

NICU

Evidence Update

December 2017
(Quarterly)



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Training Calendar 2017/18

All sessions are one hour

December (12.00-13.00)

7 th (Thu)	Statistics
14 th (Thu)	Literature Searching
20 th (Wed)	Critical Appraisal

January (13.00-14.00)

4 th (Thu)	Statistics
8 th (Mon)	Literature Searching
18 th (Thu)	Critical Appraisal
24 th (Wed)	Statistics

February (12.00-13.00)

1 st (Thu)	Literature Searching
9 th (Fri)	Critical Appraisal
12 th (Mon)	Statistics
20 th (Tue)	Literature Searching
28 th (Wed)	Critical Appraisal

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Updates

NICE National Institute for
Health and Care Excellence

[The emotional impact of errors or adverse events on healthcare providers in the NICU: The protective role of coworker support](#)

Source: [Medicines Management Collection](#) - 26 July 2017 - Publisher: Journal Of Advanced Nursing

AIMS: To examine the impact of errors or adverse events on emotional distress and professional quality of life in healthcare providers in the neonatal

[Rudeness and Medical Team Performance](#)

Source: [Cochrane Central Register of Controlled Trials](#) - 01 January 2017 - Publisher: Pediatrics

METHODS: Thirty-nine NICU teams participated in a training workshop including simulations of acute care of term and preterm newborns. In...

[A global perspective of the roles of the pharmacist in the NICU](#)

Source: [Medicines Management Collection](#) - 23 June 2016 - Publisher: International Journal of Pharmacy Practice

pharmacist practice and roles performed in the neonatal intensive care unit (NICU) worldwide and to map these findings along the...



[Fluid supplementation for neonatal unconjugated hyperbilirubinaemia.](#)

Lai NM. *Cochrane Database of Systematic Reviews* 2017;(8):CD011891.

[There is no evidence that intravenous fluid supplementation affected major clinical outcomes such as acute- or long-term brain problems associated with excessive bilirubin in healthy, full-term newborn infants, mainly because the baseline risk of developing such problems was very low in this group of infants.]

[Oral dextrose gel to prevent hypoglycaemia in at-risk neonates.](#)

Hegarty JE. *Cochrane Database of Systematic Reviews* 2017;(7):CD012152.

[During searches updated to January 2017, we found one study (with low risk of bias) that compared oral dextrose gel versus placebo for prevention of low blood glucose levels in 415 at-risk babies.

Evidence from this single study suggests that in babies at risk, oral dextrose gel followed by a feed is associated with reduced risk of low blood glucose levels when compared with placebo (high-quality evidence).]

[High versus standard volume enteral feeds to promote growth in preterm or low birth weight infants.](#)

Abiramalatha T. *Cochrane Database of Systematic Reviews* 2017;(9):CD012413.

[We found only very limited data from one small unblinded trial on the effects of high-volume feeds on important outcomes for preterm or low birth weight infants. The quality of evidence is low to very low. Hence, available evidence is insufficient to support or refute high-volume enteral feeds in preterm or low birth weight infants.]

[Cerebral near-infrared spectroscopy monitoring for prevention of brain injury in very preterm infants.](#)

Hyttel-Sorensen S. *Cochrane Database of Systematic Reviews* 2017;(9):CD011506.

[The single trial we found showed a large and significant difference in brain oxygenation between the experimental group and the control group. Low oxygenation was far more common in the control group. The accrued information size with one small randomised trial is too small to conclude anything about the benefits and harms of cerebral near-infrared spectroscopy in preterm infants. Thus further studies are needed.]

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Buccal dextrose gel for neonatal hypoglycemia (November 2017)

In a subsequent analysis of data from a randomized trial of neonates (gestational age 35 to 42 weeks) at risk for hypoglycemia in the first 48 hours after birth, administration of buccal dextrose gel was associated with a greater increase in blood glucose level than placebo gel in hypoglycemic infants who were breast-fed, formula-fed, or fed expressed breast milk [20]. Breast-fed infants were less likely to have recurrent episodes of hypoglycemia. For asymptomatic infants with hypoglycemia, buccal administration of dextrose gel 200 mg/kg followed by breast-feeding is a reasonable intervention. (See "[Management and outcome of neonatal hypoglycemia](#)", section on 'Dextrose gel'.)

Childhood executive and visual motor function after neonatal hypoglycemia (November 2017)

In a follow-up report of a prospective study of newborns at risk for hypoglycemia, assessment performed at 4.5 years of age demonstrated an increased risk of poor executive and visual motor function among children treated for neonatal hypoglycemia compared with those without neonatal hypoglycemia [21]. The highest risk was in children who had severe,

recurrent, or clinically undetected hypoglycemia for >10 minutes. The risk of combined neurosensory impairment was similar in the two groups. This study underscores the challenges of determining when intervention for neonatal hypoglycemia should be initiated to avoid long-term morbidity. (See ["Management and outcome of neonatal hypoglycemia", section on 'Asymptomatic hypoglycemia'](#) and ["Pathogenesis, screening, and diagnosis of neonatal hypoglycemia", section on 'Challenge of defining neonatal hypoglycemia'.](#))

Delayed cord clamping in preterm infants (November 2017)

Delayed cord clamping has been recommended for vigorous preterm infants to decrease infant morbidity and increase iron stores, based on meta-analyses of a few small randomized trials. Now, the largest randomized trial of delayed versus immediate cord clamping in over 1500 infants <30 weeks of gestation found no reduction in death or major morbidity from the intervention [22]. There was no clear reason for the discordancy from previous trials. We delay cord clamping for at least 30 seconds in vigorous preterm infants but believe clinicians should use their judgment about whether and how long to delay cord clamping in individual preterm infants until definitive data are available. (See ["Management of normal labor and delivery", section on 'Cord clamping'.](#))

Papers

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1. The Neonatal Microbiome: Implications for Neonatal Intensive Care Unit Nurses.

Author(s): Rodriguez, Jeannie; Jordan, Sheila; Mutic, Abby; Thul, Taylor

Source: MCN. The American journal of maternal child nursing; ; vol. 42 (no. 6); p. 332-337

Publication Type(s): Journal Article

PubMedID: 29049058

Abstract: Nursing care of the neonate in the neonatal intensive care unit (NICU) is complex, due in large part to various physiological challenges. A newer and less well-known physiological consideration is the neonatal microbiome, the community of microorganisms, both helpful and harmful, that inhabit the human body. The neonatal microbiome is influenced by the maternal microbiome, mode of infant birth, and various aspects of NICU care such as feeding choice and use of antibiotics. The composition and diversity of the microbiome is thought to influence key health outcomes including development of necrotizing enterocolitis, late-onset sepsis, altered physical growth, and poor neurodevelopment. Nurses in the NICU play a key role in managing care that can positively influence the microbiome to promote more optimal health outcomes in this vulnerable population of newborns.

Database: Medline

2. Outcomes of Preterm Infants following Discussions about Withdrawal or Withholding of Life Support.

Author(s): James, Jennifer; Munson, David; DeMauro, Sara B; Langer, John C; Dworetz, April R; Natarajan, Girija; Bidegain, Margarita; Fortney, Christine A; Seabrook, Ruth; Vohr, Betty R; Tyson, Jon E; Bell, Edward F; Poindexter, Brenda B; Shankaran, Seetha; Higgins, Rosemary D; Das, Abhik; Stoll, Barbara J; Kirpalani, Haresh; Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network

Source: The Journal of pediatrics; Nov 2017; vol. 190 ; p. 118

Publication Date: Nov 2017

Publication Type(s): Clinical Trial Multicenter Study Journal Article

PubMedID: 28647272

Abstract: OBJECTIVE To describe the frequency of postnatal discussions about withdrawal or withholding of life-sustaining therapy (WWLST), ensuing WWLST, and outcomes of infants surviving such discussions. We hypothesized that such survivors have poor outcomes. STUDY DESIGN This retrospective review included registry data from 18 centers of the National Institute of Child Health and Human Development Neonatal Research Network. Infants born at 22-28 weeks of gestation who survived >12 hours during 2011-2013 were included. Regression analysis identified maternal and infant factors associated with WWLST discussions and factors predicting ensuing WWLST. In-hospital and 18- to 26-month outcomes were evaluated. RESULTS WWLST discussions occurred in 529 (15.4%) of 3434 infants. These were more frequent at 22-24 weeks (27.0%) compared with 27-28 weeks of gestation (5.6%). Factors associated with WWLST discussion were male sex, gestational age (GA) of ≤24 weeks, birth weight small for GA, congenital malformations or syndromes, early onset sepsis,

severe brain injury, and necrotizing enterocolitis. Rates of WWLST discussion varied by center (6.4%-29.9%) as did WWLST (5.2%-20.7%). Ensuing WWLST occurred in 406 patients; of these, 5 survived to discharge. Of the 123 infants for whom intensive care was continued, 58 (47%) survived to discharge. Survival after WWLST discussion was associated with higher rates of neonatal morbidities and neurodevelopmental impairment compared with babies for whom WWLST discussions did not occur. Significant predictors of ensuing WWLST were maternal age >25 years, necrotizing enterocolitis, and days on a ventilator. **CONCLUSIONS** Wide center variations in WWLST discussions occur, especially at ≤ 24 weeks GA. Outcomes of infants surviving after WWLST discussions are poor. **TRIAL REGISTRATION** ClinicalTrials.gov: NCT00063063.

Database: Medline

3. Early Caffeine Prophylaxis and Risk of Failure of Initial Continuous Positive Airway Pressure in Very Low Birth Weight Infants.

Author(s): Patel, Ravi M; Zimmerman, Kanecia; Carlton, David P; Clark, Reese; Benjamin, Daniel K; Smith, P Brian

Source: The Journal of pediatrics; Nov 2017; vol. 190 ; p. 108

Publication Date: Nov 2017

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

PubMedID: 28890204

Abstract: **OBJECTIVE** To test the hypothesis that early caffeine treatment on the day of birth, compared with later treatment in very low birth weight (VLBW, <1500 g) infants receiving continuous positive airway pressure (CPAP) therapy, is associated with a decreased risk of CPAP failure in the first week of life. **STUDY DESIGN** Multicenter, observational cohort study in 366 US neonatal intensive care units. We evaluated inborn, VLBW infants discharged from 2000 to 2014, who received only CPAP therapy without surfactant treatment on day of life (DOL) 0, had a 5-minute Apgar ≥ 3 , and received caffeine in the first week of life. We used multivariable conditional logistic regression to compare the risk of CPAP failure, defined as invasive mechanical ventilation or surfactant therapy on DOL 1-6, by timing of caffeine treatment as either early (initiation on DOL 0) or routine (initiation on DOL 1-6). **RESULTS** We identified 11 133 infants; 4528 (41%) received early caffeine and 6605 (59%) received routine caffeine. Median gestational age was lower in the early caffeine group, 29 weeks (25th, 75th percentiles; 28, 30) vs the routine caffeine group, 30 weeks (29, 31); $P < 0.001$. The incidence of CPAP failure on DOL 1-6 was similar between the early and routine caffeine groups: 22% vs 21%; adjusted OR = 1.05 (95% CI: 0.93, 1.18). **CONCLUSION** Early caffeine treatment on the day of birth was not associated with a decreased risk of CPAP failure in the first week of life for VLBW infants initially treated with CPAP.

Database: Medline

4. Effect of Inhaled Nitric Oxide on Survival Without Bronchopulmonary Dysplasia in Preterm Infants: A Randomized Clinical Trial.

Author(s): Hasan, Shabih U; Potenziano, Jim; Konduri, Girija G; Perez, Jose A; Van Meurs, Krisa P; Walker, M Whit; Yoder, Bradley A; Newborns Treated With Nitric Oxide (NEWNO) Trial Group

Source: JAMA pediatrics; Nov 2017; vol. 171 (no. 11); p. 1081-1089

Publication Date: Nov 2017

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

PubMedID: 28973344

Available at [JAMA Pediatrics](#) - from EBSCO (MEDLINE Complete)

Abstract:ImportanceBronchopulmonary dysplasia (BPD) occurs in approximately 40% of infants born at younger than 30 weeks' gestation and is associated with adverse pulmonary and neurodevelopmental outcomes.ObjectiveTo test whether administration of inhaled nitric oxide to preterm infants requiring positive pressure respiratory support on postnatal days 5 to 14 improves the rate of survival without BPD.Design, Setting, and ParticipantsThis intent-to-treat study was a randomized clinical trial performed at 33 US and Canadian neonatal intensive care units. Participants included 451 neonates younger than 30 weeks' gestation with birth weight less than 1250 g receiving mechanical ventilation or positive pressure respiratory support on postnatal days 5 to 14. Enrollment spanned from December 23, 2009, to April 23, 2012, and neurodevelopmental outcome studies were completed by April 4, 2014.InterventionsPlacebo (nitrogen) or inhaled nitric oxide initiated at 20 ppm was decreased to 10 ppm between 72 and 96 hours after starting treatment and then to 5 ppm on day 10 or 11. Infants remained on the 5-ppm dose until completion of therapy (24 days).Main Outcomes and MeasuresThe primary outcome was the rate of survival without BPD at 36 weeks' postmenstrual age (PMA). Secondary outcomes included BPD severity, postnatal corticosteroid use, respiratory support, survival, and neurodevelopmental outcomes at 18 to 24 months' PMA.ResultsIn total, 222 infants (52.3% male [n = 116]) received placebo, and 229 infants (50.2% male [n = 115]) received inhaled nitric oxide. Their mean (SD) gestation was 25.6 (1.5) vs 25.6 (1.4) weeks, and their mean (SD) birth weight was 750 (164) vs 724 (160) g. Survival without BPD at 36 weeks' PMA was similar between the placebo and inhaled nitric oxide groups (31.5% [n = 70] vs 34.9% [n = 80]) (odds ratio, 1.17; 95% CI, 0.79-1.73). Rates for severe BPD (26.6% [55 of 207] vs 20.5% [43 of 210]) and postnatal corticosteroid use for BPD (41.0% [91 of 222] vs 41.5% [95 of 229]) and the mean (SD) days of positive pressure respiratory support (55 [40] vs 54 [42]), oxygen therapy (88 [41] vs 91 [59]), and hospitalization (105 [37] vs 108 [54]) were equivalent between the 2 groups. No differences in the incidence of common morbidities were observed. Respiratory outcomes on discharge to home, at 1 year, and at age 18 to 24 months' PMA and neurodevelopmental assessments at 18 to 24 months' PMA did not differ between groups.Conclusions and RelevanceInhaled nitric oxide, initiated at 20 ppm on postnatal days 5 to 14 to high-risk preterm infants and continued for 24 days, appears to be safe but did not improve survival without BPD at 36 weeks' PMA or respiratory and neurodevelopmental outcomes at 18 to 24 months' PMA.Trial Registrationclinicaltrials.gov Identifier: NCT00931632.

Database: Medline

5. Short-term and long-term outcomes of preterm neonates with acute severe pulmonary hypertension following rescue treatment with inhaled nitric oxide.

Author(s): Baczynski, Michelle; Ginty, Shannon; Weisz, Dany E; McNamara, Patrick J; Kelly, Edmond; Shah, Prakeshkumar; Jain, Amish

Source: Archives of disease in childhood. Fetal and neonatal edition; Nov 2017; vol. 102 (no. 6); p. F508

Publication Date: Nov 2017

Publication Type(s): Journal Article

PubMedID: 28483819

Available at [Archives of Disease in Childhood - Fetal and Neonatal Edition](#) - from BMJ Journals - NHS

Available at [Archives of Disease in Childhood - Fetal and Neonatal Edition](#) - from BMJ Journals

Abstract:OBJECTIVETo describe short-term and long-term outcomes of preterm neonates with severe acute pulmonary hypertension (aPHT) in relation to response to rescue inhaled nitric oxide (iNO) therapy.DESIGNRetrospective cohort studyover a 6 year period.SETTINGTertiary neonatal

intensive care unit. PATIENTS 89 neonates 3 days of age), early aPHT had a higher response rate to iNO (61% vs 11%; $p < 0.01$) and lower mortality (43% vs 78%; $p < 0.01$). CONCLUSION A positive response to rescue iNO in preterm infants with aPHT is associated with survival benefit, which is not offset by long-term disability.

Database: Medline

6. Emergency laparotomy in infants born at <26 weeks gestation: a neonatal network-based cohort study of frequency, surgical pathology and outcomes.

Author(s): Durell, Jonathan; Hall, Nigel J; Drewett, Melanie; Paramanatham, Kujan; Burge, David

Source: Archives of disease in childhood. Fetal and neonatal edition; Nov 2017; vol. 102 (no. 6); p. F504

Publication Date: Nov 2017

Publication Type(s): Journal Article

PubMedID: 28468896

Available at [Archives of Disease in Childhood - Fetal and Neonatal Edition](#) - from BMJ Journals - NHS

Available at [Archives of Disease in Childhood - Fetal and Neonatal Edition](#) - from BMJ Journals

Abstract: OBJECTIVE Identify the proportion of infants born at <26 completed weeks' gestation who require emergency laparotomy, and review the surgical pathology, incidence of subsequent surgical procedures and outcome. DESIGN Retrospective cohort review. SETTING Tertiary neonatal surgical unit. PATIENTS All infants born at <26 weeks' gestation in a neonatal network over an 8-year period. RESULTS Of 381 infants, laparotomy was indicated in 61 (16%) and performed in 57. Surgical pathology encountered included spontaneous intestinal perforation (SIP) (28), necrotising enterocolitis (NEC) (14), volvulus without malrotation (1), strangulated inguinal hernia (1), milk curd obstruction (4), NEC stricture (1) and meconium obstruction of prematurity (2). No intestinal pathology was found in six. Four infants with indications for laparotomy and severe comorbidity had intensive care withdrawn without surgery. The most frequent procedure performed was resection with primary anastomosis. Nine infants (16%) required more than one laparotomy. Of the 16 infants who had stoma formation, eight had closure before discharge. Fifteen infants required surgical patent ductus arteriosus ligation following laparotomy, and 17 had laser therapy for retinopathy of prematurity. Overall 42 infants with indication for laparotomy (69%) survived to discharge. CONCLUSIONS Nearly one in six infants born at <26 weeks required emergency laparotomy. The most frequent pathology encountered was SIP (49%), followed by NEC (25%). Over one-quarter required subsequent gastrointestinal surgery, with many also requiring cardiothoracic and ophthalmic procedures. These data are important for those caring for extremely preterm infants, the provision of information to parents and organisation of neonatal services.

Database: Medline

7. Abstention or intervention for isolated hypotension in the first 3 days of life in extremely preterm infants: association with short-term outcomes in the EPIPAGE 2 cohort study.

Author(s): Durrmeyer, Xavier; Marchand-Martin, Laetitia; Porcher, Raphaël; Gascoin, Geraldine; Roze, Jean-Christophe; Storme, Laurent; Favrais, Geraldine; Ancel, Pierre-Yves; Cambonie, Gilles; Hemodynamic EPIPAGE 2 Study Group

Source: Archives of disease in childhood. Fetal and neonatal edition; Nov 2017; vol. 102 (no. 6); p. 490-496

Publication Date: Nov 2017

Publication Type(s): Journal Article

PubMedID: 28302697

Available at [Archives of Disease in Childhood - Fetal and Neonatal Edition](#) - from BMJ Journals - NHS

Available at [Archives of Disease in Childhood - Fetal and Neonatal Edition](#) - from BMJ Journals

Abstract:OBJECTIVE To compare outcomes at hospital discharge for preterm infants born before 29 weeks of gestation who had at least one episode of isolated hypotension during their first 72 hours of life for which they did or did not receive antihypotensive treatment. DESIGN Etude Epidémiologique sur les Petits Ages Gestationnels 2 (EPIPAGE 2) French national prospective population-based cohort study in 2011. SETTING 60 neonatal intensive care units. PATIENTS All infants with a minimum mean arterial blood pressure less than gestational age (in weeks) ($\text{minMAP} < \text{GA}$) within 72 hours of birth. Infants whose reason for receiving antihypotensive treatments was isolated hypotension only were compared with untreated hypotensive infants by propensity score matching. TREATMENTS Fluid bolus and/or inotropes and/or corticosteroids. MAIN OUTCOMES AND MEASUREMENTS The primary outcome was survival at hospital discharge without major morbidity, defined as any of necrotising enterocolitis, severe cerebral abnormalities, severe bronchopulmonary dysplasia or severe retinopathy of prematurity. RESULTS Among the 1532 infants with available data, 662 had a $\text{minMAP} < \text{GA}$; 206 were treated for unknown or other reasons than isolated hypotension, 131 were treated for isolated hypotension only and 325 were untreated; 119 infants from each of these last two groups were matched. Treated infants had a significantly higher survival rate without major morbidity (61.3% vs 48.7%; OR, 1.67, 95% CI 1.00 to 2.78, $p=0.049$) and a lower rate of severe cerebral abnormalities (10.1% vs 26.5%, $p=0.002$). CONCLUSIONS In this population, antihypotensive treatment was associated with improved short-term outcomes. Therapeutic abstention should be cautiously considered for early isolated hypotension in extremely premature infants.

Database: Medline

8. Changes in the Diagnosis and Management of Patent Ductus Arteriosus from 2006 to 2015 in United States Neonatal Intensive Care Units.

Author(s): Bixler, G Michael; Powers, George C; Clark, Reese H; Walker, M Whit; Tolia, Veeral N

Source: The Journal of pediatrics; Oct 2017; vol. 189 ; p. 105-112

Publication Date: Oct 2017

Publication Type(s): Journal Article

PubMedID: 28600155

Abstract:OBJECTIVE To identify changes in the diagnosis, pharmacotherapy, and surgical ligation of patent ductus arteriosus (PDAs) in infants born premature and report on temporal changes in mortality and morbidity from a large volume of neonatal intensive care units (NICUs) in the US. STUDY DESIGN We queried the Pediatrix Clinical Data Warehouse for all inborn infants without major anomalies born between 23 and 30 weeks' gestation from 2006 to 2015 for a diagnosis of PDA, use of indomethacin or ibuprofen, history of ductal ligation, mortality, and major morbidities. RESULTS There were 829 091 infants entered in the Clinical Data Warehouse; 61 520 infants from 280 NICUs met our inclusion criteria. The diagnosis of PDA declined from 51% to 38% ($P < .001$), use of indomethacin or ibuprofen decreased from 32% to 18%, and PDA ligation decreased from 8.4% to 2.9% (both $P < .001$). During the study period, mortality decreased with no increase in any measured morbidity. Of the 163 sites with data for both periods, 128 (79%) showed a decrease in the diagnosis of PDA, and 132 (81%) showed a decrease in the use indomethacin and/or ibuprofen when 2011-2015 was compared with 2006-2010. Of 103 sites with at least 1 PDA ligation, 85 (83%) showed a decrease in PDA ligation in a similar comparison. CONCLUSIONS In this large population of infants <30 weeks' gestation from 280 NICUs across the US, there were significant

decreases in the diagnosis and treatment of the PDA. Although there was no evidence of increased morbidities, it remains uncertain how these changes may directly affect infant outcomes.

Database: Medline

9. The Relationship between High Flow Nasal Cannula Flow Rate and Effort of Breathing in Children.

Author(s): Weiler, Thomas; Kamerkar, Asavari; Hotz, Justin; Ross, Patrick A; Newth, Christopher J L; Khemani, Robinder G

Source: The Journal of pediatrics; Oct 2017; vol. 189 ; p. 66

Publication Date: Oct 2017

Publication Type(s): Clinical Trial Journal Article

PubMedID: 28669609

Abstract:OBJECTIVETo use an objective metric of effort of breathing to determine optimal high flow nasal cannula (HFNC) flow rates in children ≤ 8 kg.CONCLUSIONThe optimal HFNC flow rate to reduce effort of breathing in infants and young children is approximately 1.5-2.0 L/kg/minute with more benefit seen in children ≤ 8 kg.

Database: Medline

10. Distal skin vasodilation promotes rapid sleep onset in preterm neonates.

Author(s): Barcat, Lucile; Decima, Pauline; Bodin, Emilie; Delanaud, Stephane; Stephan-Blanchard, Erwan; Leke, Andre; Libert, Jean-Pierre; Tourneux, Pierre; Bach, Veronique

Source: Journal of sleep research; Oct 2017; vol. 26 (no. 5); p. 572-577

Publication Date: Oct 2017

Publication Type(s): Journal Article

PubMedID: 28303621

Abstract:Although sleep is of paramount importance for preterm neonates, care of the latter in a neonatal intensive care unit does not favour sleep. Given that several studies in adults have described a 'vegetative preparedness to sleep' (in which distal skin vasodilation before lights-out promotes rapid sleep onset), we looked at whether or not this process operates in preterm neonates. Sleep propensity was assessed in terms of the duration of a spontaneous episode of wakefulness (W). Skin temperatures at six body sites (the abdomen, pectoral region, eye, hand, thigh and foot) were measured (using infrared thermography) during nocturnal polysomnography in 29 9-day-old preterm neonates (postmenstrual age: 209 ± 9 days). We then determined whether the duration of the W episode depended upon the local skin temperatures measured at the start, during and end of the episode. The W episode was shorter when distal skin temperatures (thigh, hand and foot) and the pectoral temperature were higher at the end of the episode (i.e. at sleep onset). The relationship with the duration of the W episode was not significant for temperatures measured at the start of the W episode. We observed gradual distal vasodilation at the pectoral region, the thigh, hand and foot (i.e. affecting most of the body's skin surface) during W episodes. Our results constitute initial evidence to show that distal vasodilation may have a key role in facilitating sleep onset in very preterm neonates.

Database: Medline

11. Complexity of brain signals is associated with outcome in preterm infants.

Author(s): Sortica da Costa, Cristine; Placek, Michal M; Czosnyka, Marek; Cabella, Brenno; Kasprowicz, Magdalena; Austin, Topun; Smielewski, Peter

Source: Journal of cerebral blood flow and metabolism : official journal of the International Society of Cerebral Blood Flow and Metabolism; Oct 2017; vol. 37 (no. 10); p. 3368-3379

Publication Date: Oct 2017

Publication Type(s): Journal Article

PubMedID: 28075691

Abstract: A characteristic feature of complex healthy biological systems is the ability to react and adapt to minute changes in the environment. This 'complexity' manifests itself in highly irregular patterns of various physiological measurements. Here, we apply Multiscale Entropy (MSE) analysis to assess the complexity of systemic and cerebral near-infrared spectroscopy (NIRS) signals in a cohort of 61 critically ill preterm infants born at median (range) gestational age of 26 (23-31) weeks, before 24 h of life. We further correlate the complexity of these parameters with brain injury and mortality. Lower complexity index (Col) of oxygenated haemoglobin (HbO₂), deoxygenated haemoglobin (Hb) and tissue oxygenation index (TOI) were observed in those infants who developed intraventricular haemorrhage (IVH) compared to those who did not ($P = 0.002$, $P = 0.010$ and $P = 0.038$, respectively). Mean Col of HbO₂, Hb and total haemoglobin index (THI) were lower in those infants who died compared to those who survived ($P = 0.012$, $P = 0.004$ and $P = 0.003$, respectively). Col-HbO₂ was an independent predictor of IVH ($P = 0.010$). Decreased complexity of brain signals was associated with mortality and brain injury. Measurement of brain signal complexity in preterm infants is feasible and could represent a significant advance in the brain-oriented care.

Database: Medline

[Hexavalent 6-in-1 vaccine to be made available to newborn babies](#)

All babies born on or after 1 August 2017 will be offered protection against hepatitis B as part of our universal childhood immunisation programme, Public Health England has announced. This is in addition to continued protection against diphtheria, tetanus, pertussis, polio and Hib.

[The impact of the Neonatal Intensive Care Unit on sensory and developmental outcomes in infants born preterm: A scoping review.](#)

Philpott-Robinson K. British Journal of Occupational Therapy 2017;80(8):459 - 469. [Preterm infants admitted to the Neonatal Intensive Care Unit are at higher risk of poor neurodevelopmental and sensory outcomes. There is interest in establishing whether elements of the Neonatal Intensive Care Unit sensory environment may influence the sensory and overall development of these infants.]

[Non-publication and Discontinuation of Randomised Controlled Trials in Newborns](#)

Christoph M Rügger, Jennifer A Dawson, Susan M Donath, Louise S Owen and Peter G Davis

Accepted manuscript online: 4 SEP 2017 08:55PM EST | DOI: 10.1111/apa.14062



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November 2017 – Volume 102 – Issue 6

[Neonatology](#)

November 2017 – Volume 112 – Issue 4

[Journal of Pediatrics](#)

December 2017 – Volume 191

[JAMA Pediatrics](#)

November 2017 – Volume 171 – Issue 11

[Pediatrics](#)

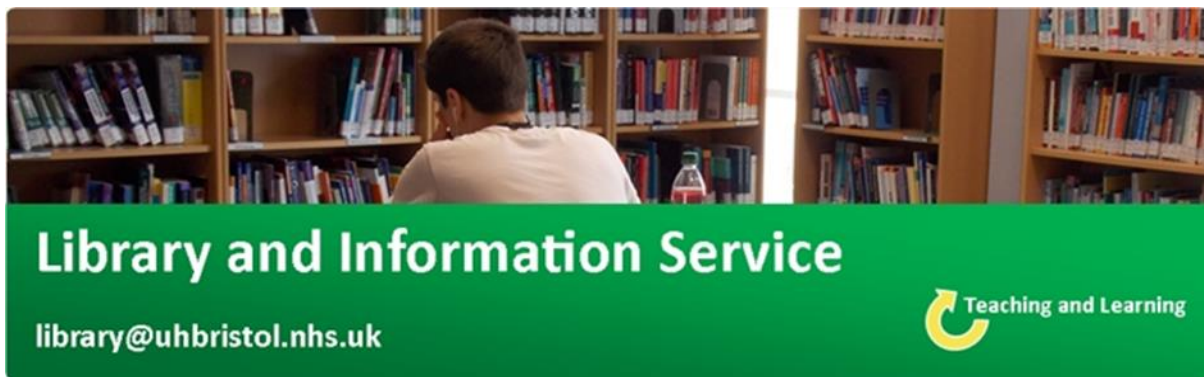
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