s):** Esteban, Elisabeth, Bujaldon, Esther, Esparza, Mireia, Jordan, Iolanda, Ionlada, Espeban, María Esther

**Abstract:** Based on the existing sex differences in mortality rates in children, we would like to explore whether girls and boys respond differently under severe health conditions, in terms of mortality and cause of admission. We analyzed demographic characteristics (age and sex), causes of admission, clinical parameters, and mortality in a sample of 2,609 patients from a Pediatric Intensive Care Unit (PICU) in a children’s hospital in Barcelona, Spain. PICU admittance was significantly higher in boys (57.5% vs. 42.5%) whereas PICU mortality was significantly higher in girls (4.9% vs. 3.3%). Female sex was a risk factor for PICU in-hospital mortality (OR = 1.55, P = 0.033), while increasing age had a protective effect (OR = 0.808, P = 0.021). In cases of PICU mortality, girls died from a broader range of causes and boys were more affected by respiratory and polytraumatic injuries. Boys were affected by polytraumatic injuries throughout the year, less frequently in winter, while girls showed a higher occurrence in holiday months. Although more boys were admitted to the PICU, a significantly higher number of girls died. Younger age and higher occurrence of nosocomial infection among girls could explain this finding. More frequent polytraumatic injuries in boys could reflect an increased exposure to risky activities and/or more careless behavior. Am. J. Hum. Biol. 27:613-619, 2015. © 2015 Wiley Periodicals, Inc. © 2015 Wiley Periodicals, Inc.

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**Title:** Non-invasive ventilation is useful in paediatric intensive care units if children are appropriately selected and carefully monitored.

**Citation:** Acta paediatrica (Oslo, Norway : 1992), Sep 2015, vol. 104, no. 9, p. 861-871 (September 2015)

**Author(s):** Demaret, Pierre, Mulder, André, Loeckx, Isabelle, Trippaerts, Marc, Lebrun, Frédéric

**Abstract:** Non-invasive ventilation (NIV) is commonly used in paediatric intensive care units (PICUs) for respiratory failure. This review aims to improve paediatricians’ understanding of NIV, by specifying technical or practical considerations, giving advice about selecting patients and presenting pertinent published data about
**Title:** Impact of Noise on Nurses in Pediatric Intensive Care Units.

**Citation:** American journal of critical care : an official publication, American Association of Critical-Care Nurses, Sep 2015, vol. 24, no. 5, p. 377-384 (September 2015)

**Author(s):** Watson, J'ai, Kinstler, Angela, Vidonish, William P, Wagner, Michael, Lin, Li, Davis, Kermit G, Kotowski, Susan E, Daraiseh, Nancy M

**Abstract:** Excessive exposure to noise places nurses at risk for safety events, near-misses, decreased job performance, and fatigue. Noise is particularly a concern in pediatric intensive care units, where highly skilled providers and vulnerable patients require a quiet environment to promote healing. To measure noise levels and noise duration on specialty pediatric intensive care units to explore sources of noise and its effects on the health of registered nurses. In a cross-sectional pilot study, levels and sources of noise in 3 different specialty pediatric intensive care units were assessed. Fifteen nurses were observed for 4-hour sessions during a 24-hour period. Sound pressure levels (noise) and heart rate were measured continuously, and stress ratings were recorded. Descriptive statistics were calculated for noise (level, source, location, and activity), heart rate, and stress. The Pearson correlation coefficient was calculated to analyze the relationship between heart rate and noise. Mean noise level was 71.9 (SD, 9.2) dBA. Mean heart rate was 85.2/min (SD, 15.8/min) and was significantly associated with noise, unit, within-unit location, nurse sources, and noise activities. The most frequent sources of noise were patients' rooms, care activities, and staff communications. Noise levels in pediatric intensive care units exceed recommended thresholds and require immediate attention through effective interventions. Although noise was not associated with stress, a significant correlation with increased heart rate indicates that noise may be associated with adverse health outcomes. ©2015 American Association of Critical-Care Nurses.

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**Title:** Impact of Contact Isolation Precautions on Multi-Drug Resistant Acinetobacter baumannii in the Pediatric Intensive Care Unit.

**Citation:** Infection control and hospital epidemiology, Sep 2015, vol. 36, no. 9, p. 1108-1110 (September 2015)

**Author(s):** Tawney, Adam, Semproch, Lynn, Lephart, Paul, Valentine, Kevin, Thomas, Ronald, Asmar, Basim I, Chopra, Teena, McGrath, Eric J

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**Title:** Implementation of smart pump technology in a paediatric intensive care unit.

**Citation:** Health informatics journal, Sep 2015, vol. 21, no. 3, p. 209-222 (September 2015)

**Author(s):** Manrique-Rodríguez, Silvia, Sánchez-Galindo, Amelia C, de Lorenzo-Pinto, Ana, González-Vives, Leticia, López-Herce, Jesús, Carrillo-Álvarez, Ángel, Sanjurjo-Sáez, Maria, Fernández-Llamazares, Cecilia M

**Abstract:** Patient safety is a matter of major concern that involves every health professional. Nowadays, emerging technologies such as smart pumps can diminish medication errors as well as standardise and improve clinical practice with the subsequent benefits for patients. The aim of this paper was to describe the smart pump implementation process in a paediatric intensive care unit (PICU) and to present the most relevant infusion-related programming errors that were prevented. This was a comparative study between CareFusion Alaris Guardrails(*) and Hospira MedNet(*) systems, as well as a prospective and intervention study with analytical components carried out in the PICU of Gregorio Marañón General and Teaching Hospital. All intravenous infusions programmed with a pump in the eleven beds of the unit were analyzed. A drug library was developed and subsequently loaded into CareFusion and Hospira pumps that were used during a three month period each. The most suitable system for implementation was selected according to their differences.
in features and users' acceptance. Data stored in the pumps were analyzed to assess user compliance with the technology, health care setting and type of errors intercepted. The implementation process was carried out with CareFusion systems. Compliance with the technology was 92% and user acceptance was high. Vacation substitution and drug administration periods were significantly associated with a greater number of infusion-related programming errors. High risk drugs were involved in 48% of intercepted errors. Based on these results we can conclude that implementation of smart pumps proved effective in intercepting infusion-related programming errors from reaching patients. User awareness of the importance of programming infusions with the drug library is the key to succeed in the implementation process. © The Author(s) 2013.

Title: High-flow nasal cannula use in a paediatric intensive care unit over 3 years.

Citation: Critical care and resuscitation : journal of the Australasian Academy of Critical Care Medicine, Sep 2015, vol. 17, no. 3, p. 197-201, 1441-2772 (September 2015)

Author(s): Wraight, Tracey I, Ganu, Subodh S

Abstract: High-flow nasal cannula (HFNC) therapy is increasingly used in paediatric intensive care unit (PICU) patients, despite a paucity of studies. We describe its use over the 3 years since its implementation in our tertiary intensive care unit. The clinical database was used to identify PICU patients on HFNC therapy from 2011 to 2013. Patients were assessed for risk factors, underlying diagnosis, viral test results and cardiorespiratory parameters before and after HFNC therapy. Fifty-four children were included with a median age of 3.5 months (interquartile range [IQR], 1-10 months) and 59% were females. The commonest diagnosis was bronchiolitis (79%). HFNC therapy was successful in 78% of patients and failed for 12 (seven patients went on to CPAP treatment and five were intubated). The median time to HFNC therapy failure was 5.5 hours (IQR, 3.6-9 hours), with 75% of patients experiencing therapy failure by 8.25 hours. The failure rate was 50% in children with a primary diagnosis of congenital heart disease. There was a statistically significant difference between the mean respiratory rate at 1 hour in the success and failure groups (P = 0.037), despite similar respiratory rates at onset. HFNC therapy failure was associated with a longer PICU LOS (P = 0.04). HFNC therapy was successful in most patients. Most failures occurred within 8.25 hours. Use of HFNC for heart disease was associated with a high therapy failure rate (50%).

Title: New Insights Into Multicenter PICU Mortality Among Pediatric Hematopoietic Stem Cell Transplant Patients.

Citation: Critical care medicine, Sep 2015, vol. 43, no. 9, p. 1986-1994 (September 2015)

Author(s): Zinter, Matt S, Dvorak, Christopher C, Spicer, Aaron, Cowan, Morton J, Sapru, Anil

Abstract: Over 2,500 children undergo hematopoietic stem cell transplantation in the United States each year, and up to 35% require PICU support for life-threatening complications. PICU mortality has dropped from 85% to 44%, but interpretation is confounded by significant cohort heterogeneity. Reports conflict regarding outcomes for patients with different underlying hematopoietic stem cell transplantation indications, and the burden of infectious complications for these patients has not been evaluated. We aim to describe infections, critical care interventions, and mortality for pediatric hematopoietic stem cell transplantation patients requiring PICU admission. A retrospective multicenter cohort analysis. One hundred twelve centers in the Virtual PICU Systems database, January 1, 2009, to June 30, 2012. A total of 1,782 admissions for patients who are 21 years old or younger with prior hematopoietic stem cell transplantation. None. Pediatric Index of Mortality-2, Pediatric Risk of Mortality-3, transplant indication, infections, interventions, and mortality were recorded from admission through PICU death or discharge. Pediatric hematopoietic stem cell transplantation patients comprised 0.7% of all PICU admissions (1,782/246,346), which resulted in 16.2% mortality compared with 2.4% mortality for non-hematopoietic stem cell transplantation admissions (odds ratio, 7.8; 95% CI, 6.8-8.8; p < 0.001). Mortality for admissions with underlying hematologic malignancy (22.7%) was similar to that of admissions with primary immunodeficiency (19.4%; p = 0.41) but significantly greater than admissions with underlying nonmalignant non-primary immunodeficiency hematologic disease (15.4%; p = 0.020), metabolic disorder (8.1%; p < 0.001), or solid malignancy (5.7%; p < 0.001). Infection was documented in 45.7% of
admissions with 22.2% mortality; viral and fungal mortality were 28.5% and 33.7%, respectively. Invasive positive pressure ventilation and renal replacement therapy were used in only 34.6% and 11.9% of admissions, with mortality of 42.5% and 51.9%, respectively. PICU mortality for pediatric hematopoietic stem cell transplantation patients may be as low as 16.2% but higher for those receiving intubation (42.5%) or replacement therapy (51.9%). Hematologic malignancy and primary immunodeficiency had greater risk for mortality than other transplant indications. Greater understanding of other risk factors affecting mortality and the need for critical care support is needed.

**Full Text:**
Available from *Ovid* in *Critical Care Medicine*

**Title:** Pediatric Palliative Care in the Intensive Care Unit.

**Citation:** Critical care nursing clinics of North America, Sep 2015, vol. 27, no. 3, p. 341-354 (September 2015)

**Author(s):** Madden, Kevin, Wolfe, Joanne, Collura, Christopher

**Abstract:** The chronicity of illness that afflicts children in Pediatric Palliative Care and the medical technology that has improved their lifespan and quality of life make prognostication extremely difficult. The uncertainty of prognostication and the available medical technologies make both the neonatal intensive care unit and the pediatric intensive care unit locations where many children will receive Pediatric Palliative Care. Health care providers in the neonatal intensive care unit and pediatric intensive care unit should integrate fundamental Pediatric Palliative Care principles into their everyday practice. Copyright © 2015 Elsevier Inc. All rights reserved.

**Title:** Family-centred care and traumatic symptoms in parents of children admitted to PICU

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**Author(s):** Mortensen, Jesper, Simonsen, Birgitte Olesen, Eriksen, Sara Bek

**Abstract:** Background: Studies show that traumatic stress symptoms are common in parents of children admitted to the pediatric intensive care unit (PICU). Family-centred care (FCC) has shown promising potential in reducing levels of traumatic stress in this group of parents. Objectives: To investigate the association between parents’ experience of nursing care and levels of traumatisation, to identify potential gender differences within this group, and to examine the possible relationships among the severity of a child’s illness, the parents’ fear of losing their child, and the parents’ experience of support and development of acute stress disorder (ASD) symptoms. Ethical issues/approval: This study was approved by The Central Denmark Regional Committee on Health Research Ethics and by the Danish Data Agency (#1-16-02-87-11) and data were stored, protected and destroyed according to their regulations. Methodology/design: This cross-sectional study involved 90 parents of children admitted to PICU at the University Hospital of Aarhus from August 2011 to August 2012. The parents filled out a self-report questionnaire package at the time of their child’s discharge from the hospital. Results: The experience of support from the nurses was high in both parents and was associated with ASD. About one-third of the parents had ASD or subclinical ASD. No significant gender differences existed when symptoms were measured dimensionally. When measured categorically, 17% of the mothers and 7% of the fathers had ASD. Mothers with very young children had higher levels of acute stress; fathers whose children had high illness severity scores exhibited more acute stress. Study limitations: Limitations have been identified in relation to the sample size of the study, the cross-sectional design and the short amount of time the families were in contact with PICU. Conclusion: The fathers and mothers were very pleased with the perceived care at the unit. The experienced care was positively associated with acute stress, but not with illness severity, or fear of losing the child. More research is needed to understand the dynamics of family-centred care. [PUBLICATION] 13 references
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