University Hospitals Bristol NHS
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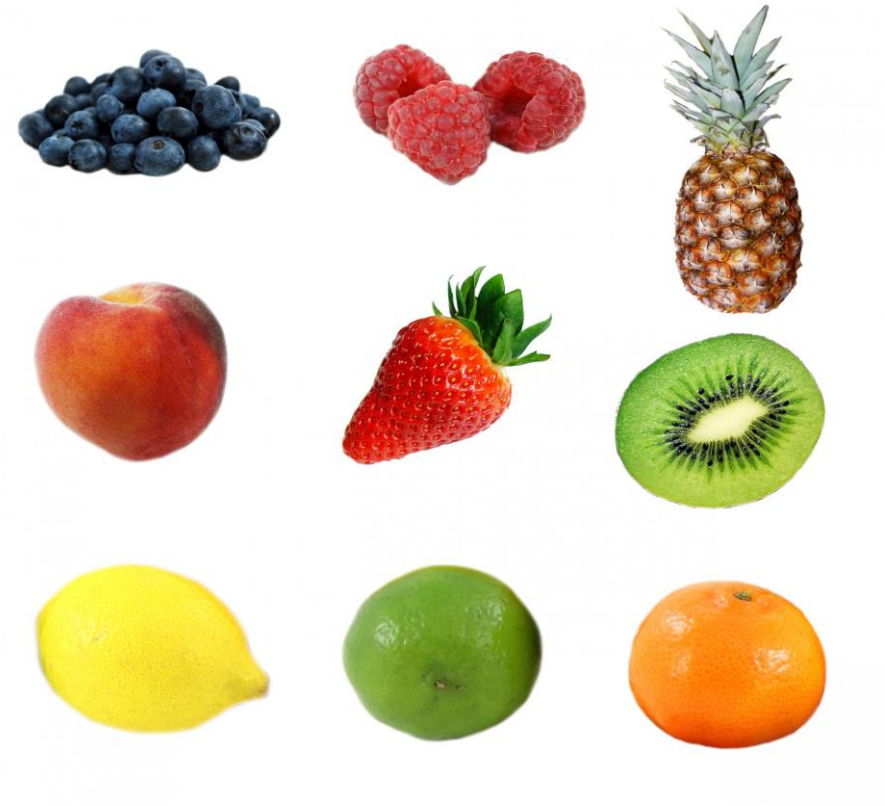
Paediatric Nutrition

Evidence Update



November 2017
(Quarterly)

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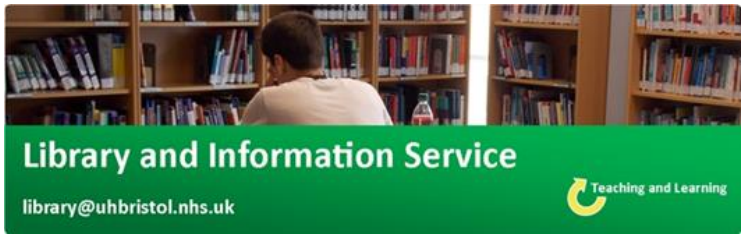

Training Calendar 2017

All sessions are one hour

November (13.00)

2nd Thu	**Literature Searching**
10th Fri	**Critical Appraisal**
13th Mon	**Statistics**
21st Tues	**Literature Searching**
29th Wed	**Critical Appraisal**

December (12.00)

7th Thu	**Statistics**
15th Fri	**Literature Searching**

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Journal Tables of Contents

Click on the **journal title (+ Ctrl)** for the most recent tables of contents.

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American Journal of Clinical Nutrition
October 1, 2017, Volume 106, Issue 4

Journal of Human Nutrition & Dietetics
October 2017, Volume 30, Issue 5

Journal of the Academy of Nutrition and Dietetics
November 2017, Volume 117, Issue 11

Gut
November 2017, Volume 66, Issue 11

BMJ
November 2017

Lancet
October 28 2017, Volume 390, Issue 10106

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Updates

NICE National Institute for Health and Care Excellence
Nothing relevant to add

Cochrane Library
Nothing relevant to add

UpToDate®
Nothing to add relevant

Other – NHS 'Behind the Headlines', Guidance etc
Some babies should be given peanuts early say new US guidelines Friday January 6 2017

Database Articles

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

2. Systematic Review of the Effect of Enteral Feeding on Gut Microbiota in Preterm Infants.

Author(s): Xu, Wanli; Judge, Michelle; Maas, Kendra; Hussain, Naveed; McGrath, Jacqueline M; Henderson, Wendy A; Cong, Xiaomei

Source: Journal of obstetric, gynecologic, and neonatal nursing : JOGNN; Oct 2017

Publication Date: Oct 2017

Publication Type(s): Journal Article

PubMedID: 29040820

Abstract:OBJECTIVETo examine the effect of feeding type on microbial patterns among preterm infants and to identify feeding factors that promote the colonization of beneficial bacteria.DATA SOURCESPubMed, Cochrane Database of Systematic Reviews, Scopus, and the Cummulative Index of Nursing and Allied Health Literature were thoroughly searched for articles published between January 2000 and January 2017, using the keywords gut microbiome, gut microbiota, enteral microbiome, enteral microbiota, premature infant, preterm infant, extremely low birth weight infant, ELBW infant, very low birth weight infant, feeding, breast milk, breastfeeding, formula, prebiotic, probiotic, and long chain polyunsaturated fatty acid.STUDY SELECTIONPrimary studies written in English and focused on the association between enteral feeding and gut microbiome patterns of preterm infants were included in the review.DATA EXTRACTIONWe independently reviewed the selected articles and extracted information using predefined data extraction criteria including study design, study participants, type of feeding, type and frequency of biospecimen collection, microbiological analysis method, and major results.DATA SYNTHESISIn 4 of the 18 studies included in the review, researchers described the effects of milk products (mothers' own milk, donor human milk, and formula). In 5 studies, the effects of prebiotics were assessed, and in 9 studies, the effects of probiotics on the gut microbiome were described. Mothers' own breast milk feeding influenced the compositional structure of preterm infants' gut microbial community and increased diversity of gut microbiota compared with donor human milk and formula feeding. The results of the use of prebiotics and probiotics varied among studies; however, the majority of the researchers reported positive bifidogenic effects on the development of beneficial bacteria.CONCLUSIONMothers' own milk is considered the best form of nutrition for preterm infants and the gut microbial community. Variation in fatty acid composition across infant feeding types can affect microbial composition. The evidence for supplementation of prebiotics and probiotics to promote the gut microbial community structure is compelling; however, additional research is needed in this area.

3. Safety and efficacy of uninterrupted perioperative enteral feeding in pediatric burn patients.

Author(s): Imeokparia, Folasade; Johnson, Morgan; Thakkar, Rajan K; Giles, Sheila; Capello, Teresa; Fabia, Renata

Source: Burns : journal of the International Society for Burn Injuries; Oct 2017

Publication Date: Oct 2017

Publication Type(s): Journal Article

PubMedID: 29032966

Abstract:INTRODUCTIONBurn injuries are a significant cause of morbidity. Early enteral nutrition has been shown to improve outcomes, however enteral nutrition is often held for procedures receiving general anesthesia. Limited data is available on uninterrupted perioperative nutrition in pediatric burn patients.METHODSA single, American Burn Association verified burn center database was queried for patients ≤18 years of age with ≥15% total body surface area (TBSA) burn injuries who underwent surgeries with general anesthesia. Demographic and clinical details were analyzed comparing patients who were fed continuously and those with interrupted feeds.RESULTSThirty-one patients met inclusion criteria. Eighteen had continuous feeds and thirteen had interrupted feeds. We found perioperative enteral feeds safe as there were no aspiration events in these patients. Patients with interrupted feeds lost an average of 119.1kcal/kg and 1.4days of estimated energy needs. This was a 125% fall below metabolic needs. This loss was more pronounced with multiple operations and for patients <30kg. Patients with continuous feeds gained an average of 144.4kcal/kg and 1.7days of estimated energy needs. These patients surpassed metabolic needs by 173%. Again, this had the biggest impact in patients with multiple operations and those <30kg.CONCLUSIONSThe metabolic demands of burn patients are above most critically ill patients. To meet these demands, we implemented uninterrupted perioperative feeding. There were no aspiration events. Continuous feeds were an effective means to achieve caloric demands and moderate catabolic injury. We demonstrated safety and efficacy of uninterrupted perioperative feeding of pediatric burn patients.

4. Postoperative Feeding Regimens After Laparoscopic Gastrostomy Placement.

Author(s): Rosenfeld, Eric H; Mazzolini, Kirea; DeMello, Annalyn; Yu, Yangyang R; Lee, Timothy C; Naik-Mathuria, Bindi; Mazziotti, Mark V; Shah, Sohail R

Source: Journal of laparoendoscopic & advanced surgical techniques. Part A; Oct 2017

Publication Date: Oct 2017

Publication Type(s): Journal Article

PubMedID: 28969523

Abstract:PURPOSEThe objective of this study was to evaluate postoperative feeding regimens after laparoscopic gastrostomy placement and their effect on outcomes.METHODSChildren 18 years of age or younger, who underwent laparoscopic gastrostomy placement at a tertiary-care academic children's hospital between January 2014 and October 2016, were reviewed. Data collected included patient characteristics, postoperative feeding regimen, and clinical outcomes. Statistical analysis was performed using Chi-square, Fisher's exact, and Wilcoxon Rank-Sum tests.RESULTSWe reviewed the medical records of 270 children that underwent laparoscopic gastrostomy placement by 15 pediatric surgeons. The median age was 2.7 (interquartile range [IQR], 0.7-9.6) years, and 50% (n = 136) were male. The median body mass index was 15.5 (IQR, 14.0-17.5). Complications within 90 days included: granulation tissue (34%), leakage (17%), dislodgement (14%), and skin and soft-tissue infection (9%). Two patients returned to the operating room, 1 for a dislodged tube, and another for a volvulus within 10 days of gastrostomy tube placement. A subset analysis of outpatients that underwent elective laparoscopic gastrostomy placement showed variation in the day of initial feeds (0-2 postoperative days [POD]), method of initial feeds (continuous versus bolus) and choice of initial

feeds (Pedialyte versus formula/breast milk). There was a significant difference in median hospital length of stay for early versus late initiation of feeds (POD 0: 2.1 days versus POD ≥1: 3.1 days, P < .01) without a difference in postoperative complications.CONCLUSIONThere is substantial variation in the postoperative feeding regimen after laparoscopic gastrostomy. Initiation of early postoperative feeds may result in decreased length of stay without increasing complications.

5. Surgical Feeding Tubes in Pediatric and Adolescent Cancer Patients: A Single-institution Retrospective Review.

Author(s): Hamilton, Emma C; Curtin, Thomas; Slack, Rebecca S; Ge, Christine; Slade, Austen D; Hayes-Jordan, Andrea; Lally, Kevin P; Austin, Mary T

Source: Journal of pediatric hematology/oncology; Oct 2017; vol. 39 (no. 7); p. e342

Publication Date: Oct 2017

Publication Type(s): Journal Article

PubMedID: 28678086

Abstract: The purpose of our study was to evaluate surgical enteric access in pediatric cancer patients to determine factors associated with postoperative complications. We performed a single-institution retrospective review of all patients below 21 years old with a primary cancer diagnosis who underwent surgical procedures for enteral access between 2004 and 2014. Multivariate logistic regression was performed to determine independent predictors of postoperative complications. During the study period, 122 patients had surgically placed feeding tubes, of whom 58% developed ≥1 complication(s) and 16% experienced a major complication. No single factor was significantly associated with developing any complication or major complication. Several trends were noted including increased complications associated with jejunostomy tubes, percutaneous endoscopic gastrostomy tubes, and abdominal radiation. Surgically placed enteric access in pediatric and adolescent cancer patients is associated with an extremely high complication rate emphasizing the importance of careful evaluation of these patients before embarking on surgical feeding access. Future work should evaluate mechanisms to decrease complications and/or explore alternative methods to provide supplemental nutrition in children and adolescents with cancer.

6. Systematic review with meta-analysis: enteral nutrition therapy for the induction of remission in paediatric Crohn's disease.

Author(s): Swaminath, A; Feathers, A; Ananthakrishnan, A N; Falzon, L; Li Ferry, S

Source: Alimentary pharmacology & therapeutics; Oct 2017; vol. 46 (no. 7); p. 645-656

Publication Date: Oct 2017

Publication Type(s): Journal Article Review

PubMedID: 28815649

Abstract:BACKGROUNDDespite potential adverse-events in a paediatric population, corticosteroids are used to induce remission in paediatric Crohn's disease. Exclusive enteral nutrition also induces remission, but is infrequently used in the USA because corticosteroids are considered the superior therapy. New data have become available since the publication of the most recent meta-analysis in 2007.AIMTo see if current literature supports the use of EEN versus CS in paediatric populations.METHODSAll studies with comparator arms of exclusive enteral nutrition and an exclusive corticosteroids, with remission clearly defined were identified by searching eight online databases.RESULTSOf 2795 identified sources, nine studies met our inclusion criteria. Eight of these (n = 451), had data that could be abstracted into our meta-analysis. Exclusive enteral nutrition was as effective as corticosteroids in inducing remission (OR = 1.26 [95% CI 0.77, 2.05]) in paediatric

Crohn's disease. There was no difference between Exclusive enteral nutrition and corticosteroids efficacy when comparing newly diagnosed Crohn's (OR = 1.61 [95% CI .87, 2.98]) or relapsed (OR = 0.76 [95% CI .29-1.98]). Intestinal healing was significantly more likely among patients receiving Exclusive enteral nutrition compared to corticosteroids (OR = 4.5 [95% CI 1.64, 12.32]). There was no difference in the frequency of biomarker normalisation including CRP (OR = 0.85 [95% CI .44, 1.67]) and faecal calprotectin (OR 2.79 [95% CI .79-10.90]).CONCLUSIONSThere is no difference in efficacy between exclusive enteral nutrition and corticosteroids in induction of remission in Crohn's disease in a paediatric population. Exploratory analyses suggest that a greater proportion of patients treated with exclusive enteral nutrition achieved mucosal healing.

7. Impact of the structure and dose of protein intake on clinical and metabolic outcomes in critically ill children: A systematic review.

Author(s): Hauschild, Daniela B; Ventura, Julia C; Mehta, Nilesh M; Moreno, Yara M F

Source: Nutrition (Burbank, Los Angeles County, Calif.); Sep 2017; vol. 41 ; p. 97-106

Publication Date: Sep 2017

Publication Type(s): Journal Article Review

PubMedID: 28760436

Abstract:OBJECTIVEThe aim of this study was to describe the effects of structure/type and total amount of protein intake on protein balance and clinical outcomes in critically ill children.METHODSWe conducted a systematic review of relevant literature on Embase, PubMed/Medline, Web of Science, Scopus, and Latin American and Caribbean Health Sciences. A partial gray literature search was undertaken and the reference lists of the selected articles were searched manually. Observational and clinical trials that evaluated the total protein intake, structure of the protein source, or both, in critically ill children were included. Nitrogen balance and clinical outcomes (mortality, length of stay, and duration of mechanical ventilation) were the main outcomes of interest.RESULTSWe found 18 eligible studies, of which 17 assessed the quantity and one described protein structure in relation to the outcomes. In all, 2118 pediatric critically ill patients 1.1 g/kg, especially >1.5 g/kg, was associated with positive protein balance and lower mortality.CONCLUSIONIn critically ill children, total daily protein intake >1.1 g/kg was associated with positive effects on clinical outcomes and protein balance. The existing data are not sufficient for determining the optimal structure of protein delivered by enteral route in critically ill children.

8. Nutrition Practices and Predictors of Postnatal Growth in Preterm Infants During Hospitalization: A Longitudinal Study.

Author(s): McKenzie, Briar L; Edmonds, Liza; Thomson, Ruth; Haszard, Jillian J; Houghton, Lisa A

Source: Journal of pediatric gastroenterology and nutrition; Sep 2017

Publication Date: Sep 2017

Publication Type(s): Journal Article

PubMedID: 28953525

Abstract: Premature infants are at high risk of undernutrition and extrauterine growth restriction (EUGR).AIMTo evaluate the relation between nutrition practices and growth rate in preterm infants from birth to 36 weeks postmenstrual age (PMA).METHODSLongitudinal data were collected retrospectively in 103 infants born <33-weeks gestation admitted to Dunedin NICU, New Zealand. Weight, length and head circumference at birth and 36-weeks PMA z-scores were calculated using the INTERGROWTH Preterm Growth Standard. Growth velocity (GV; g/kg/day) was determined via exponential model. Time to regain birth weight and nutritional practices including enteral nutrition,

withholding feeds, nutrient intake and feeding at discharge were described. Regression was used to explore associations between growth and nutritional variables.RESULTSGrowth faltering (weight-for-age z-score<-1.28/10 centile) increased from 9% at birth to 19% at 36-weeks PMA. Mean (SD) GV in-hospital [14.2 (3.3) g/kg/d] was well below the desirable rate of 18 g/kg/d. Forty-one percent of infants had feeds withheld, which was significantly associated with a longer time period to achieve full enteral feedings (P<0.001) and poorer weight and length z-score at 36 weeks PMA (both P < 0.05). The day of life to establish full enteral feedings was longer than recommended yet positively associated with weight at 36 weeks PMA (P = 0.019), while controlling for withholding feeds and other known confounders.CONCLUSIONEUGR was highly prevalent in this population. The negative association of withholding of feeds on growth reinforces the need to evaluate early life feeding protocols and further assess the longer term influence of this practice on post-discharge growth outcomes.

9. Assessing Selenium, Manganese, and Iodine Status in Pediatric Patients Receiving Parenteral Nutrition.

Author(s): Johnsen, Jacob Clarke; Reese, Susan Anne; Mackay, Mark; Anderson, Collin R; Jackson, Daniel; Paul, Irasema Libertad

Source: Nutrition in clinical practice : official publication of the American Society for Parenteral and Enteral Nutrition; Aug 2017; vol. 32 (no. 4); p. 552-556

Publication Date: Aug 2017

Publication Type(s): Journal Article

PubMedID: 28760114

Abstract:BACKGROUNDPediatric patients who are receiving parenteral nutrition (PN) unsupplemented with trace minerals can become deficient. Due to shortages in trace mineral products and the 2004 American Society for Parenteral and Enteral Nutrition report stating that individualized trace element supplementation may be warranted, a review was conducted concerning the trace minerals selenium (Se), manganese (Mn), and iodine (I).METHODA retrospective review of pediatric patients receiving PN that contained Se and Mn was conducted to determine if a difference existed between them and patients receiving PN without Se and Mn. Statistical analysis was done to assess a difference between trace mineral levels and the time to deficiency between supplemented and unsupplemented patients. Unsupplemented I patients had urine I levels assessed to determine deficiencies in patients receiving PN.RESULTSPlasma Se levels were measured at a mean of 20 days for supplemented patients (n = 131) and 19 days for nonsupplemented patients (n = 57) with no difference between groups (P = .2973). Plasma Mn levels were measured at a mean of 28 days, showing no statistical difference (P = .721). Of the 177 nonsupplemented I patients, 74% demonstrated I deficiencies without supplementation.CONCLUSIONSTime to the development of a Se, Mn, or I deficiency is important to guide supplementation of exclusive PN in children when trace mineral products are short in supply. Our retrospective experience supports assessment of the trace minerals Se at 21 days and Mn at 30 days. It also suggests that some pediatric patients receiving PN are deficient in I.

10. Early Life Protein Intake: Food Sources, Correlates, and Tracking across the First 5 Years of Life.

Author(s): Campbell, Karen J; Abbott, Gavin; Zheng, Miaobing; McNaughton, Sarah A

Source: Journal of the Academy of Nutrition and Dietetics; Aug 2017; vol. 117 (no. 8); p. 1188

Publication Date: Aug 2017

Publication Type(s): Journal Article

PubMedID: 28527745

Abstract:BACKGROUNDHigh consumption of protein has been associated with accelerated growth and adiposity in early childhood.OBJECTIVETo describe intake, food sources, correlates, and tracking of protein in young children.DESIGNSecondary analysis of Melbourne Infant Feeding Activity and Nutrition Trial (InFANT). Dietary data were collected using three 24-hour dietary recalls at ages 9 and 18 months as well as 3.5 and 5 years.PARTICIPANTS/SETTINGFirst-time mothers and their child (n=542) participated in an 18-month intervention to prevent childhood obesity and the cohort was followed-up with no intervention when children were aged 3.5 and 5 years.MAIN OUTCOME MEASURESProtein intake, food sources, correlates, and tracking of protein.STATISTICAL ANALYSES PERFORMEDChild and maternal correlates of protein intake were identified using linear regression and tracking of protein intake was examined using Pearson correlations of residualized protein scores between time points.RESULTSMean protein (grams per day) intake was 29.7±11.0, 46.3±11.5, 54.2±13.8, and 60.0±14.8 at 9 and 18 months and 3.5 and 5 years, respectively. Protein intakes at all ages were two to three times greater than age-appropriate Australian recommendations. The primary source of protein at 9 months was breast/formula milk. At later ages, the principal sources were milk/milk products, breads/cereals, and meat/meat products. Earlier breastfeeding cessation, earlier introduction of solids, high dairy milk consumption (≥500 mL), and high maternal education were significant predictors of high protein intake at various times ($P<0.05$). Slight tracking was found for protein intakes at 9 months, 18 months, and 5 years ($r=0.16$ to 0.21; $P<0.01$).CONCLUSIONSThis study provides unique insights into food sources and correlates of young children's high protein intakes, and confirms that early protein intakes track slightly up to age 5 years. These finding have potential to inform nutrition interventions and strategies to address high protein intakes and protein-related obesity risk.

11. European Society for Paediatric Gastroenterology, Hepatology and Nutrition Guidelines for the Evaluation and Treatment of Gastrointestinal and Nutritional Complications in Children With Neurological Impairment.

Author(s): Romano, Claudio; van Wynckel, Myriam; Hulst, Jessie; Broekaert, Ilse; Bronsky, Jiri; Dall'Oglio, Luigi; Mis, Nataša F; Hojsak, Iva; Orel, Rok; Papadopoulou, Alexandra; Schaeppi, Michela; Thapar, Nikhil; Wilschanski, Michael; Sullivan, Peter; Gottrand, Frédéric

Source: Journal of pediatric gastroenterology and nutrition; Aug 2017; vol. 65 (no. 2); p. 242-264

Publication Date: Aug 2017

Publication Type(s): Journal Article

PubMedID: 28737572

Abstract:OBJECTIVESFeeding difficulties are frequent in children with neurological impairments and can be associated with undernutrition, growth failure, micronutrients deficiencies, osteopenia, and nutritional comorbidities. Gastrointestinal problems including gastroesophageal reflux disease, constipation, and dysphagia are also frequent in this population and affect quality of life and nutritional status. There is currently a lack of a systematic approach to the care of these patients. With this report, European Society of Gastroenterology, Hepatology and Nutrition aims to develop uniform guidelines for the management of the gastroenterological and nutritional problems in children with neurological impairment.METHODSThirty-one clinical questions addressing the diagnosis, treatment, and prognosis of common gastrointestinal and nutritional problems in neurological impaired children were formulated. Questions aimed to assess the nutritional management including nutritional status, identifying undernutrition, monitoring nutritional status, and defining nutritional requirements; to classify gastrointestinal issues including oropharyngeal dysfunctions, motor and sensory function, gastroesophageal reflux disease, and constipation; to evaluate the indications for nutritional rehabilitation including enteral feeding and percutaneous

gastrostomy/jejunostomy; to define indications for surgical interventions (eg, Nissen Fundoplication, esophagogastric disconnection); and finally to consider ethical issues related to digestive and nutritional problems in the severely neurologically impaired children. A systematic literature search was performed from 1980 to October 2015 using MEDLINE. The approach of the Grading of Recommendations Assessment, Development, and Evaluation was applied to evaluate the outcomes. During 2 consensus meetings, all recommendations were discussed and finalized. The group members voted on each recommendation using the nominal voting technique. Expert opinion was applied to support the recommendations where no randomized controlled trials were available.

12. Growth and morbidity of extremely preterm infants after early full enteral nutrition.

Author(s): Maas, Christoph; Franz, Axel R; Krogh, Stefanie von; Arand, Jörg; Poets, Christian F

Source: Archives of disease in childhood. Fetal and neonatal edition; Jul 2017

Publication Date: Jul 2017

Publication Type(s): Journal Article

PubMedID: 28733478

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

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

Abstract:OBJECTIVESTo evaluate feasibility and consequences of accelerated feeding advancement on short-term outcomes in extremely low gestational age neonates (ELGANs) who stayed in our institution for >28 days.METHODSRetrospective single-centre cohort analysis covering the years 2011-2013. Data are presented as median (IQR).RESULTSInfants '(n=77) birth weight was 745 (640 to 960) g and gestational age at birth 26.7 (25.1 to 27.4) weeks. Full enteral feeds were attained by postnatal day 7 (5 to 11). Weight gain from birth to discharge was 14.3 (13.3 to 16.1) g/kg/day, change in SD score for weight -0.03 (-0.55 to 0.46) and 0.09 (-0.78 and 0.82) for head circumference. Rates of necrotising enterocolitis and spontaneous intestinal perforation in all ELGANs admitted during the study period were 3.1% and 9.4%, respectively.CONCLUSIONSThis cohort of ELGANs showed good weight gain and head growth after early full enteral nutrition. The impact of this feeding practice on neonatal morbidity and long-term outcome remains to be tested in adequately powered randomised trials.

13. Improving the quality of nutrition in pediatric trauma.

Author(s): Wang, Alice; Pelletier, Helena; Calligan, Diana; Coates, Angela; Allison Bailey, Karen

Source: International journal of health care quality assurance; Jul 2017; vol. 30 (no. 6); p. 539-544

Publication Date: Jul 2017

Publication Type(s): Journal Article

PubMedID: 28714831

Abstract: Purpose Nutrition plays a key role in the recovery of pediatric trauma patients. A catabolic state in trauma patients may hinder recovery and inadequate nutrition may increase morbidity, mortality and length of hospital stay. The purpose of this paper is to review the current nutrition support practices for pediatric trauma patients at McMaster Children's Hospital (MCH), describe patient demographics and identify areas to improve the quality of patient care. Design/methodology/approach A retrospective chart review was conducted on pediatric trauma patients (age<18 years) identified through the trauma registry of MCH. Pediatric trauma patients admitted from January 2010 to March 2014 with an Injury Severity Score (ISS)=12 and a hospitalization of =24 hours were included. Findings In total, 130 patients were included in this

study, 61.1 percent male, median age ten years (range: 0-17 years) and median ISS of 17 (range: 12-50). Blunt trauma accounted for 97.7 percent of patients admitted and 73.3 percent had trauma team activation. In total, 93 patients (71.5 percent) had ICU stays. The median time to feed was 29 hours (interquartile range: 12.5-43 hours) from the time of admission. An increased hospital length of stay was associated with longer time to initiation of nutrition support, a higher ISS and greater number of surgeries (p<0.05). Originality/value Local nutritional support practices for pediatric trauma patients correspond with recommended principles of early feeding and preferential enteral nutrition. Harmonization of paper-based and electronic data collection is recommended to ensure that prescribed nutritional support is being delivered and nutritional needs of pediatric trauma patients are being met.

14. Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Pediatric Critically Ill Patient: Society of Critical Care Medicine and American Society for Parenteral and Enteral Nutrition.

Author(s): Mehta, Nilesh M; Skillman, Heather E; Irving, Sharon Y; Coss-Bu, Jorge A; Vermilyea, Sarah; Farrington, Elizabeth Anne; McKeever, Liam; Hall, Amber M; Goday, Praveen S; Braunschweig, Carol

Source: Pediatric critical care medicine : a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies; Jul 2017; vol. 18 (no. 7); p. 675-715

Publication Date: Jul 2017

Publication Type(s): Journal Article

PubMedID: 28691958

Abstract: This document represents the first collaboration between two organizations, American Society of Parenteral and Enteral Nutrition and the Society of Critical Care Medicine, to describe best practices in nutrition therapy in critically ill children. The target of these guidelines is intended to be the pediatric (> 1 mo and < 18 yr) critically ill patient expected to require a length of stay greater than 2 or 3 days in a PICU admitting medical, surgical, and cardiac patients. In total, 2,032 citations were scanned for relevance. The PubMed/Medline search resulted in 960 citations for clinical trials and 925 citations for cohort studies. The EMBASE search for clinical trials culled 1,661 citations. In total, the search for clinical trials yielded 1,107 citations, whereas the cohort search yielded 925. After careful review, 16 randomized controlled trials and 37 cohort studies appeared to answer one of the eight preidentified question groups for this guideline. We used the Grading of Recommendations, Assessment, Development and Evaluation criteria to adjust the evidence grade based on assessment of the quality of study design and execution. These guidelines are not intended for neonates or adult patients. The guidelines reiterate the importance of nutritional assessment, particularly the detection of malnourished patients who are most vulnerable and therefore potentially may benefit from timely intervention. There is a need for renewed focus on accurate estimation of energy needs and attention to optimizing protein intake. Indirect calorimetry, where feasible, and cautious use of estimating equations and increased surveillance for unintended caloric underfeeding and overfeeding are recommended. Optimal protein intake and its correlation with clinical outcomes are areas of great interest. The optimal route and timing of nutrient delivery is an area of intense debate and investigations. Enteral nutrition remains the preferred route for nutrient delivery. Several strategies to optimize enteral nutrition during critical illness have emerged. The role of supplemental parenteral nutrition has been highlighted, and a delayed approach appears to be beneficial. Immunonutrition cannot be currently recommended. Overall, the pediatric critical care population is heterogeneous, and a nuanced approach to individualizing nutrition support with the aim of improving clinical outcomes is necessary.

16. Effect of early supplemental parenteral nutrition in the paediatric ICU: a preplanned observational study of post-randomisation treatments in the PEPaNIC trial.

Author(s): Vanhorebeek, Ilse; Verbruggen, Sascha; Casaer, Michaël P; Gunst, Jan; Wouters, Pieter J; Hanot, Jan; Guerra, Gonzalo Garcia; Vlasselaers, Dirk; Joosten, Koen; Van den Berghe, Greet

Source: The Lancet. Respiratory medicine; Jun 2017; vol. 5 (no. 6); p. 475-483

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28522351

Abstract:BACKGROUNDLarge randomised controlled trials have shown that early supplemental parenteral nutrition in patients admitted to adult and paediatric intensive care units (PICUs) is harmful. Overdosing of energy with too little protein was suggested as a potential reason for this. This study analysed which macronutrient was associated with harm caused by early supplemental parenteral nutrition in the Paediatric Early versus Late Parenteral Nutrition In Critical Illness (PEPaNIC) randomised trial.METHODSPatients in the initial randomised controlled trial were randomly assigned to receive suppplemental parenteral nutrition (PN) within 24 h of PICU admission (early PN) or to receive such PN after 1 week (late PN) when enteral nutrition was insufficient. In this post-randomisation, observational study, doses of glucose, lipids, and aminoacids administered during the first 7 days of PICU stay were expressed as % of reference doses from published clinical guidelines for age and weight. Independent associations between average macronutrient doses up to each of the first 7 days and likelihood of acquiring an infection in the PICU, of earlier live weaning from mechanical ventilation, and of earlier live PICU discharge were investigated using multivariable Cox proportional hazard analyses. The three macronutrients were included in the analysis simultaneously and baseline risk factors were adjusted for.FINDINGSFrom June 18, 2012, to July 27, 2015, 7519 children aged between newborn and 17 years were assessed for eligibility. 6079 patients were excluded, and 1440 children were randomly assigned to receive either early PN (n=723) or late PN (n=717). With increasing doses of aminoacids, the likelihood of acquiring a new infection was higher (adjusted hazard ratios [HRs] per 10% increase between 1·043-1·134 for days 1-5, p≤0·029), while the likelihood of earlier live weaning from mechanical ventilation was lower (HRs 0·950-0·975 days 3-7, p≤0·045), and the likelihood of earlier live PICU discharge was lower (HRs 0·943-0·972 days 1-7, p≤0·030). By contrast, more glucose during the first 3 days of PICU stay was independently associated with fewer infections (HRs 0·870-0·913, p≤0·036), whereas more lipids was independently associated with earlier PICU discharge (HRs 1·027-1·050, p≤0·043 days 4-7). Risk of harm with aminoacids was also shown for low doses.INTERPRETATIONThese associations suggest that early administration of aminoacids, but not glucose or lipids, could explain harm caused by early supplemental parenteral nutrition in critically ill children.FUNDINGFlemish Agency for Innovation through Science and Technology; UZLeuven Clinical Research Fund; Research Foundation Flanders; Methusalem Programme Flemish Government; European Research Council; Fonds-NutsOhra; Erasmus-MC Research Grant; Erasmus Trustfonds.

Database: Medline

17. Development, prevention, and treatment of feeding tube dependency.

Author(s): Krom, Hilde; de Winter, J Peter; Kindermann, Angelika

Source: European journal of pediatrics; Jun 2017; vol. 176 (no. 6); p. 683-688

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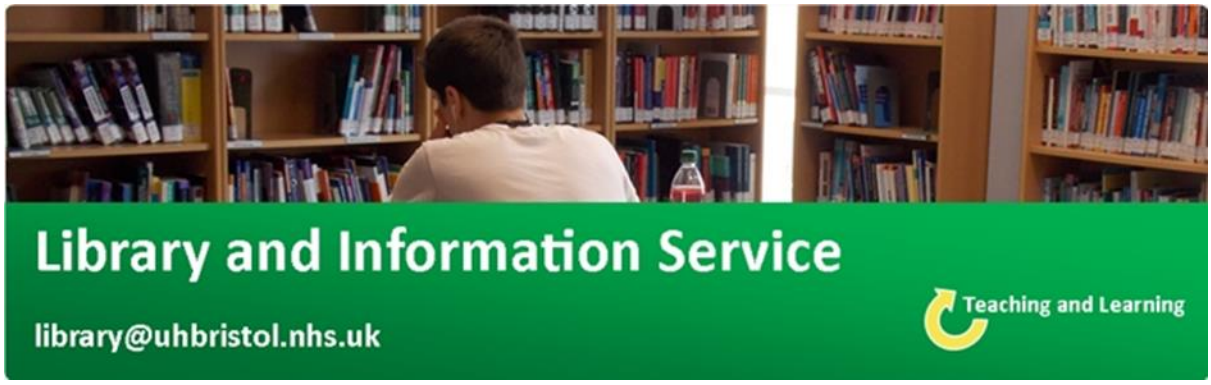
Abstract: Enteral nutrition is effective in ensuring nutritional requirements and growth. However, when tube feeding lasts for a longer period, it can lead to tube dependency in the absence of medical reasons for continuation of tube feeding. Tube-dependent children are unable or refuse to start oral activities and they lack oral skills. Tube dependency has health-, psychosocial-, and economy-related consequences. Therefore, the transition to oral feeding is of great importance. However, this transition can be very difficult and needs a multidisciplinary approach. Most studies for treatment of tube dependency are based on behavioral interventions, such as family therapy, individual behavior therapy, neuro-linguistic programming, and parental anxiety reduction. Furthermore, oral motor therapy and nutritional adjustments can be helpful in tube weaning. The use of medication has been described in the literature. Although mostly chosen as the last resort, hunger-inducing methods, such as the Graz-model and the Dutch clinical hunger provocation program, are also successful in weaning children off tube feeding.CONCLUSIONThe transition from tube to oral feeding is important in tube-dependent children but can be difficult. We present an overview for the prevention and treatment of tube dependency. What is known: • Longer periods of tube feeding can lead to tube dependency. • Tube weaning can be very difficult. What is new: • Weaning as soon as possible and therefore referral to a multidisciplinary team are recommended. • An overview of treatment options for tube dependency is presented in this article.



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