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NICU

Current Awareness Newsletter

June 2017

(Quarterly)

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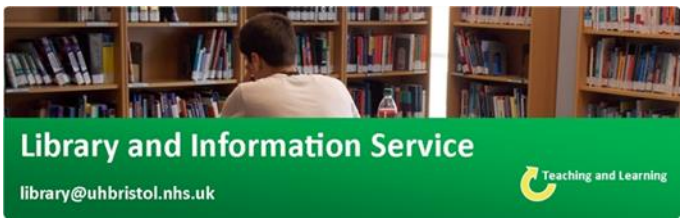

Training Calendar 2017

All sessions are one hour

June (12.00-13.00)

29th (Thurs) Literature Searching

July (13.00-14.00)

3rd (Mon) Interpreting Statistics
12th (Wed) Critical Appraisal
21st (Fri) Literature Searching
26th (Wed) Interpreting Statistics

August (12.00-13.00)

4th (Fri) Critical Appraisal
9th (Wed) Literature Searching
15th (Tues) Interpreting Statistics
24th (Thurs) Critical Appraisal

Your Outreach Librarian –Helen Pullen

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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 one-to-one session where we can guide you through the process of creating a well-focused literature research. Please email requests to library@uhbristol.nhs.uk

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Updates

NICE National Institute for Health and Care Excellence

In development

Developmental follow-up of children and young people born preterm (GID-CGWAVE0752)

August 2017 NICE guidelines

End of life care for infants, children and young people (GID-QS10031)

October 2017 Quality standards

Faltering growth - recognition and management of faltering growth in children (GID-CGWAVE0767)
October 2017 NICE guidelines

Neuroblastoma (high risk) - APN311 [ID910] (GID-TA10069)

March 2018 Technology appraisal guidance

Parenteral nutrition in neonates (GID-NG10037)

August 2019 NICE guidelines

Specialist neonatal respiratory care for babies born preterm (GID-NG10039)

April 2019 NICE guidelines

Cochrane Library

Orotracheal intubation in infants performed with a stylet versus without a stylet

Joyce E O'Shea, Jennifer O'Gorman, Aakriti Gupta, Sanjay Sinhal, Jann P Foster, Liam AF O'Connell, C Omar F Kamlin, Peter G Davis

Local wound analgesia in infants undergoing thoracic or abdominal surgery

Eva Sloukova, Himanshu Popat, Lisa J Jones, Albert Shun, Kaye Spence

Tracheal suction at birth in non-vigorous neonates born through meconium-stained amniotic fluid

Sushma Nangia, Anu Thukral, Deepak Chawla

Transcutaneous bilirubinometry versus total serum bilirubin measurement for newborns

Charles I Okwundu, Olalekan A Uthman, Gautham Suresh, Johan Smith, Charles S Wiysonge, Vinod K Bhutani

Higher versus lower sodium intake for preterm infants

Wendy Chan, Michele YK Chua, Edward Teo, David A Osborn, Pita Birch

Routine oro/nasopharyngeal suction versus no suction at birth

Jann P Foster, Jennifer A Dawson, Peter G Davis, Hannah G Dahlen

Lisa M Askie, Brian A Darlow, Peter G Davis, Neil Finer, Ben Stenson, Maximo Vento, Robin Whyte

Arginine supplementation for prevention of necrotising enterocolitis in preterm infants

Prakeshkumar S Shah, Vibhuti S Shah, Lauren E Kelly

Repeated lumbar or ventricular punctures in newborns with intraventricular haemorrhage

Andrew Whitelaw, Richard Lee-Kelland

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NEONATOLOGY

Buprenorphine treatment of neonatal abstinence syndrome (May 2017)

Morphine and methadone are the preferred drugs for initial pharmacologic management of neonatal abstinence syndrome (NAS). However, in a single-center trial that randomly

assigned 63 infants with NAS to sublingual buprenorphine or oral morphine, sublingual buprenorphine resulted in a shorter median duration of treatment and median length of hospital stay, with no difference in the use of adjunctive phenobarbital or in adverse events [19]. Until these findings are confirmed in trials with larger numbers of patients and from other centers, we continue to use either morphine or methadone for initial pharmacologic treatment of NAS. (See "Neonatal abstinence syndrome", section on 'Opioid therapy'.)

Hydrocortisone and prophylaxis for bronchopulmonary dysplasia in preterm infants (April 2017)

Although prophylactic postnatal dexamethasone therapy reduces the risk of bronchopulmonary dysplasia (BPD), its use has been restricted because of an increased risk for cerebral palsy. Hydrocortisone treatment has been studied as an alternative to dexamethasone, but data regarding efficacy and potential harms are discordant and limited by early termination of the trials. One previous trial demonstrated a reduced risk of BPD in high-risk preterm infants (gestational age <28 weeks) treated with hydrocortisone, compared with placebo, and no increase in the rate of short-term adverse events. Now, a follow-up study of these infants at a median corrected age of 22 months found no difference in neurodevelopmental outcome, including cerebral palsy, between the two groups [20]. However, before exposing a significant number of preterm infants to hydrocortisone prophylaxis, further data are needed regarding the balance between reduction of BPD and potential adverse effects of this approach. (See "Postnatal use of corticosteroids in bronchopulmonary dysplasia", section on 'Hydrocortisone'.)

Docosahexaenoic acid supplementation and bronchopulmonary dysplasia in preterm infants (April 2017)

Although previous data suggested that docosahexaenoic acid (DHA) supplementation lowered the risk of bronchopulmonary dysplasia (BPD) in preterm infants, a multicenter randomized trial in infants (gestational age <29 weeks) showed that daily DHA supplementation 60 mg/kg of body weight increased the risk of BPD compared with placebo (49 versus 44 percent) [21]. These results confirm our recommendation to not provide supplemental DHA to prevent BPD in preterm infants. (See "Prevention of bronchopulmonary dysplasia", section on 'Docosahexaenoic acid'.)

Current Awareness Database Articles

If you would like any of the articles in full text, or if you would like a more focused search on your own topic, please contact us: **library@bristol.nhs.uk**

1. Red blood cell transfusions can induce proinflammatory cytokines in preterm infants.

Author(s): Dani, Carlo; Poggi, Chiara; Gozzini, Elena; Leonardi, Valentina; Sereni, Alice; Abbate, Rosanna; Gori, Anna Maria

Source: Transfusion; May 2017; vol. 57 (no. 5); p. 1304-1310

Publication Date: May 2017

Publication Type(s): Journal Article Observational Study

PubMedID: 28295397

Abstract:BACKGROUNDThe risk of developing red blood cell (RBC) transfusion-associated necrotizing enterocolitis (TANEC) in preterm infants has recently been emphasized. Our aim was to assess changes in cytokine serum levels after RBC transfusions in a cohort of very preterm infants to evaluate their possible proinflammatory effect.STUDY DESIGN AND METHODSWe carried out a prospective observational study. One transfusion event was studied in infants less than 32 weeks' gestation and more than 7 days old (n = 20) admitted to a tertiary neonatal intensive care unit. Interleukin (IL)-1β, IL-6, IL-8, tumor necrosis factor-α, interferon-γ (IFN-γ), IL-17, monocyte chemoattractant protein-1 (MCP-1), interferon-γ-induced protein 10 (IP-10), intracellular adhesion molecule-1 (ICAM-1), and vascular cell adhesion molecule serum levels were measured in enrolled patients within 120 minutes before (T0) the RBC transfusion and then within 120 minutes (T1), 12 ± 3 hours (T2), 24 ± 6 hours (T3), and 48 ± 6 hours (T4) after the end of RBC transfusion.RESULTSInfants received 19.8 ± 3.0 mL of RBCs at the mean age of 50 ± 18 days. Their hematocrit level increased from 24.1 ± 1.2% to 39.4 ± 2.9%. IL-1β, IL-8, IFN-γ, IL-17, MCP-1, IP-10, and ICAM-1 increased significantly after RBC transfusions.CONCLUSIONProinflammatory cytokines are increased after RBC transfusion. These findings may contribute to explaining the pathogenesis of TANEC and suggest the opportunity of adopting wise transfusion guidelines that would help to avoid detrimental risks of transfusion-related immunomodulation and of undertransfusion.

Database: Medline

2. The clinical significance of sCD14-ST for blood biomarker in neonatal hematosepsis: A diagnostic accuracy study.

Author(s): Xiao, Ting; Chen, Li-Ping; Zhang, Li-Hua; Lai, Fu-Huang; Zhang, Li; Qiu, Qun-Feng; Que, Rong-Liang; Xie, SiSi; Wu, Ding-Chang

Source: Medicine; May 2017; vol. 96 (no. 18); p. e6823

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28471985

Abstract: Hematosepsis is a systemic inflammatory response syndrome (SIRS) with suspected or confirmed infection, which is the most common infectious disease in clinical neonatal intensive care unit. As the rapid development of neonatal hematosepsis caused by various basic diseases, the mortality rate is high, and there are some sequelae.We report the lasted study to date with 96 cases from Fujian Longyan First Hospital between 2013 and 2015. The aim of our study is to explore the value of soluble cluster of differentiation 14 subtype (sCD14-ST) in whole blood for differential

diagnosis of neonatal hematosepsis at an early stage, and used in evaluation of the severity about sepsis combined with acute physiology and chronic health evaluation II (APACHE-II) score, procalcitonin (PCT), C reactive protein (CRP), and leukocyte (WBC).In our cohort, all cases met the diagnostic criteria for hematosepsis specific for newborns. We selected 42 neonates with hematosepsis, 54 neonates with nonhematosepsis, 44 noninfectious SIRS neonates, and 53 healthy neonatal controls. Which were determined the sCD14-ST, PCT, CRP, and WBC of all samples before treatment. Then assign the APACHE-II score for the all samples before and after treatment.The study shows, sCD14-ST levels were significantly higher in hematosepsis than nonhematosepsis group (t = -2.112, P = .041). Meanwhile, sCD14-ST levels were significantly higher in neonatal hematosepsis than in noninfectious SIRS group and controls (χ = 57.812, 68.944, P < .01). However, sCD14-ST in hematosepsis group was positively correlated with APACHE-II score (R-value = 0.415, P < .01). During treatment, the sCD14-ST level was decreased obviously along with APACHE-II score, PCT, CRP, and WBC (χ = 35.019, 78.399, 52.363, 25.912, 7.252, all P values <.01). The area under the curve (AUC) of sCD14-ST was 0.942. The differences in ROC of sCD14-ST compared with PCT, CRP, and WBC were statistically significant (Z = -6.034, -4.474, -5.722, all P values <.01). The sensitivity and specificity of sCD14-ST were 95.2% and 84.9%, respectively.sCD14-ST could be a blood biomarker for early identification and disease valuation in newborns hematosepsis infection; and its diagnostic value is superior to other laboratory indexes.

Database: Medline

3. The results of newborn hearing screening by means of transient otoacoustic emissions - has anything changed over 10 years?

Author(s): Wroblewska-Seniuk, Katarzyna; Greczka, Grazyna; Dabrowski, Piotr; Szyfter, Witold; Mazela, Jan

Source: International journal of pediatric otorhinolaryngology; May 2017; vol. 96 ; p. 4-10

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28390612

Abstract:OBJECTIVESUniversal newborn hearing screening (UNHS) has become the standard of care in many countries. The aim of this study was to evaluate the results of UNHS after ten years of the program in Poland and to compare them with the results of 2003.METHODSIn the study, we analyze the results of UNHS in the University Hospital in Poznan, Poland. Between 01.01.2013 and 31.12.2013, 6827 children were examined by means of otoacoustic emissions.RESULTSRisk factors (RF) were identified in 772 (11.3%) newborns, which is significantly less than 10 years ago (p 5 days (RR = 10.69). In our previous study, the highest RR of positive test results was in infants with family history, congenital malformations and low Apgar score. We found that most predictive as to the final diagnosis was bilaterally positive OAE test. In most patients, the second check confirmed the diagnosis, independently of RF. The number of false positive tests at the 1st level of screening is significantly lower now than 10 years ago, probably due to better staff training.CONCLUSIONSLong term monitoring and the appropriate management of hearing deficit in children is essential. UNHS seems to be the most efficient way of finding children who require treatment of hearing impairment. The prevalence of most risk factors of hearing deficit has significantly changed over the years. The number of false positive results has significantly decreased over the years thanks to better staff training.

Database: Medline

4. Drug-induced renal injury in neonates: challenges in clinical practice and perspectives in drug development.

Author(s): Girardi, Anna; Raschi, Emanuel; Galletti, Silvia; Allegaert, Karel; Poluzzi, Elisabetta; De Ponti, Fabrizio

Source: Expert opinion on drug metabolism & toxicology; May 2017; vol. 13 (no. 5); p. 555-565

Publication Date: May 2017

Publication Type(s): Journal Article Review

PubMedID: 28141945

Abstract:INTRODUCTIONAcute kidney injury (AKI) is frequently diagnosed in the neonatal population, especially in those admitted to intensive care units, and poses several challenges for clinicians mainly because of difficulties in timely identification of renal impairment and the need to administer drugs with potential nephrotoxicity. In this context, research on biomarkers is growing for their implication in the early detection of renal damage and their higher sensitivity in monitoring renal activity, but also as an important tool for drug development. Areas covered: We described the tools currently used to detect renal damage in neonatal settings, their limits and applicability, as well as the role of drugs on renal toxicity occurrence. Subsequently, we discuss current knowledge on new biomarkers for the detection of kidney injury and drug-induced kidney injury in neonates, and the qualification programs developed by regulatory agencies for biomarkers intended as tools in drug development. Expert opinion: Some molecules are emerging as potential biomarkers for early detection of AKI: promising data has demonstrated higher sensitivity and accuracy compared with tools currently used in the clinical setting. In addition, novel techniques (e.g. high power magnetic resonance imaging) to assess long-term consequences of AKI in neonates are in early steps of development.

Database: Medline

5. Starplasty tracheostomy: case series and literature review.

Author(s): Schwarz, Yehuda; Muhanna, Nidal; Raveh, David; Shaul, Chanan; Shahroor, Sarit; Peleg, Uri; Attal, Pierre; Sichel, Jean-Yves

Source: European archives of oto-rhino-laryngology : official journal of the European Federation of Oto-Rhino-Laryngological Societies (EUFOS) : affiliated with the German Society for Oto-Rhino-Laryngology - Head and Neck Surgery; May 2017; vol. 274 (no. 5); p. 2261-2266

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28175990

Abstract:OBJECTIVESThe starplasty tracheostomy (SPT) technique has been suggested to reduce the short-term complications of tracheostomy, including accidental decannulation and pneumothorax. The aim of the present study was to conduct a review of key parameters prior to and following treatment of neonates and children with the SPT technique, including indications, complications, perioperative department stay, and overall length of stay in one University-Affiliated Medical Center.METHODSA retrospective chart review of all children under the age of 18 underwent SPT in a single center between February 2006 and January 2012.RESULTSAmong the 39 patients reviewed, the median age at the time of surgery was 14.5 months, ranging from 3 days to 8.8 years. The most common indication for SPT was respiratory insufficiency resulting from central nervous system disorders (15, 38.4%) followed by neuromuscular disorders (14, 35.9%). Ten (25.6%) operations were performed on neonatal intensive care unit (NICU) patients and 29 (74.4%) on pediatric intensive care unit (PICU) patients. The median postoperative hospital stay was 19.5 days (range of 3-207 days);

however, the median postoperative stay in the PICU was 13.5 days. There were no decannulations or any other short-term complications after SPT, and no SPT-related deaths occurred.CONCLUSIONSIn our series, pediatric SPT was not associated with any major complications. Therefore, we conclude that SPT should be considered as a safe and advantageous alternative for traditional tracheotomy, especially in patients with low probability of future decannulation, and, therefore, at low risk of a persistent tracheocutaneous fistula.

Database: Medline

6. Two-hourly versus 3-hourly feeding for very low birthweight infants: a randomised controlled trial.

Author(s): Ibrahim, Nor Rosidah; Kheng, Tan Hooi; Nasir, Ariffin; Ramli, Noraida; Foo, Jimmy Lee Kok; Syed Alwi, Sharifah Huda; Van Rostenberghe, Hans

Source: Archives of disease in childhood. Fetal and neonatal edition; May 2017; vol. 102 (no. 3); p. F225

Publication Date: May 2017

Publication Type(s): Randomized Controlled Trial Multicenter Study Journal Article

PubMedID: 27671836

Available in full text at Fetal and Neonatal - from Highwire Press

Available in full text at Fetal and Neonatal - from Highwire Press

Abstract:OBJECTIVETo determine whether feeding with 2-hourly or 3-hourly feeding interval reduces the time to achieve full enteral feeding and to compare their outcome in very low birthweight preterm infants.DESIGNParallel-group randomised controlled trial with a 1:1 allocation ratio.SETTINGTwo regional tertiary neonatal intensive care units.PATIENTS150 preterm infants less than 35 weeks gestation with birth weight between 1.0 and 1.5 kg were recruited.INTERVENTIONSInfants were enrolled to either 2-hourly or 3-hourly interval feeding after randomisation. Blinding was not possible due to the nature of the intervention.MAIN OUTCOME MEASURESThe primary outcome was time to achieve full enteral feeding (≥100 mL/kg/day). Secondary outcomes include time to regain birth weight, episode of feeding intolerance, peak serum bilirubin levels, duration of phototherapy, episode of necrotising enterocolitis, nosocomial sepsis and gastro-oesophageal reflux.RESULTS72 infants were available for primary outcome analysis in each group as three were excluded due to death-three deaths in each group. The mean time to full enteral feeding was 11.3 days in the 3-hourly group and 10.2 days in the 2-hourly group (mean difference 1.1 days; 95% CI -0.4 to 2.5; p=0.14). The mean time to regain birth weight was shorter in 3-hourly group (12.9 vs 14.8 days, p=0.04). Other subgroup analyses did not reveal additional significant results. No difference in adverse events was found between the groups.CONCLUSION3-hourly feeding was comparable with 2-hourly feeding to achieve full enteral feeding without any evidence of increased adverse events.TRIAL REGISTRATION NUMBERACTRN12611000676910, pre-result.

Database: Medline

7. Comparative Efficacy and Safety of Caffeine and Aminophylline for Apnea of Prematurity in Preterm (≤34 weeks) Neonates: A Randomized Controlled Trial.

Author(s): Shivakumar, M; Jayashree, P; Najih, Muhammad; Lewis, Leslie Edward Simon; Bhat Y, Ramesh; Kamath, Asha; Shashikala, -

Source: Indian pediatrics; Apr 2017; vol. 54 (no. 4); p. 279-283

Publication Date: Apr 2017

Publication Type(s): Randomized Controlled Trial Journal Article

PubMedID: 28474588

Abstract:OBJECTIVETo compare the efficacy and safety of standard doses of Caffeine and Aminophylline for Apnea of prematurity.STUDY DESIGNRandomized controlled trial.SETTINGTertiary-care referral centre and a teaching institution in Southern India. Trial was conducted from February 2012 to January 2015.PARTICIPANTS240 preterm (≤34 wk) neonates with apnea of prematurity.INTERVENTIONSNeonates randomized into two groups: Caffeine group received loading dose of caffeine citrate (20 mg/kg) followed by 5 mg/kg/day maintenance dose every 24 hour. Aminophylline group received loading dose of Aminophylline - 5 mg/kg and maintenance dose of 1.5 mg/kg 8-hourly.OUTCOME MEASURESDifference in apneic spells, associated respiratory morbidity, and acute adverse events were assessed. Association of efficacy with therapeutic drug levels was also evaluated.RESULTSInfants on aminophylline experienced less apnea spells in 4-7 days of therapy (P=0.03). Mean apnea rate and isolated desaturations were similar in 1-3, 4-7 and 8-14 days of therapy. No difference was noted in duration of Neonatal Intensive Care Unit stay and hospital stay. Mean heart rate was significantly high in Aminophylline group (P<0.001). Risk of developing tachycardia was less (RR 0.30; 95% CI range 0.15 to 0.60; P<0.001) in Caffeine- over Aminophylline-treated infants.CONCLUSIONAminophylline is as effective as caffeine for prevention of apneic spells in preterm neonates; however, dosage optimization needs to be done to reduce toxicity.

Database: Medline

8. Perfusion Index and Pulse Oximetry Screening for Congenital Heart Defects.

Author(s): Schena, Federico; Picciolli, Irene; Agosti, Massimo; Zuppa, Antonio Alberto; Zuccotti, Gianvincenzo; Parola, Luciana; Pomero, Giulia; Stival, Giorgio; Markart, Markus; Graziani, Silvia; Gagliardi, Luigi; Bellan, Cristina; La Placa, Simona; Limoli, Giuseppe; Calzetti, Gabriella; Guala, Andrea; Bonello, Enza; Mosca, Fabio; Neonatal Cardiology Study Group of the Italian Society of Neonatology

Source: The Journal of pediatrics; Apr 2017; vol. 183 ; p. 74

Publication Date: Apr 2017

Publication Type(s): Comparative Study Multicenter Study Journal Article

PubMedID: 28153478

Abstract:OBJECTIVETo evaluate the efficacy of combined pulse oximetry (POX) and perfusion index (PI) neonatal screening for severe congenital heart defects (sCHD) and assess different impacts of screening in tertiary and nontertiary hospitals.STUDY DESIGNA multicenter, prospective study in 10 tertiary and 6 nontertiary maternity hospitals. A total of 42 169 asymptomatic newborns from among 50 244 neonates were screened; exclusion criteria were antenatal sCHD diagnosis, postnatal clinically suspected sCHD, and neonatal intensive care unit admission. Eligible infants underwent pre- and postductal POX and PI screening after routine discharge examination. Targeted sCHD were anatomically defined. Positivity was defined as postductal oxygen saturation (SpO2) ≤95%, prepostductal SpO2 gradient >3%, or PI <0.90. Confirmed positive cases underwent echocardiography for definitive diagnosis. Missed cases were identified by consulting clinical registries at 6 regional pediatric heart centers. Main outcomes were incidence of unexpected sCHD; proportion of undetected sCHD after discharge in tertiary and nontertiary hospitals; and specificity, sensitivity, positive predictive value, and negative predictive value of combined screening.RESULTSOne hundred forty-two sCHD were detected prenatally. Prevalence of unexpected sCHD was 1 in 1115 live births, similar in tertiary and nontertiary hospitals. Screening identified 3 sCHD (low SpO2, 2; coarctation for low PI, 1). Four cases were missed. In tertiary hospitals, 95% of

unsuspected sCHDs were identified clinically, whereas only 28% in nontertiary units; in nontertiary units PI-POX screening increased the detection rate to 71%.CONCLUSIONSPI-POX predischarge screening provided benefits in nontertiary units, where clinical recognition rate was low. PI can help identify coarctation cases missed by POX but requires further evaluation in populations with higher rates of missed cases.

Database: Medline

9. Clinical Factors Associated with Cerebral Metabolism in Term Neonates with Congenital Heart Disease.

Author(s): Harbison, Anna Lonyai; Votava-Smith, Jodie K; Del Castillo, Sylvia; Kumar, S Ram; Lee, Vince; Schmithorst, Vincent; Lai, Hollie A; O'Neil, Sharon; Bluml, Stefan; Paquette, Lisa; Panigrahy, Ashok

Source: The Journal of pediatrics; Apr 2017; vol. 183 ; p. 67

Publication Date: Apr 2017

Publication Type(s): Journal Article

PubMedID: 28109537

Abstract:OBJECTIVETo determine associations between patient and clinical factors with postnatal brain metabolism in term neonates with congenital heart disease (CHD) via the use of quantitative magnetic resonance spectroscopy.STUDY DESIGNNeonates with CHD were enrolled prospectively to undergo pre- and postoperative 3T brain magnetic resonance imaging. Short-echo single-voxel magnetic resonance spectroscopy of parietal white matter was used to quantify metabolites related to brain maturation (n-acetyl aspartate, choline, myo- inositol), neurotransmitters (glutamate and gamma-aminobutyric acid), energy metabolism (glutamine, citrate, glucose, and phosphocreatine), and injury/apoptosis (lactate and lipids). Multivariable regression was performed to search for associations between (1) patient-specific/prenatal/preoperative factors with concurrent brain metabolism and (2) intraoperative and postoperative factors with postoperative brain metabolism.RESULTSA total of 83 magnetic resonance images were obtained on 55 subjects. No patient-specific, prenatal, or preoperative factors associated with concurrent metabolic brain dysmaturation or elevated lactate could be identified. Chromosome 22q11 microdeletion and age at surgery were predictive of altered concurrent white matter phosphocreatine ($P < .0055$). The only significant intraoperative association found was increased deep hypothermic circulatory arrest time with reduced postoperative white matter glutamate and gamma-aminobutyric acid ($P < .0072$). Multiple postoperative factors, including increased number of extracorporeal membrane oxygenation days ($P < .0067$), intensive care unit, length of stay ($P < .0047$), seizures in the intensive care unit ($P < .0009$), and home antiepileptic use ($P < .0002$), were associated with reduced postoperative white matter n-acetyl aspartate.CONCLUSIONMultiple postoperative factors were found to be associated with altered brain metabolism in term infants with CHD, but not patient-specific, preoperative, or intraoperative factors.

Database: Medline

10. Auditory Exposure in the Neonatal Intensive Care Unit: Room Type and Other Predictors.

Author(s): Pineda, Roberta; Durant, Polly; Mathur, Amit; Inder, Terrie; Wallendorf, Michael; Schlaggar, Bradley L

Source: The Journal of pediatrics; Apr 2017; vol. 183 ; p. 56

Publication Date: Apr 2017

Publication Type(s): Comparative Study Journal Article

PubMedID: 28189301

Abstract:OBJECTIVETo quantify early auditory exposures in the neonatal intensive care unit (NICU) and evaluate how these are related to medical and environmental factors. We hypothesized that there would be less auditory exposure in the NICU private room, compared with the open ward.STUDY DESIGNPreterm infants born at ≤ 28 weeks gestation (33 in the open ward, 25 in private rooms) had auditory exposure quantified at birth, 30 and 34 weeks postmenstrual age (PMA), and term equivalent age using the Language Environmental Acquisition device.RESULTSMeaningful language (P < .0001), the number of adult words (P < .0001), and electronic noise (P < .0001) increased across PMA. Silence increased (P = .0007) and noise decreased (P < .0001) across PMA. There was more silence in the private room (P = .02) than the open ward, with an average of 1.9 hours more silence in a 16-hour period. There was an interaction between PMA and room type for distant words (P = .01) and average decibels (P = .04), indicating that changes in auditory exposure across PMA were different for infants in private rooms compared with infants in the open ward. Medical interventions were related to more noise in the environment, although parent presence (P = .009) and engagement (P = .002) were related to greater language exposure. Average sound levels in the NICU were 58.9 ± 3.6 decibels, with an average peak level of 86.9 ± 1.4 decibels.CONCLUSIONSUnderstanding the NICU auditory environment paves the way for interventions that reduce high levels of adverse sound and enhance positive forms of auditory exposure, such as language.

Database: Medline

11. Respiratory Support for Very Low Birth Weight Infants Receiving Dexamethasone.

Author(s): Virkud, Yamini V; Hornik, Christoph P; Benjamin, Daniel K; Laughon, Matthew M; Clark, Reese H; Greenberg, Rachel G; Smith, P Brian

Source: The Journal of pediatrics; Apr 2017; vol. 183 ; p. 26

Publication Date: Apr 2017

Publication Type(s): Journal Article Observational Study

PubMedID: 28108103

Abstract:OBJECTIVETo assess how neonatal intensive care units followed the American Academy of Pediatrics guidelines for use of dexamethasone in preterm infants by evaluating respiratory support at the time of dexamethasone administration.STUDY DESIGNThis is an observational study of infants discharged from one of 290 neonatal intensive care units from 2003 to 2010. The cohort included very low birth weight (0.3.RESULTSOf 81 292 infants; 7093 (9%) received dexamethasone. At the time that dexamethasone was initiated, 4604 (65%) of infants were on significant respiratory support.CONCLUSIONSIn accordance with the American Academy of Pediatrics recommendations, a majority of infants were on significant respiratory support when receiving dexamethasone, yet a substantial number of infants still received dexamethasone on less than significant respiratory support. Further research on reducing dexamethasone use in premature infants is required to decrease the risk of neurodevelopmental impairment.

Database: Medline

12. Extubation Failure in Neonates After Cardiac Surgery: Prevalence, Etiology, and Risk Factors.

Author(s): Miura, Shinya; Hamamoto, Nao; Osaki, Masaki; Nakano, Satoshi; Miyakoshi, Chisato

Source: The Annals of thoracic surgery; Apr 2017; vol. 103 (no. 4); p. 1293-1298

Publication Date: Apr 2017

Publication Type(s): Journal Article

PubMedID: 27720369

Abstract:BACKGROUNDThe purpose of this study was to explore the prevalence, etiology, and risk factors of extubation failure (EF) in post-cardiac surgery neonates.METHODSNeonates (30 days old or younger) who underwent cardiac surgery and were admitted to the cardiac intensive care unit between September 2010 and February 2016 were included. The prevalence and etiology of EF, defined as reintubation within 48 hours, were reviewed. Demographic, operative, and perioperative data were retrospectively collected. Multiple logistic regression models were constructed to identify the risk factors for EF.RESULTSThe median age at surgery was 10 days. Extubation failure occurred in 25 of 156 cases (16.0%; 95% confidence interval: 10.6% to 22.7%), because of respiratory dysfunction (n = 16), hemodynamic instability (n = 4), upper airway obstruction (n = 4), or gastrointestinal bleeding (n = 1). Subsequent extubations were successful in 17 cases (68%) because of medical optimization of the causes of reintubation. The remaining 8 cases needed surgical reintervention, including tracheostomy and cardiac surgery. The inhospital mortality rate was 2.6%. In a bivariate analysis, younger age, airway diseases, ventilation before surgery, prolonged mechanical ventilation, and delayed sternal closure were associated with EF. The multivariable analysis identified airway diseases (adjusted odds ratio 18.2, 95% confidence interval: 3.8 to 88.6, p = 0.0003) and mechanical ventilation longer than 7 days (adjusted odds ratio 8.2, 95% confidence interval: 1.9 to 34.9, p = 0.0046) as risk factors for EF.CONCLUSIONSThe prevalence of EF is relatively high in neonatal cardiac surgery. The etiologies can be diverse. Extubation of neonates at high risk after cardiac surgery, based on these possible risk factors, requires more diligent approaches.

Database: Medline

13. Periictal activity in cooled asphyxiated neonates with seizures.

Author(s): Major, Philippe; Lortie, Anne; Dehaes, Mathieu; Lodygensky, Gregory Anton; Gallagher, Anne; Carmant, Lionel; Birca, Ala

Source: Seizure; Apr 2017; vol. 47 ; p. 13-16

Publication Date: Apr 2017

Publication Type(s): Journal Article

PubMedID: 28282552

Abstract:PURPOSESeizures are common in critically ill neonates. Both seizures and antiepileptic treatments may lead to short term complications and worsen the outcomes. Predicting the risks of seizure reoccurrence could enable individual treatment regimens and better outcomes. We aimed to identify EEG signatures of seizure reoccurrence by investigating periictal electrographic features and spectral power characteristics in hypothermic neonates with hypoxic-ischemic encephalopathy (HIE) with or without reoccurrence of seizures on rewarming.METHODSWe recruited five consecutive HIE neonates, submitted to continuous EEG monitoring, with high seizure burden (>20% per hour) while undergoing therapeutic hypothermia. Two of them had reoccurrence of seizures on rewarming. We performed quantitative analysis of fifteen artifact-free consecutive seizures to appreciate spectral power changes between the interictal, preictal and ictal periods, separately for each patient. Visual analysis allowed description of electrographic features associated with ictal events.RESULTSEvery patient demonstrated a significant increase in overall spectral power from the interictal to preictal and ictal periods ($p<0.01$). Alpha power increase was more pronounced in the two patients with reoccurrence of seizures on rewarming and significant when comparing both interictal-to-preictal and interictal-to-ictal periods. This alpha activity increase could be also appreciated using visual analysis and distinguished neonates with and without seizure reoccurrence.CONCLUSIONThis distinct alpha activity preceding ictal onset could represent a biomarker of propensity for seizure reoccurrence in neonates. Future studies should be performed to confirm whether quantitative

periictal characteristics and electrographic features allow predicting the risks of seizure reoccurrence in HIE neonates and other critically ill patients.

Database: Medline

14. A retrospective study of sedation and analgesic requirements of pediatric patients on extracorporeal membrane oxygenation (ECMO) from a single-center experience.

Author(s): Anton-Martin, Pilar; Modem, Vinai; Taylor, Donna; Potter, Donald; Darnell-Bowens, Cindy

Source: Perfusion; Apr 2017; vol. 32 (no. 3); p. 183-191

Publication Date: Apr 2017

Publication Type(s): Journal Article Observational Study

PubMedID: 27729502

Abstract:INTRODUCTIONThe purpose of this study is to describe the sedative and analgesic requirements identifying factors associated with medication escalation in neonates and children supported on ECMO.METHODObservational retrospective cohort study in a tertiary pediatric intensive care unit from June 2009 to June 2013.RESULTSOne hundred and sixty patients were included in the study. Fentanyl and midazolam were the first line agents used while on ECMO. Higher opiate requirements were associated with younger age (p=0.01), thoracic cannulation (p=0.002), the use of dexmedetomidine (p=0.007) and prolonged use of muscle relaxants (p=0.03). Higher benzodiazepine requirements were associated with younger age (p=0.01), respiratory failure (p=0.02) and the use of second line agents (p=0.002). One third of the patients required second line agents as adjuvants for comfort without a decrease in opiate and/or benzodiazepine requirements.CONCLUSIONSProviding comfort to subpopulations of pediatric ECMO patients seems to be more challenging. The use of second line agents did not improve comfort in our cohort. Prospective studies are required to optimize analgesia and sedation management in children on ECMO.

Database: Medline

15. Risk Factors for Extubation Failure in Extremely Low Birth Weight Infants.

Author(s): Wang, Shih-Hsin; Liou, Jyun-You; Chen, Chien-Yi; Chou, Hung-Chieh; Hsieh, Wu-Shiun; Tsao, Po-Nien

Source: Pediatrics and neonatology; Apr 2017; vol. 58 (no. 2); p. 145-150

Publication Date: Apr 2017

Publication Type(s): Journal Article

PubMedID: 27349301

Abstract:BACKGROUNDAlthough antenatal steroids and early use nasal continuous positive airway pressure (NCPAP) have significantly improved outcomes of neonatal respiratory distress syndrome, intubation with ventilator support is still commonly required in extremely low birth weight (ELBW) infants. The optimal timing of extubation in ELBW infants remains unclear.METHODSWe retrospectively analyzed all ELBW preterm infants who were admitted to our neonatal intensive care unit (NICU) from January 2009 to December 2013. Demographic, ventilation, and arterial blood gas analysis results prior to and 2 hours after extubation were collected. Extubation failure was defined as reintubation due to deterioration of respiratory condition within 7 days after extubation. Risk factors for extubation failure were analyzed.RESULTSIn total, 173 ELBW infants were born and admitted to our NICU during these 5 years. Among these 173 infants, 77 (44.5%) used NCPAP only during their hospitalization (20 diagnosed with chronic lung disease (CLD), 25.9%). Among the 95

patients that required intubation, 27 patients expired so extubation was not attempted. Sixteen of 68 (23.5%) survival cases required reintubation within 7 days after extubation. We found that gestational age, birth body weight, and sex ratio did not differ between the successful extubation group and the failed extubation group. Univariate analysis showed that the failed extubation group had a lower arterial pH right before and 2 hours after extubation, with a lower bicarbonate level after extubation. Further multivariate logistic regression analysis revealed an association between poor acid-base homeostasis 2 hours after extubation (pH < 7.3 and HCO3 < 18 mM/L) and extubation failure (odds ratio 4.56 and 6.187 and 95% confidence interval: 1.263∼16.462 and 1.68∼22.791, respectively).CONCLUSIONThis study shows that nearly half of ELBW infants do not require intubation. Among ELBW infants who require invasive ventilator support, those who have lower postextubation arterial pH and bicarbonate levels are at high risk of extubation failure.

Database: Medline

16. Probiotics Prevent Candida Colonization and Invasive Fungal Sepsis in Preterm Neonates: A Systematic Review and Meta-Analysis of Randomized Controlled Trials.

Author(s): Hu, Hua-Jian; Zhang, Guo-Qiang; Zhang, Qiao; Shakya, Shristi; Li, Zhong-Yue

Source: Pediatrics and neonatology; Apr 2017; vol. 58 (no. 2); p. 103-110

Publication Date: Apr 2017

Publication Type(s): Meta-analysis Journal Article Review

PubMedID: 27793494

Abstract: To investigate whether probiotic supplementation could reduce the risk of fungal infection in preterm neonates in neonatal intensive care units (NICUs), we systematically searched PubMed, EMBASE, and the Cochrane Central Register of Controlled Trials databases for randomized controlled trials (RCTs) focusing on the effect of probiotics on fungal infection in preterm neonates. The outcomes of interest were Candida colonization and invasive fungal sepsis. Seven trials involving 1371 preterm neonates were included. Meta-analysis (fixed-effects model) showed that probiotic supplementation was significantly associated with a lower risk of Candida colonization (2 RCTs, n = 329; relative risk (RR), 0.43; 95% confidence interval (CI), 0.27-0.67; p = 0.0002; I2 = 0%), and invasive fungal sepsis (7 RCTs, n = 1371; RR, 0.64; 95% CI, 0.46-0.88; p = 0.006; I2 = 13%). After excluding one study with a high baseline incidence (75%) of fungal sepsis, the effect of probiotics on invasive fungal sepsis became statistically insignificant (RR, 0.88; 95% CI, 0.44-1.78; p = 0.72; I2 = 15%). When using the random-effects model, the effect of probiotics remained favorable for Candida colonization (RR, 0.43; 95% CI 0.27-0.68; p = 0.0002; I2 = 0%) but not for fungal sepsis (RR, 0.64; 95% CI 0.38-1.08; p = 0.10; I2 = 13%). Current evidence indicates that probiotics can reduce the risk of Candida colonization in preterm neonates in NICUs. Limited data support that probiotic supplementation prevents invasive fungal sepsis in preterm neonates. High-quality and adequately powered RCTs are warranted.

Database: Medline

17. Improved method for the detection of catheter colonization and catheter-related bacteremia in newborns.

Author(s): Martín-Rabadán, P; Pérez-García, F; Zamora Flores, E; Nisa, E S; Guembe, M; Bouza, E

Source: Diagnostic microbiology and infectious disease; Apr 2017; vol. 87 (no. 4); p. 311-314

Publication Date: Apr 2017

Publication Type(s): Journal Article Observational Study

PubMedID: 28129948

Abstract: Accurate diagnosis of catheter-related bloodstream infection (CRBSI) is mandatory for hospital infection control. Peripherally inserted central venous catheters (PICCs) are widely used in intensive care units, but studies about procedures for detection of colonization are scarce in neonates. We sequentially processed 372 PICCs by 2 methods, first by the standard roll-plate (RP) technique and then by rubbing catheters on a blood agar plate after being longitudinally split (LS). With both techniques, we detected 133 colonized PICCs. Ninety-four events of CRBSI were diagnosed. The sensitivity, specificity, positive predictive value, and negative predictive value for detection of CRBSI were 58.5%, 92.8%, 73.3%, and 86.9%, respectively, for RP technique and 96.8%, 88.5%, 74.0%, and 98.8%, respectively, for LS technique. The LS technique increased the proportion of detected CRBSI by 38.3%. Neonatal PICC tips should be cultured after cutting them open. This technique is simple and sensitive to detect catheter colonization and also to diagnose CRBSI.

Database: Medline

18. Corticokinematic coherence as a new marker for somatosensory afference in newborns.

Author(s): Smeds, Eero; Vanhatalo, Sampsa; Piitulainen, Harri; Bourguignon, Mathieu; Jousmäki, Veikko; Hari, Riitta

Source: Clinical neurophysiology : official journal of the International Federation of Clinical Neurophysiology; Apr 2017; vol. 128 (no. 4); p. 647-655

Publication Date: Apr 2017

Publication Type(s): Journal Article Evaluation Studies

PubMedID: 28237690

Abstract:OBJECTIVESomatosensory evoked potentials have high prognostic value in neonatal intensive care, but their recording from infants is challenging. Here, we studied the possibility to elicit cortical responses in newborns by simple passive hand movements.METHODSWe examined 13 newborns (postnatal age 1-46days) during clinically indicated 19-channel electroencephalography (EEG) recordings in the neonatal intensive care unit; EEG indications included birth asphyxia and suspected epileptic seizures. The experimenter moved the infant's wrist or fingers at 1 or 2Hz for 5-10min, separately on both sides. We measured movement kinematics with an accelerometer attached to the infant's hand and computed coherence between the EEG and acceleration signals (corticokinematic coherence, CKC).RESULTSStatistically significant CKC (amplitude 0.020-0.511) with characteristic scalp topography was observed in all infants at twice the movement frequency. CKC was contralaterally dominant on the central scalp (median laterality index 0.48 for right-hand and -0.63 for left-hand movements).CONCLUSIONSPassive movements elicit cortical responses that can be readily observed in clinical EEG recordings from newborns in the intensive-care environment.SIGNIFICANCECKC is a novel, noninvasive marker for the somatosensory system. Its robustness and practical ease make it attractive for bedside assessment of neurologically compromised newborns.

Database: Medline

19. Exposure to any antenatal corticosteroids and outcomes in preterm infants by gestational age: prospective cohort study.

Author(s): Travers, Colm P; Clark, Reese H; Spitzer, Alan R; Das, Abhik; Garite, Thomas J; Carlo, Waldemar A

Source: BMJ (Clinical research ed.); Mar 2017; vol. 356 ; p. j1039

Publication Date: Mar 2017

Publication Type(s): Journal Article

PubMedID: 28351838

Available in full text at The BMJ - from Highwire Press

Abstract: Objective To determine whether exposure to any antenatal corticosteroids is associated with a lower rate of death at each gestational age at which administration is currently recommended.Design Prospective cohort study.Settings 300 participating neonatal intensive care units of the Pediatrix Medical Group in the United States.Participants 117 941 infants 23 0/7 to 34 6/7 weeks' gestational age born between 1 January 2009 and 31 December 2013.Exposure Any antenatal corticosteroids.Main outcomes measures Death or major hospital morbidities analyzed by gestational age and exposure to antenatal corticosteroids with models adjusted for birth weight, sex, mode of delivery, and multiple births.Results Infants exposed to antenatal corticosteroids (n=81 832) had a significantly lower rate of death before discharge at each gestation 29 weeks or less, 31 weeks, and 33-34 weeks compared with infants without exposure (range of adjusted odds ratios 0.32 to 0.55). The number needed to treat with antenatal corticosteroids to prevent one death before discharge increased from six at 23 and 24 weeks' gestation to 798 at 34 weeks' gestation. The rate of survival without major hospital morbidity was higher among infants exposed to antenatal corticosteroids at the lowest gestations. Infants exposed to antenatal corticosteroids had lower rates of severe intracranial hemorrhage or death, necrotizing enterocolitis stage 2 or above or death, and severe retinopathy of prematurity or death compared with infants without exposure at all gestations less than 30 weeks and most gestations for infants born at 30 weeks' gestation or later.Conclusion Among infants born from 23 to 34 weeks' gestation, antenatal exposure to corticosteroids compared with no exposure was associated with lower mortality and morbidity at most gestations. The effect size of exposure to antenatal corticosteroids on mortality seems to be larger in infants born at the lowest gestations.

Database: Medline

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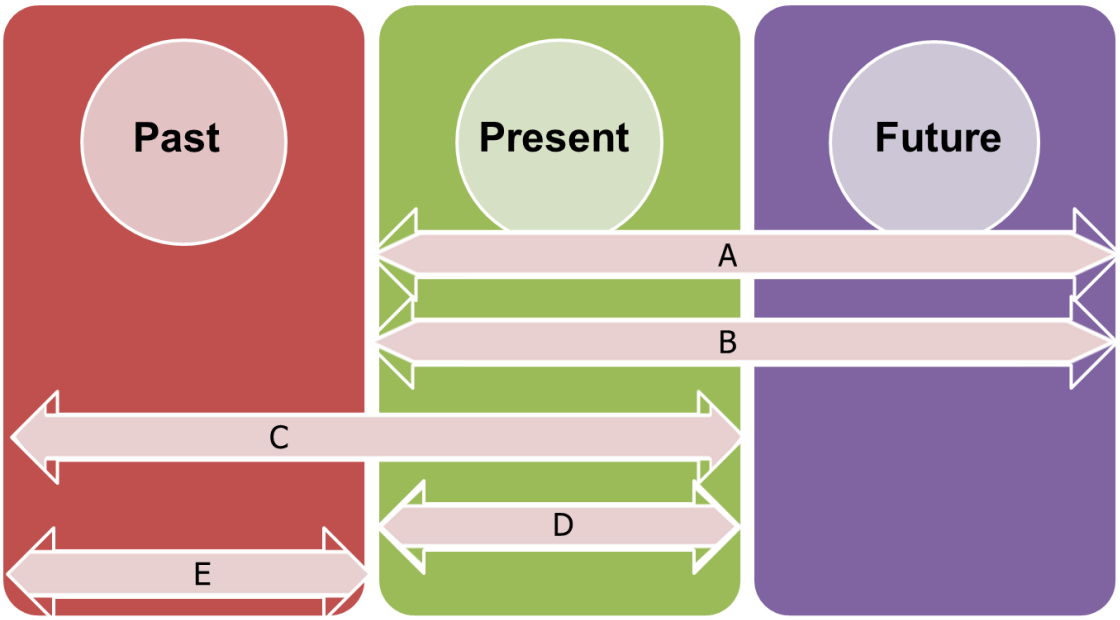
Exercise: Study Design Timeframes

Match the study design with the timeframe it covers.



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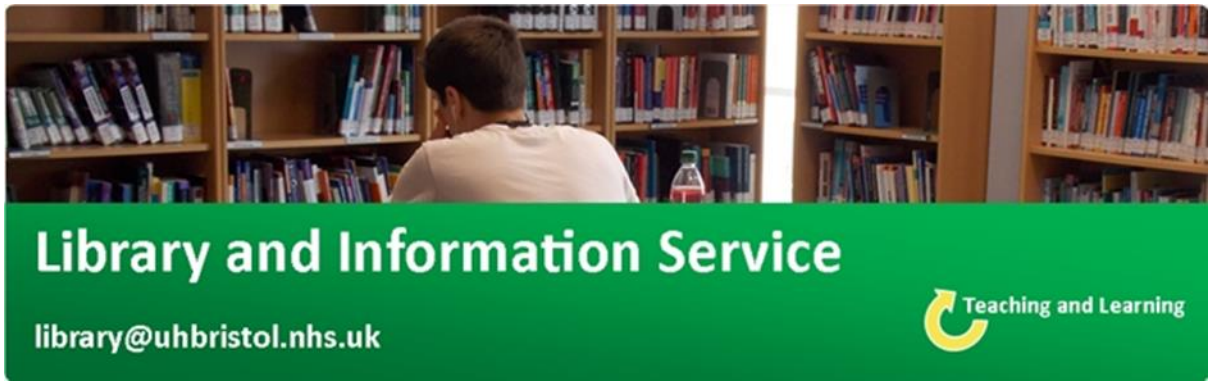

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