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.

Critical Appraisal Training

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
1: Tables of Contents from January’s Paediatric journals

2: New NICE Guidance

3: Latest relevant Systematic Reviews from the Cochrane Library

4: NHS Behind the Headlines

5: New activity in Uptodate

6: Quick Exercise

7: Current Awareness database articles
Paediatric Critical Care Medicine
January 2016, Volume 17, Issue 1

Pediatric Critical Care Medicine 2016: Growth and Further Specialization
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Foreword

The Pediatric Risk of Mortality Score: Update 2015*
Pollack, Murray M et al.

Worldwide Survey of Nutritional Practices in PICUs*
Kerklaan, Dorian; Fivez, Tom; Mehta, Nilesh M.; Mesotten, Dieter; van Rosmalen, Joost; Hulst, Jessie M.; Van den Berghe, Greet; Joosten, Koen F. M.; Verbruggen, Sascha C. A. T.

Patterns of Sedation Weaning in Critically Ill Children Recovering From Acute Respiratory Failure*
Best, Kaitlin M.; Asaro, Lisa A.; Franck, Linda S.; Wypij, David; Curley, Martha A. Q.; for the Randomized Evaluation of Sedation Titration for Respiratory Failure Baseline Study Investigators

Intraoperative Steroid Use and Outcomes Following the Norwood Procedure: An Analysis of the Pediatric Heart Network’s Public Database
Elhoff, Justin J.; Chowdhury, Shahryar M.; Zyblewski, Sinai C.; Atz, Andrew M.; Bradley, Scott M.; Graham, Eric M.

A Cross-Sectional Survey of Near-Infrared Spectroscopy Use in Pediatric Cardiac ICUs in the United Kingdom, Ireland, Italy, and Germany*
Hoskote, Aparna U.; Tume, Lyvonne N.; Trieschmann, Uwe; Menzel, Christoph; Cogo, Paola; Brown, Katherine L.; Broadhead, Michael W.

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Kaskinen, Anu K.; Helve, Otto; Andersson, Sture; Kirjavainen, Turkka; Martelius, Laura; Mattila, Ilkka P.; Rautiainen, Paula; Pitkänen, Olli M.

ICU-Acquired Weakness Is Associated With Differences in Clinical Outcomes in Critically Ill Children*
Field-Ridley, Aida; Dharmar, Madan; Steinhorn, David; McDonald, Craig; Marcin, James P.
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Cifra, Christina L.; Bembea, Melania M.; Fackler, James C.; Miller, Marlene R.

The Morbidity and Mortality Conference in Pediatric Intensive Care as a Means for Improving Patient Safety
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Beardsley, Andrew L.; Nitu, Mara E.; Cox, Elaine G.; Benneyworth, Brian D.

Insights From Multi-Dimensional Physiological Signals to Predict and Prevent Cardiac Arrests*
Eytan, Danny; Goodwin, Andrew; Laussen, Peter; Guerguerian, Anne-Marie

Severity-of-Illness Scoring in Pediatric Critical Care: Quo Vadis?*
Tasker, Robert C.; Randolph, Adrienne G.

Enteral Nutrition in PICUs: Mission Not Impossible!*
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February 2016, Volume 28, Issue 1

Recent progress and new challenges in pediatric infectious disease
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Just when you think you know someone: the evolving epidemiologies of measles and pertussis
Zahn, Matt

Enteroviruses in the early 21st century: new manifestations and challenges
Lugo, Debra; Krogstad, Paul

Current Opinion in Critical Care
February 2016, Volume 22, Issue 1

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February 2016, Volume 26, Issue 2

Respiratory variation in aortic blood flow peak velocity to predict fluid responsiveness in mechanically ventilated children: a systematic review and meta-analysis (pages 37–47)
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Ross J. Langley, Jillian McFadzean and Jon McCormack

Journal of Pediatrics
January 2016, Volume 168, Issue 1

Intravenous Hydralazine in Hospitalized Children and Adolescents with Hypertension
Joseph T. Flynn, Miranda C. Bradford, Eric M. Harvey
DOI: http://dx.doi.org/10.1016/j.jpeds.2015.07.070
p88–92

Factors Associated with Respiratory Illness in Children and Young Adults with Cerebral Palsy
Amanda Marie Blackmore, Natasha Bear, Eve Blair, Noula Gibson, Caris Jalla, Katherine Langdon, Lisa Moshovis, Kellie Steer, Andrew C. Wilson
DOI: http://dx.doi.org/10.1016/j.jpeds.2015.09.064
p151–157.e1
Published online: October 28 2015

Dopamine increases mortality in pediatric septic shock
Paul E. Marik
DOI: http://dx.doi.org/10.1016/j.jpeds.2015.10.073
p253–256
Published in issue: January 2016

American Journal of Respiratory and Critical Care Medicine
January 2016, Volume 193, Issue 1

A Multicenter Randomized Trial of Continuous versus Intermittent β-Lactam Infusion in Severe Sepsis
Extremely elevated C-reactive protein levels are associated with unfavourable outcomes, including death, in paediatric patients (pages e17–e21)
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Delayed Rapid Response Team Activation Is Associated With Increased Hospital Mortality, Morbidity, and Length of Stay in a Tertiary Care Institution*
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Population Pharmacokinetics of Fentanyl in the Critically Ill*
Choi, Leena et al.

Important knowledge for parents of children with heart disease: parent, nurse, and physician views
Joshua Daily, FitzGerald Mike, Downing Kimberly, King Eileen, del Rey Javier Gonzalez, Ittenbach Richard, Marino Bradley

Procedural characteristics and adverse events in diagnostic and interventional catheterisations in paediatric and adult CHD: initial report from the IMPACT Registry

The effect of milrinone on right and left ventricular function when used as a rescue therapy for term infants with pulmonary hypertension
Adam T. James, Corcoran John D., McNamara Patrick J., Franklin Orla, El-Khuffash Afif F.

Recombinant tissue plasminogen activator as a novel treatment option for infective endocarditis: a retrospective clinical study in 32 children
Aviva Levitas, Krymko Hanna, Richardson Justin, Zalzstein Eli, Ioffe Viktoriya
Ventricular tachycardia in a child with diabetic ketoacidosis without heart disease
Megan McGreevy, Beerman Lee, Arora Gaurav

CHD associated with syndromic diagnoses: peri-operative risk factors and early outcomes
Benjamin J. Landis, Cooper David S., Hinton Robert B.

Other Articles

New England Journal of Medicine

Viral Bronchiolitis in Children
H. Cody Meissner

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European Journal of Pediatrics
December 2015, Volume 174, Issue 12

Critical Care
January 2016, Volume 20

Pediatrics
January 2016, Volume 137, Issue 1
## New Nice Guidance

| NG29 | Intravenous fluid therapy in children and young people in hospital |

## Latest relevant Systematic Reviews from the Cochrane Library

- Non-pharmacological interventions for depression in adults and children with traumatic brain injury
- EEG for children with complex febrile seizures
- Non-pharmacological management of infant and young child procedural pain

## NHS Behind the Headlines

### Our news predictions for 2016

Thursday Dec 31 2015

What will be the big health news stories for 2016? We take a look in the Behind the Headlines crystal ball and offer our predictions...

### Last line in antibiotic resistance under threat - News update

Tuesday Dec 22 2015

"The last line of antibiotic defence against some serious infections is under threat," The Guardian reports, after researchers found that E.coli bacteria from food products in China has developed resistance to colistin, a polymixin antibiotic...

### Researchers investigate the 'pathways of pain'

Monday Dec 7 2015

"Breakthrough could lead to 'super painkillers'," the Mail Online reports. Researchers have investigated a particular sodium channel that plays a key role in transmitting pain signals along sensory nerves to the brain...
New activity in Uptodate

Recombinant von Willebrand factor (October 2015, Modified December 2015)

Patients with von Willebrand disease (VWD) may require von Willebrand factor (VWF) replacement therapy for serious bleeding or surgery. A recombinant VWF product has now been tested in patients with VWD during bleeding episodes and found to be highly effective in restoring hemostasis [47]. Adverse effects were minor, and the half-life of the product is longer than that of plasma-derived concentrates. This product was approved by the United States Food and Drug Administration in December 2015 [48]. (See "Treatment of von Willebrand disease", section on 'VWF preparations'.)

OpenAthens de-mystified...

What is OpenAthens?
OpenAthens is a way of authenticating that you have permission to access our subscription e-resources. To access our electronic resources you will need a UH Bristol Athens username/password.

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My Athens account has expired. What should I do?
You can register for a new account here.

I have forgotten my Athens Username / Password. How can I reset it?
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Username and password: You should email athens.sdhct@nhs.net with your full name, full work address, work telephone number and the email address you used to register for the account. In the email subject line put 'Forgotten username and password'. It may take up to five working days to receive your username and a reset password.
Quick Exercise

Match the diagrams to the corresponding research designs.

1. A: Randomised Controlled Trial
   - Group of interest (e.g. smokers)
   - Follow over time
   - Comparison group (e.g. non-smokers)
   - Follow over time
   - Compare outcomes

2. B: Cohort Study
   - Treatment Group
   - Random assignment
   - Control Group
   - Follow-up
   - Compare results

3. C: Case-control Study
   - Group of interest (e.g. cancer patients)
   - Take histories
   - Compare histories
   - Draw conclusions
   - Comparison group (e.g. non-patients)
   - Take histories

Find out more about research designs in one of our Understanding Articles training sessions. For more details, email library@uhbristol.nhs.uk.
**Title:** Transcranial Doppler Sonography in Pediatric Neurocritical Care: A Review of Clinical Applications and Case Illustrations in the Pediatric Intensive Care Unit.

**Citation:** Journal of ultrasound in medicine : official journal of the American Institute of Ultrasound in Medicine, Dec 2015, vol. 34, no. 12, p. 2121-2132 (December 2015)

**Author(s):** LaRovere, Kerri L, O'Brien, Nicole F

**Abstract:** Transcranial Doppler sonography is a noninvasive, real-time physiologic monitor that can detect altered cerebral hemodynamics during catastrophic brain injury. Recent data suggest that transcranial Doppler sonography may provide important information about cerebrovascular hemodynamics in children with traumatic brain injury, intracranial hypertension, vasospasm, stroke, cerebrovascular disorders, central nervous system infections, and brain death. Information derived from transcranial Doppler sonography in these disorders may elucidate underlying pathophysiologic characteristics, predict outcomes, monitor responses to treatment, and prompt a change in management. We review emerging applications for transcranial Doppler sonography in the pediatric intensive care unit with case illustrations from our own experience. © 2015 by the American Institute of Ultrasound in Medicine.

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**Title:** Paroxysmal Sympathetic Hyperactivity in Critically Ill Children with Encephalitis and Meningoencephalitis.

**Citation:** Neurocritical care, Dec 2015, vol. 23, no. 3, p. 380-385 (December 2015)

**Author(s):** Farias-Moeller, Raquel, Carpenter, Jessica L, Dean, Nathan, Wells, Elizabeth M

**Abstract:** Autonomic dysfunction in pediatric patients with acquired brain injury is often encountered and greatly understudied. We sought to identify the incidence of Paroxysmal Sympathetic Hyperactivity (PSH) in critically ill pediatric patients with meningoencephalitis and encephalitis, associated risk factors and influence on outcome. Children admitted to the pediatric intensive care unit (PICU) with a diagnosis of meningoencephalitis and/or encephalitis were identified from a single institution Neurocritical Care database. The patients were stratified as having a bacterial or non-bacterial cause of their meningoencephalitis/encephalitis. Data from their hospitalization was supplemented with a retrospective review of the electronic medical record. PSH was defined as episodic lability in heart rate and/or blood pressure, hyperthermia, diaphoresis, dystonic posturing, tachypnea and/or agitation without any other cause. Statistical analysis was performed using t-test and chi-squared to compare outcomes and risk factors between patients with PSH and without. PSH was found in 41 % of children studied. Subgroup analysis revealed patients with non-bacterial encephalitis were more likely to experience PSH (51 %) as compared to those with bacterial causes (27 %). Fever and/or seizures on presentation and female gender were associated with higher occurrence of PSH but only in the non-bacterial etiology group. There were trends toward increased length of PICU and overall hospital stay for patients with PSH. PSH was found in a high percentage of our patients with significant variation in risk factors and outcome noted between patients with bacterial and nonbacterial causes of their meningoencephalitis/encephalitis.
Title: Frequency and Mortality Associated with Hyperglycemia in Critically Ill Children.

Citation: Journal of the College of Physicians and Surgeons--Pakistan : JCPSP, Dec 2015, vol. 25, no. 12, p. 878-881 (December 2015)

Author(s): Khan, Sabeen Abid, Ibrahim, Mohsina Noor, Anwar-Ul-Haq

Abstract: To determine the frequency of hyperglycemia in critically ill children admitted in PICU of a tertiary care hospital of Karachi and to compare the mortality of critically ill children with and without hyperglycemia. Cross-sectional study. Paediatrics Intensive Care Unit (PICU) of National Institute of Child Health (NIC), Karachi, from November 2011 to April 2012. One hundred fifty critically ill children admitted to PICU were included. Patients who had fasting blood sugar levels more than 126 mg/dl within 48 hours of admission were included in the hyperglycemic group. The normoglycemic and hyperglycemic groups were followed till 10 days to determine the mortality associated with hyperglycemia. Out of 150 patients, 82 (54.7%) had hyperglycemia. Mortality rate was 48.7% (n=73/150). However, mortality rate was significantly high 57.3% (n=47) in hyperglycemic patients than non-hyperglycemic patients (p=0.019). The presence of stress-induced hyperglycemia in critically ill patients is a well established marker of poor outcome, and a very high mortality rate. Normoglycemia was associated with favorable outcomes in terms of hospital stay and mortality.

Title: Rising to the challenge of preventing pediatric intensive care unit admissions.

Citation: Journal of critical care, Dec 2015, vol. 30, no. 6, p. 1413-1414 (December 2015)

Author(s): Mandell, Iris M, Bynum, Francine, Marshall, Lori, Bart, Robert, Gold, Jeffrey I, Rubin, Sarah

Title: Cardiovascular Effects of Continuous Dexmedetomidine Infusion Without a Loading Dose in the Pediatric Intensive Care Unit.

Citation: Journal of intensive care medicine, Dec 2015, vol. 30, no. 8, p. 512-517 (December 2015)

Author(s): Cummings, Brian M, Cowl, Allison S, Yager, Phoebe H, Al Saleeby, Chadi M, Shank, Erik S, Noviski, Natan

Abstract: Use of dexmedetomidine in pediatric critical care is common, despite lack of prospective studies on its hemodynamic effects. To describe cardiovascular effects in critically ill children treated with a constant continuous infusion of dexmedetomidine without a loading dose at highest Food and Drug Administration-approved adult dose. Prospective, pilot study of 17 patients with dexmedetomidine infused at a rate of 0.7 μg/kg/h for 6 to 24 hours. Heart rate (HR) and blood pressure (BP) values over time were analyzed by a random effects mixed model. Patients with median age of 1.6 years (1 month to 17 years) and median weight of 11.8 kg (2.8-84 kg) received an infusion for a mean of 16 ± 7.2 hours. There were no cardiac conduction abnormalities. One patient required discontinuation of infusion for predetermined low HR termination criteria at hour 13 of infusion; there was no clinical compromise and it coincided with planned extubation. Decreased HR of 20% from baseline was found in 35% of patients. The mean HR reduction was largest at hour 13 of infusion with a decrease of 13 ± 17 bpm from baseline, but HR changes over time were not statistically significant. Blood pressure effects included a decrease in 12% and an increase in 29%.
There was a small but statistically significant increase in systolic BP of 0.4 mm Hg/h of infusion, \( P < .001 \). A continuous infusion of 0.7 \( \mu g/kg/h \) of dexmedetomidine without a loading dose for up to 24 hours in critically ill children had tolerable effects on HR and BP. © The Author(s) 2014.

**Title:** Failure mode and effective analysis ameliorate awareness of medical errors: a 4-year prospective observational study in critically ill children.

**Citation:** Paediatric anaesthesia, Dec 2015, vol. 25, no. 12, p. 1227-1234 (December 2015)

**Author(s):** Daverio, Marco, Fino, Giuliana, Luca, Brugnaro, Zaggia, Cristina, Pettenazzo, Andrea, Parpaiola, Antonella, Lago, Paola, Amigoni, Angela

**Abstract:** Errors in are estimated to occur with an incidence of 3.7-16.6% in hospitalized patients. The application of systems for detection of adverse events is becoming a widespread reality in healthcare. Incident reporting (IR) and failure mode and effective analysis (FMEA) are strategies widely used to detect errors, but no studies have combined them in the setting of a pediatric intensive care unit (PICU). The aim of our study was to describe the trend of IR in a PICU and evaluate the effect of FMEA application on the number and severity of the errors detected. With this prospective observational study, we evaluated the frequency IR documented in standard IR forms completed from January 2009 to December 2012 in the PICU of Woman's and Child's Health Department of Padova. On the basis of their severity, errors were classified as: without outcome (55%), with minor outcome (16%), with moderate outcome (10%), and with major outcome (3%); 16% of reported incidents were 'near misses’. We compared the data before and after the introduction of FMEA. Sixty-nine errors were registered, 59 (86%) concerning drug therapy (83% during prescription). Compared to 2009-2010, in 2011-2012, we noted an increase of reported errors (43 vs 26) with a reduction of their severity (21% vs 8% 'near misses' and 65% vs 38% errors with no outcome). With the introduction of FMEA, we obtained an increased awareness in error reporting. Application of these systems will improve the quality of healthcare services. © 2015 John Wiley & Sons Ltd.

**Title:** Perceptions of Pediatric Critical Care Nurses on the Initiation of a Nursing-Led Feeding Protocol.

**Citation:** The journal of nursing research : JNR, Dec 2015, vol. 23, no. 4, p. 308-312 (December 2015)

**Author(s):** Kirk, Angela Hui Ping, Ng, Brenda Sok Peng, Lee, Ang Noi, Ang, Bixia, Lee, Jan Hau

**Abstract:** Critically ill children frequently receive inadequate nutritional support. Feeding protocols have been shown to facilitate optimal nutritional care. We aim to determine the perceptions of critical care nurses with regard to the implementation of a feeding protocol as well as to their preferred teaching methods before introducing this protocol in our pediatric intensive care unit (PICU). We hypothesize that nursing experience and educational level are factors that predict readiness to adopt this protocol. All PICU nurses were invited to participate in an online survey to investigate their perceptions on protocol implementation and on preferred teaching methods. Statistical analysis was performed using simple logistic regression and the Fisher exact test. Statistical significance was taken as \( p < .05 \). Seventy-four nurses completed the survey. Fifty-four (73%) had nursing degrees. Mean duration of PICU experience was 6.2 years (5th, 95th percentile: 1, 15). Three quarters of participants (74%, \( n = 55 \)) felt that they did not have sufficient knowledge regarding feeding protocols, and 86% (\( n = 64 \)) expressed that they were keen to implement a feeding
protocol. There was no association between readiness to adopt the feeding protocol with years of ICU experience (OR = 0.99, 95% CI [0.84, 1.18]) and educational level (OR = 1.43, 95% CI [0.31, 6.68]). The preferred teaching methods were bedside teaching (61%), didactic lectures (51%), and the distribution of protocol manuals (50%). PICU nurses felt that the advantages of a feeding protocol included standardization of practice, optimization of patient’s nutritional intake, earlier initiation of feeding, increased patient safety, and the extension of nursing roles. Perceived disadvantages included inapplicability of the feeding protocol to all patients, lack of flexibility in feeding management, increased confusion, and doctors placing little value on the feeding protocol. This study found that nursing experience and level of education do not significantly affect the readiness of nurses to adopt a feeding protocol. Medical and nursing teams should not shy away from introducing a new protocol although their nurses have little experience or prior knowledge of that protocol. Future studies to investigate the impact of tailoring of educational needs before introduction of a new protocol are necessary to study the overall effectiveness of this teaching before introducing a new protocol in the ICU.

Title: Association between Hospital Volume and Within-Hospital Intensive Care Unit Transfer for Sickle Cell Disease in Children's Hospitals.

Citation: The Journal of Pediatrics, Dec 2015, vol. 167, no. 6, p. 1306-1313 (December 2015)

Author(s): Raphael, Jean L, Richardson, Troy, Hall, Matt, Oyeku, Suzette O, Bundy, David G, Kalpatthi, Ram V, Shah, Samir S, Ellison, Angela M

Abstract: To assess the relationship between hospital volume and intensive care unit (ICU) transfer among hospitalized children with sickle cell disease (SCD). We conducted a retrospective cohort study of 83,477 SCD-related hospitalizations at children’s hospitals (2009-2012) using the Pediatric Health Information System database. Hospital-level all-cause and SCD-specific volumes were dichotomized (low vs high). Outcomes were within-hospital ICU transfer (primary) and length of stay (LOS) total (secondary). Multivariable logistic/linear regressions assessed the association of hospital volumes with ICU transfer and LOS. Of 83,477 eligible hospitalizations, 1,741 (2.1%) involving 1,432 unique children were complicated by ICU transfer. High SCD-specific volume (OR 0.77, 95% CI 0.64-0.91) was associated with lower odds of ICU transfer while high all-cause hospital volume was not (OR 0.87, 95% CI 0.73-1.04). A statistically significant interaction was found between all-cause and SCD-specific volumes. When results were stratified according to all-cause volume, high SCD-specific volume was associated with lower odds of ICU transfer at low all-cause volume (OR 0.46, 95% CI 0.38-0.55). High hospital volumes, both all-cause (OR 0.94, 95% CI 0.92-0.97) and SCD-specific (OR 0.86, 95% CI 0.84-0.88), were associated with shorter LOS. Children’s hospitals vary substantially in their transfer of children with SCD to the ICU according to hospital volumes. Understanding the practices used by different institutions may help explain the variability in ICU transfer among hospitals caring for children with SCD. Copyright © 2015 Elsevier Inc. All rights reserved.

Title: Observational study of children admitted to United Kingdom and Republic of Ireland Paediatric Intensive Care Units after out-of-hospital cardiac arrest.

Citation: Resuscitation, Dec 2015, vol. 97, p. 122-128 (December 2015)

Author(s): Scholefield, B R, Gao, F, Duncan, H P, Tasker, R C, Parslow, R C, Draper, E S, McShane, P, Davies, P, Morris, K P
**Abstract:** To estimate the prevalence of children admitted after out-of-hospital cardiac arrest (OHCA) to UK and Republic of Ireland (RoI) Paediatric Intensive Care Units (PICUs) and factors associated with mortality to inform future clinical trial feasibility. Observational study using a prospectively collected dataset of the Paediatric Intensive Care Audit Network (PICANet) of 33 UK and RoI PICUs (January 2003 to June 2010). Cases (0 to <16 years), with documented OHCA surviving to PICU admission and requiring mechanical ventilation were included. Main outcomes were prevalence for admission and death within PICU. Factors associated with mortality were examined with multiple logistic regression analysis. 827 of 111,170 admissions (0.73%; 95% CI [0.48 to 0.98%]) were identified as children admitted following OHCA. PICU mortality for OHCA was 50.5% (418/827). Recruitment into an adequately sized clinical trial would not be feasible with the current prevalence rate. Characteristics at PICU admission associated with increased risk of death included; bilateral unreactive pupils, genetically inherited condition, inter-hospital transfer to PICU, requirement for vasoactive drugs and greater base deficit. Factors associated with reduced risk of death were submersion or a respiratory aetiology and pre-existing respiratory or cardiac conditions. Less than 120 children a year are admitted to PICUs in the UK and RoI after OHCA, limiting options for conducting UK intervention trials. The risk factors associated with mortality identified in this study will allow risk stratification in future studies. Copyright © 2015 Elsevier Ireland Ltd. All rights reserved.

**Title:** Monocyte HLA-DR expression and neutrophil CD64 expression as biomarkers of infection in critically ill neonates and infants.

**Citation:** Pediatric research, Dec 2015, vol. 78, no. 6, p. 683-690 (December 2015)

**Author(s):** Juskewitch, Justin E, Abraham, Roshini S, League, Stacy C, Jenkins, Sarah M, Smith, Carin Y, Enders, Felicity T, Grebe, Stefan K, Carey, William A, Huskins, W Charles

**Abstract:** Reduced monocyte HLA-DR expression and increased neutrophil CD64 expression have been proposed as biomarkers of infection. From 2009-2011, blood samples from neonatal intensive care unit (NICU) and pediatric intensive care unit (ICU) patients <1 y of age were collected at enrollment and during subsequent evaluation for suspected infection, if it occurred. Samples were analyzed for monocyte HLA-DR and neutrophil CD64 expression levels by flow cytometry. Forty-seven infants had study samples collected at enrollment; 26 infants had study samples collected at the time of a suspected infection. At enrollment, there was an inverse relationship between neutrophil CD64 expression and age (P ≤ 0.047). At the time of suspected infection, infants with an infection demonstrated a lower percentage of HLA-DR+ monocytes (P = 0.02, area under the curve (AUC) 0.78), higher percentage of CD64+ neutrophils (P = 0.009, AUC 0.81), and higher neutrophil CD64 expression levels (P = 0.04, AUC 0.75). Monocyte HLA-DR and neutrophil CD64 expression in critically ill infants are related to age and infection.

**Title:** What is the role of the physiotherapist in paediatric intensive care units? A systematic review of the evidence for respiratory and rehabilitation interventions for mechanically ventilated patients.

**Citation:** Physiotherapy, Dec 2015, vol. 101, no. 4, p. 303-309 (December 2015)

**Author(s):** Hawkins, Ellie, Jones, Anne

**Abstract:** Physiotherapy in intensive care units (ICU) has traditionally focussed on the respiratory management of mechanically ventilated patients. Gradually, focus has shifted to include...
rehabilitation in adult ICUs, though evidence of a similar shift in the paediatric ICU (PICU) is limited. Review the evidence to determine the role of physiotherapists in the management of mechanically ventilated patients in PICU. A search was conducted of: PEDro, CINAHL, Medline, PubMed and the Cochrane Library. Studies involving PICU patients who received physiotherapy while invasively ventilated were included in this review. Those involving neonatal or adult ICU patients, or patients on non-invasive or long-term ventilation, were not included in the study. All articles were critically appraised by two reviewers and results were analysed descriptively. Six studies on chest physiotherapy (CPT) met the selection criteria. Results support the use of the expiratory flow increase technique and CPT, especially manual hyperinflation and vibrations, for secretion clearance. Evidence does not support the routine use of either CPT or suction alone. No studies investigating rehabilitation in PICU met selection criteria. A lack of high level evidence was available to inform this review. Evidence indicates that CPT is still the focus of physiotherapy intervention in PICU for mechanically ventilated patients, and supports its use for secretion clearance in this setting. PROSPERO register for systematic reviews (registration no. CRD42014009582). Crown Copyright © 2015. Published by Elsevier Ltd. All rights reserved.

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**Title**: Perioperative feeding management of neonates with CHD: analysis of the Pediatric Cardiac Critical Care Consortium (PC4) registry.

**Citation**: Cardiology in the young, Dec 2015, vol. 25, no. 8, p. 1593-1601 (December 2015)

**Author(s)**: Alten, Jeffrey A, Rhodes, Leslie A, Tabbutt, Sarah, Cooper, David S, Graham, Eric M, Ghanayem, Nancy, Marino, Bradley S, Figueroa, Mayte I, Chanani, Nikhil K, Jacobs, Jeffrey P, Donohue, Janet E, Yu, Sunkyung, Gaies, Michael

**Abstract**: Introduction The optimal perioperative feeding strategies for neonates with CHD are unknown. In the present study, we describe the current feeding practices across a multi-institutional cohort. Inclusion criteria for this study were as follows: all neonates undergoing cardiac surgery admitted to the cardiac ICU for $\geq 24$ hours preoperatively between October, 2013 and July, 2014 in the Pediatric Cardiac Critical Care Consortium registry. The cohort included 251 patients from eight centres. The most common diagnoses included the following: hypoplastic left heart syndrome (17%), coarctation/aortic arch hypoplasia (18%), and transposition of the great arteries (22%); 14% of the patients were $<37$ weeks of gestational age. The median total hospital length of stay was 21 days (interquartile range (IQR) 14-35) and overall mortality was 8%. Preoperative feeding occurred in 133 (53%) patients. The overall preoperative feeding rates across centres ranged from 29 to 79%. Postoperative feeds started on median day 2 (IQR 1-4); for patients with hypoplastic left heart syndrome postoperative feeds started on median day 4. Postoperative feeds were initiated in 89 (35%) patients before extubation (range across centres: 21-61%). The median cardiac ICU discharge feeding volume was 108 cc/kg/day, varying across centres. The mean discharge weight was 280 g above birth weight, ranging from +100 to 430 g across centres. A total of 110 (44%) patients had discharge feeding tubes, ranging from 6 to 80% across centres, and 40/110 patients had gastrostomy/enterostomy tubes placed. In addition, eight (3.2%) patients developed necrotising enterocolitis - three preoperatively and five postoperatively. In this cohort, neonatal feeding practices and outcomes appear to vary across diagnostic groups and institutions. Only half of the patients received preoperative enteral nutrition; almost half had discharge feeding tubes. Multi-institutional collaboration is necessary to determine feeding strategies associated with best clinical outcomes.

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**Title**: Reference values for cerebral blood flow velocities in critically ill, sedated children.
Abstract: Transcranial Doppler ultrasound (TCD) is increasingly being used in the pediatric intensive care unit to assess cerebral hemodynamics during critical illness. However, no normative data in this patient population have been published to date. Therefore, we aimed to describe the anterior and posterior cerebral blood flow velocities in critically ill children undergoing mechanical ventilation and sedation. A prospective, observational cohort study was performed. Children with known or suspected acute or chronic neurologic conditions were excluded. Participants underwent TCD measurement of middle cerebral and basilar artery flow velocities. One hundred and forty children newborn to 17 years of age were enrolled. Measured values were lower in this cohort of children than the previously published cerebral flow velocities of normal, healthy children. Cerebral blood flow velocities of the basal cerebral arteries in critically ill, mechanically ventilated, sedated children are lower than in healthy children of the same age and gender published in previous studies. As such, the cerebral blood flow velocity (CBFV) values reported here may serve as a more accurate reference point when using TCD as a clinical tool to diagnose CBFV abnormalities and guide therapy in this patient population.

Title: Renal replacement therapy in adult and pediatric intensive care: Recommendations by an expert panel from the French Intensive Care Society (SRLF) with the French Society of Anesthesia Intensive Care (SFAR) French Group for Pediatric Intensive Care Emergencies (GFRUP) the French Dialysis Society (SFD).

Abstract: Acute renal failure (ARF) in critically ill patients is currently very frequent and requires renal replacement therapy (RRT) in many patients. During the last 15 years, several studies have considered important issues regarding the use of RRT in ARF, like the time to initiate the therapy, the dialysis dose, the types of catheter, the choice of technique, and anticoagulation. However, despite an abundant literature, conflicting results do not provide evidence on RRT implementation. We present herein recommendations for the use of RRT in adult and pediatric intensive care developed with the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system by an expert group of French Intensive Care Society (SRLF), with the participation of the French Society of Anesthesia and Intensive Care (SFAR), the French Group for Pediatric Intensive Care and Emergencies (GFRUP), and the French Dialysis Society (SFD). The recommendations cover 4 fields: criteria for RRT initiation, technical aspects (access routes, membranes, anticoagulation, reverse osmosis water), practical aspects (choice of the method, peritoneal dialysis, dialysis dose, adjustments), and safety (procedures and training, dialysis catheter management, extracorporeal circuit set-up). These recommendations have been designed on a practical point of view to provide guidance for intensivists in their daily practice.
Available from ProQuest in Annals of Intensive Care
Available from BioMed Central in Annals of Intensive Care

Title: Integrated measures for prevention of invasive Candida infections in preterm infants in a Chinese neonatal intensive care unit.

Citation: American journal of infection control, Dec 2015, vol. 43, no. 12, p. 1321-1325 (December 1, 2015)

Author(s): Chen, Jiahui, Yu, Xiaodan, Zhou, Yijun, Zhang, Yongjun, Zhu, Jianxing, Xie, Lijuan, Qian, Jihong, Yang, Qingnan, Xia, Hongping, Zhu, Tianwen, Zhang, Yonghong, Chen, Yan, Zhao, Dongying, He, Zhenjuan

Abstract: The increasing incidence of invasive Candida infections (ICIs) in preterm infants in the neonatal intensive care unit (NICU) of Xinhua Hospital aroused our concern. We undertook a retrospective study to evaluate the efficacy of different preventive measures for ICI in preterm infants. Preterm infants with gestational age (GA) <33 weeks admitted between 2010 and 2013 were divided into 3 groups according to the preventive measures applied in different periods: the control group (CG), fluconazole group (FG), and integrated measures group (IMG). We analyzed the incidence of ICI and distribution of fungal pathogens in these 3 groups, and also evaluated the efficiency of various measures in preventing ICIs in preterm infants. The study sample comprised 261 preterm infants born at <33 weeks GA, including 94 in the CG, 99 in the FG, and 68 in the IMG. The differences among the groups were not significant at baseline. ICI developed in 41 of the 261 infants (15.7%). The incidence of ICI varied significantly among the groups: 22.3% in the CG (21/94), 18.2% in the FG (18/99), and only 2.9% in the IMG (2/68) (P = .003). ICI was less frequent in the IMG compared with the CG (P <.001) and the FG (P = .003). The integrated measures approach is meaningful for the prevention of ICIs in preterm infants in NICUs with many patients but inadequate medical resources in some developing countries. Copyright © 2015 Association for Professionals in Infection Control and Epidemiology, Inc. Published by Elsevier Inc. All rights reserved.

Title: Increased Occurrence of Tracheal Intubation-Associated Events During Nights and Weekends in the PICU.

Citation: Critical care medicine, Dec 2015, vol. 43, no. 12, p. 2668-2674 (December 2015)

Author(s): Rehder, Kyle J, Giuliano, John S, Napolitano, Natalie, Turner, David A, Nuthall, Gabrielle, Nakharni, Vinay M, Nishisaki, Akira, National Emergency Airway Registry for Children and Pediatric Acute Lung Injury and Sepsis Investigators

Abstract: Adverse tracheal intubation-associated events are common in PICUs. Prior studies suggest provider and practice factors are important contributors to tracheal intubation-associated events. Little is known about how the incidence of tracheal intubation-associated events is affected by the time of day, day of the week, or presence of in-hospital attending-level intensivists. We hypothesize that tracheal intubations occurring during nights and weekends are associated with a higher frequency of tracheal intubation-associated events. Retrospective observational cohort study. Twenty international PICUs. Critically ill children requiring tracheal intubation. None. We analyzed 5,096 tracheal intubation courses from July 2010 to March 2014 from the prospective multicenter National Emergency Airway Registry for Children. Frequency of a priori-defined tracheal intubation-associated events was the primary outcome. Occurrence of any tracheal intubation-associated
events and severe tracheal intubation-associated events were more common during nights (19:00 to
06:59) and weekends compared with weekdays (19% vs 16%, p = 0.01; 7% vs 6%, p = 0.05,
respectively). This difference was significant in emergent intubations after adjusting for site-level
clustering and patient factors: for any tracheal intubation-associated events: adjusted odds ratio,
1.20; 95% CI, 1.02-1.41; p = 0.03; but not significant in nonemergent intubations: adjusted odds
ratio, 0.94; 95% CI, 0.63-1.40; p = 0.75. For emergent intubations, PICUs with home-call attending
coverage had a significantly higher frequency of tracheal intubation-associated events during nights
and weekends (adjusted odds ratio, 1.29; 95% CI, 1.01-1.66; p = 0.04), and this difference was
attenuated in PICUs with in-hospital attending coverage (adjusted odds ratio, 1.12; 95% CI, 0.91-
1.39; p = 0.28). Higher occurrence of tracheal intubation-associated events was observed during
nights and weekends. This difference was primarily attributed to emergent intubations. In- hospital
attending physician coverage attenuated this discrepancy between weekdays versus nights and
weekends but was not fully protective for tracheal intubation-associated events.

Full Text:
Available from Ovid in Critical Care Medicine

Title: Could EEG Monitoring in Critically Ill Children Be a Cost-effective Neuroprotective Strategy?

Citation: Journal of clinical neurophysiology : official publication of the American

Author(s): Abend, Nicholas S, Topjian, Alexis A, Williams, Sankey

Abstract: Electrographic status epilepticus (ESE) in critically ill children is associated with unfavorable
functional outcomes, but identifying candidates for ESE management requires resource-intense EEG
monitoring. A cost-effectiveness analysis was performed to estimate how much ESE identification
and management would need to improve patient outcomes to make EEG monitoring strategies a
good value. A decision tree was created to examine the relationships among variables important to
deciding whether to perform EEG monitoring. Variable costs were estimated from their component
parts, outcomes were estimated in quality-adjusted life-years, and incremental cost-effectiveness
ratios were calculated to compare the relative values using four alternative EEG monitoring
strategies that varied by monitoring duration. Forty-eight hours of EEG monitoring would be worth
its cost if ESE identification and management improved patient outcomes by ≥7%. If ESE
identification and management improved patient outcomes by 3% to 6%, then 24 or 48 hours of EEG
monitoring would be worth the cost depending on how much decision makers were willing to pay
per quality-adjusted life-year gained. If ESE identification and management improved outcomes by
as little as 3%, then 24 hours of EEG monitoring would be worth the cost. EEG monitoring has the
potential to be cost-effective if ESE identification and management improves patient outcomes by as
little as 3%.

Title: Predicting fluid responsiveness in 100 critically ill children: the effect of baseline contractility.

Citation: Intensive care medicine, Dec 2015, vol. 41, no. 12, p. 2161-2169 (December 2015)

Author(s): Saxena, Rohit, Durward, Andrew, Steeley, Sarah, Murdoch, Ian A, Tibby, Shane M

Abstract: Fluid overload is a risk factor for poor outcome in intensive care; thus volume loading
should be tailored towards patients who are likely to increase stroke volume. We aimed to evaluate
the paediatric predictive ability (stroke volume increase of at least 15 % after fluid bolus) of novel
and established volumetric and dynamic haemodynamic variables, and assess the influence of baseline contractility on response. We assessed 142 volume loading episodes (10 ml/kg crystalloid) in 100 critically ill ventilated children, median (interquartile) weight 10 (5.6-15) kg. Eight advanced haemodynamic variables were assessed using two commercially available devices. Systemic ventricular contractility was measured as the maximum rate of systolic arterial pressure rise. Overall, predictive ability was poor, with volumetric variables performing better than dynamic (area under receiver operating characteristic curves ranged from 0.53 to 0.67). The best predictor was total end-diastolic volume index; however, this did not increase in a consistent way with volume loading, with change post volume being weakly related to baseline values (r = -0.19, p = 0.02). A multivariable model quantified the importance of contractility in stroke volume response. Children with high baseline contractility (≥75th centile) typically achieved a positive stroke volume response when end-diastolic volume values changed by 10-15 ml/m², whereas patients with low contractility (≤25th centile) typically required end-diastolic volume increases of 35-40 ml/m². Current paediatric predictors of volume response perform poorly; prediction may be improved if baseline contractility is taken into account.

Title: Effect of a Hospital-wide High-Flow Nasal Cannula Protocol on Clinical Outcomes and Resource Utilization of Bronchiolitis Patients Admitted to the PICU.

Citation: Hospital pediatrics, Dec 2015, vol. 5, no. 12, p. 613-618, 2154-1663 (December 2015)

Author(s): Riese, Jeffrey, Fierce, Jamie, Riese, Alison, Alverson, Brian K

Abstract: To assess the association of the introduction of a high-flow nasal cannula (HFNC) protocol with clinical outcomes and hospital charges of infants with bronchiolitis initially admitted to the PICU. We conducted a retrospective, nonrandomized, preintervention-postintervention study of infants with bronchiolitis initially admitted to the PICU for HFNC. We compared patients admitted in the 24 months before and after protocol initiation for HFNC use on the general wards. The primary outcome assessed was length of hospital stay (LOS), and the secondary outcomes included total hospital charges, intubation, and 30-day readmission. We conducted bivariate analysis using χ² test for categorical variables and Student’s t test or Wilcoxon rank sum test for continuous variables. Two hundred and ninety patients were admitted to the PICU on HFNC; 120 patients were admitted before and 170 admitted after the introduction of HFNC use on the general wards. Comparing the 2 groups, the median LOS was significantly reduced (4 days vs 3 days; P < .001), as was the median total hospital charges ($12 257 vs $9337; P < .001). After starting HFNC use on the wards, 30% of patients initially admitted to the PICU were ultimately transferred to the wards while still on HFNC. There was no difference in intubation rate or 30-day readmission between the 2 groups. For bronchiolitis patients initially admitted to the PICU, initiating a guideline for HFNC use on the general pediatric wards is associated with reduced total hospital LOS and total hospital charges, with no difference in intubation rates or 30-day readmission. Copyright © 2015 by the American Academy of Pediatrics.

Full Text: Available from Highwire Press in Hospital Pediatrics

Title: Management Issues in Intensive Care Units for Infants and Children with Heart Disease.

Citation: Indian journal of pediatrics, Dec 2015, vol. 82, no. 12, p. 1164-1171 (December 2015)

Author(s): Iyer, Parvathi U
Abstract: Admission of infants and children with cardiac disease to the neonatal (NICU) and pediatric ICU (PICU) is ever increasing in India (30-50 % of all admissions). The commonest indication for admission to the NICU or PICU is acute deterioration of cardiac disease. This includes: acute heart failure, hypercyanotic spells, arrhythmias, pericardial tamponade and sick cardiac neonates who need urgent intervention. Other increasingly frequent indications for ICU admission include heart failure with concomitant chest infection and impending respiratory failure and, severe cyanotic heart disease with various stroke syndromes. It is thus essential that a pediatrician be comfortable with the ICU management of such children and that low cost ICU modalities be utilized in order to reach out to as many children as feasible. It is heartening that there is renewed interest in inexpensive therapies like noninvasive ventilation and therapeutic hypothermia.
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