Staff Publications 2012

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Nasopharyngeal carriage of Streptococcus pneumoniae: prevalence and risk factors in HIV-positive children in Tanzania.


SummaryBackground Pneumococcal colonization of the nasopharynx is especially common in young children and is a pre-requisite for pneumococcal disease. Those with immunosuppression, such as HIV, are at higher risk of colonization and disease, especially at older ages. Currently, vaccination schedules are only offered to children under 6 months of age, despite the large impact of pneumococcal disease in older unvaccinated children with HIV. We conducted a study to assess the prevalence of, and risk factors for, pneumococcal carriage in HIV-positive children aged &lt;15 years. Methods We collected a single nasopharyngeal swab from 142 HIV-infected children aged 1–14 years over a 2-month period. To detect carriage of pneumococcus, these samples were cultured and serotyped; PCR was performed on negative samples. We also collected epidemiological data via survey and medical records. Results The overall carriage rate was 81% and was at least 76% in those aged 5–14 years. The 7-, 10-, and 13-valent pneumococcal vaccines would cover 37%, 37%, and 49% of children with carriage, respectively. In the multivariate analysis, we identified increase in weight since last visit (p = 0.028) and the existence of care-givers who had respiratory symptoms in the past week (p = 0.022) as risk factors for carriage. Weight gain was also significantly associated with antiretroviral use (p = 0.002). Conclusions These data illuminate the little known area of pneumococcal carriage in older HIV-infected children as well as finding novel risk factors for pneumococcal carriage, namely the association with household members who have respiratory symptoms and with an increase in the child’s weight prior to swabbing. Weight gain may be due to an increase in health enabling more mobility and increasing the risk of acquiring carriage. The carriage rate observed (81%) is one of the highest recorded. Further research should address whether vaccination can prevent the acquisition of carriage and so protect against disease.

Banfield S, Pascoe E, Thambiran A, Siafarikas A and Burgner D

Factors associated with the performance of a blood-based interferon-gamma release assay in diagnosing tuberculosis.


BACKGROUND: Indeterminate results are a recognised limitation of interferon-gamma release assays (IGRA) in the diagnosis of latent tuberculosis (TB) infection (LTBI) and TB disease, especially in children. We investigated whether age and common co-morbidities were associated with IGRA performance in an unselected cohort of resettled refugees. METHODS: A retrospective cross-sectional study of refugees presenting for their post-resettlement health assessment during 2006 and 2007. Refugees were investigated for prevalent infectious diseases, including TB, and for common nutritional deficiencies and haematological abnormalities as part of standard clinical screening protocols. Tuberculosis screening was performed by IGRA; QuantiFERON-TB Gold in 2006 and QuantiFERON-TBGold In-Tube in 2007. RESULTS: Complete data were available on 1130 refugees, of whom 573 (51%) were children less than 17 years and 1041 (92%) were from sub-Saharan Africa. All individuals were HIV negative. A definitive IGRA result was obtained in 1004 (89%) refugees, 264 (26%) of which were positive; 256 (97%) had LTBI and 8 (3%) had TB disease. An indeterminate IGRA result was obtained in 126 (11%) refugees (all failed positive mitogen control). In multivariate analysis, younger age (linear OR= 0.93 [95% CI 0.91-0.95], P<0.001), iron deficiency anaemia (2.69 [1.51-4.80], P = 0.001), malaria infection (3.04 [1.51-6.09], P = 0.002), and helminth infection (2.26 [1.48-3.46], P<0.001), but not vitamin D deficiency or insufficiency, were associated with an indeterminate IGRA result. CONCLUSIONS: Younger age and a number of common co-morbidities are significantly and independently associated with indeterminate IGRA results in resettled predominantly African refugees.
Bauer S, Dunne B and Whitewood C. Simultaneous bilateral elbow dislocation with bilateral medial epicondyle fractures in a 13-year-old female gymnast with hyperlaxity. BMJ Case Rep. 2012; 2012. Bilateral simultaneous elbow dislocations are extremely rare and have only been described in 12 cases. In the paediatric population unilateral elbow dislocations are rare with 3-6% of all elbow injuries and there are only few studies describing this injury exclusively in children. There is only one case report of a paediatric patient who sustained a simultaneous bilateral elbow dislocation with medial epicondyle fractures. We present a second paediatric case of simultaneous bilateral elbow dislocation with associated displaced bilateral medial epicondyle fractures in a gymnast with joint hyperlaxity (3 of 5 Wynne-Davies criteria) treated with closed reduction and short-term immobilisation (3 weeks). The patient returned to full trampoline gymnastics between 4 and 5 months postinjury and made an uneventful recovery.

Baynam G, Walters M, Claes P and Le Souef P. 3D facial analysis can investigate vaccine responses. Medical Hypotheses. 2012; 78(4): 497-501. We propose that, given shared evolutionarily factors mediate vaccine response and facial development, objective, high-resolution 3D facial analysis can be employed to investigate phenomena underlying vaccine response/failure. To account for ontological processes, the optimal prospective cohort would be ascertained in early life and followed longitudinally. Additionally, the non-invasive and relatively inexpensive nature of these technologies is ideally suited for novel investigations of existing cohorts and for use in developing countries.

Bell L, Davis E, Knuiman M, Divitini M, Beilby J, Hunter M and Hung J. Lipids in Australian children: Cause for concern? 2005-2007 Busselton Health Study. Journal of paediatrics and child health. 2012; 48(10): E172-177. Aim: To report the current lipid status of Australian school children from a population-based sample and compare this to international and Australian data. Methods: A cross section of school children aged 6 to 16.9 years in Busselton, Western Australia (WA) between 2005 and 2007 had fasting lipids tested. The first analysis compares the Busselton sample to data recommended by the American Academy of Paediatrics (AAP) 2008. The second analysis compares the Busselton sample to data from the Schools Physical Activity and Nutrition Survey (SPANS) study, New South Wales (NSW), Australia, 2004 and the 1985 Australian Health and Fitness Survey (AHFS). The third analysis applies laboratory-reported cut-points in WA to report percentages over 'healthy desirable norms'. Results: Analysis 1: higher levels of total cholesterol and triglycerides in Busselton children compared to AAP data source. Boys had higher low-density lipoprotein (LDL) levels. Analysis 2: comparable rates of dyslipidaemia to SPANS 2004 but lower rates compared to the AHFS, 1985. Analysis 3: total and LDL-cholesterol above recommended range in 32.7% and 19.4% of boys and 38.2% and 24.6% of girls. Conclusion: In a large population-based sample of Australian school children, we found a higher frequency of abnormal lipid profiles when compared to American data. In addition, many children have levels outside reported healthy norms for Australian children. Research tracking lipid profiles of Australian children into adulthood is needed to understand the association of these levels with future cardiovascular risk.

Blyth CC, Barzi F, Hale K and Isaacs D. Chemoprophylaxis of neonatal fungal infections in very low birthweight infants: efficacy and safety of fluconazole and nystatin. Journal of paediatrics and child health. 2012; 48(9): 846-851. Aim: To review the use of antifungal chemoprophylaxis to prevent neonatal invasive fungal infections (IFI) in very low birthweight infants (VLBW <1500 g). Method: Systematic review of randomised controlled trials. Results: Nine trials were identified (2029 infants), with six comparing fluconazole with placebo/no treatment (840 infants), three comparing nystatin with placebo/no treatment (1200 infants) and two comparing fluconazole and nystatin (257 infants). Prophylactic fluconazole reduced the incidence of IFI in VLBW infants <1500 g to 5.1% compared with 16.0% in infants receiving placebo, relative risk (RR) = 0.36 (95% confidence interval 0.15-0.89). The mortality was 10.9% and 16.7%, respectively (RR 0.76, 0.54-1.08). Oral nystatin reduced the incidence of IFI in VLBW infants to 5.3% compared with 28.0% in infants receiving placebo (RR 0.16, 0.11-0.23). Mortality was 7.5% with nystatin and 10.9% with placebo (RR 0.86, 0.59-1.26). The incidence of IFI in studies comparing fluconazole and nystatin was 3.6% and 8.0%, respectively (RR 0.54, 0.19-1.56), and mortality was not significantly different: 4.6% versus 9.8% (RR 0.43, 0-4.31) Conclusions: Prophylactic fluconazole and oral nystatin are both highly effective in preventing IFI in VLBW infants. Both agents are safe without significant toxicities. Antifungal prophylaxis should therefore be used in all VLBW infants. Given the paucity of data comparing fluconazole with nystatin, the choice of antifungal agent should be influenced by the incidence of IFI, local epidemiology and relative cost.
Blyth CC, Webb SAR, Kok J, Dwyer DE, van Hal SJ, Foo H, Ginn AN, Kesson AM, Seppelt I, Iredell JR, on behalf of the AII and Investigators CM. The impact of bacterial and viral co-infection in severe influenza. Influenza and other respiratory viruses. 2012. Background Many questions remain concerning the burden, risk factors and impact of bacterial and viral co-infection in patients with pandemic influenza admitted to the intensive care unit (ICU). Objectives To examine the burden, risk factors and impact of bacterial and viral co-infection in Australian patients with severe influenza. Patients/Methods A cohort study conducted in 14 ICUs was performed. Patients with proven influenza A during the 2009 influenza season were eligible for inclusion. Demographics, risk factors, clinical data, microbiological data, complications and outcomes were collected. Polymerase chain reaction for additional bacterial and viral respiratory pathogens was performed on stored respiratory samples. Results Co-infection was identified in 23.3–26.9% of patients with severe influenza A infection: viral co-infection, 3.2–3.4% and bacterial co-infection, 20.5–24.7%. Staphylococcus aureus was the most frequent bacterial co-infection followed by Streptococcus pneumoniae and Haemophilus influenzae. Patients with co-infection were younger [mean difference in age = 8.46 years (95% CI: 0.18–16.74 years)], less likely to have significant co-morbidities (32.0% versus 66.2%, P = 0.004) and less frequently obese [mean difference in body mass index = 6.96 (95% CI: 1.77–11.96)] compared to those without co-infection. Conclusions Bacterial or viral co-infection complicated one in four patients admitted to ICU with severe influenza A infection. Despite the co-infected patients being younger and with fewer co-morbidities, no significant difference in outcomes was observed. It is likely that co-infection contributed to a need for ICU admission in those without other risk factors for severe influenza disease. Empiric antibiotics with staphylococcal activity should be strongly considered in all patients with severe influenza A infection.

Booy R, Richmond P, Nolan T, McVernon J, Marshall H, Nissen M, Reynolds G, 2nd, Ziegler JB, Stoney T, Heron L, Lambert S, Mesaros N, Peddiraju K and Miller JM. Three-Year Antibody Persistence and Safety following a Single Dose of Combined Haemophilus influenzae Type b-Neisseria meningitidis Serogroup C-Tetanus Toxoid Conjugate Vaccine in Hib-Primed Toddlers. The Pediatric infectious disease journal. 2012. BACKGROUND:: Persistence of seroprotective bactericidal antibody titers is important for long-term protection against meningococcal serogroup C disease in young children. Antibody persistence values were determined in children up to 3 years after vaccination with a single dose of the combined Haemophilus influenzae type b-Neisseria meningitidis serogroup C-tetanus toxoid conjugate vaccine (Hib-MenC-TT; www.ClinicalTrials.gov: NCT00326118). METHODS:: The children had been randomized at age 12 to 18 months to receive either 1 dose of Hib-MenC-TT (Hib-MenC group) or separately administered Hib-tetanus toxoid (Hib-TT) conjugate vaccine and MenC-CRM197 vaccine (Hib+MCC group). All children had been primed in infancy with a Hib vaccine. Antibodies against MenC were measured by a serum bactericidal assay using rabbit complement (rSBA-MenC) and antibodies against Hib polyribosylribitol phosphate (PRP) were assessed by enzyme-linked immunosorbent assay. RESULTS:: rSBA-MenC titers >/=1:8 were demonstrated 3 years post-vaccination in 64.2% and 53.2% of participants in the Hib-MenC group and Hib+MCC group, respectively. Anti-PRP concentrations >/=0.15 microg/mL persisted in more than 98% of participants in both groups. rSBA-MenC geometric mean titers and anti-PRP geometric mean concentrations remained higher 3 years post-vaccination than before vaccination. No serious adverse events assessed by the investigator as being related to vaccination were reported. CONCLUSION:: In this antibody persistence study of Hib-primed but MenC-naive toddlers who received a single dose of Hib-MenC-TT, protective antibody levels against Hib and MenC were maintained in the majority of children 3 years after vaccination.

Bradman K, Borland M and Pascoe E. Predicting patient disposition in a paediatric emergency department. Journal of paediatrics and child health. 2012. AIM: The aim of this study is to directly compare published prediction tools with triage nurse (TN) predictions within a defined paediatric population. METHOD: A prospective observational study carried out over a week in May 2010 in the Emergency Department (ED) at Princess Margaret Hospital for Children in Perth, Western Australia. TN predicted which patients would be admitted to hospital at the time of ED presentation. Data required for the other prediction tools (paediatric early warning score (PEWS); triage category and the Pediatric Risk of Admission Score (PRISA) and PRISA II were obtained from the notes following the patient's ED attendance. RESULTS: A total of 1223 patients presented during the study week, 91 patients were excluded and a total of 946 patients (83.6%) had TN predictions and were included in the analysis. TN predictions were compared against a PEWS >/= 4, triage category 1, 2 and 3, PRISA >/= 9 and PRISA II >/= 2. TNs had the highest prediction accuracy (87.7%), followed by an elevated PEWS (82.9%), triage category of 1, 2, or 3 (82.9%). The PRISA and PRISA II score had an accuracy of 80.1% and 79.7%, respectively. CONCLUSION:
When compared with validated prediction tools, the TN is the most accurate predictor of need to admit. This study provides valuable information in planning efficient flow of patients through the ED.

Characterization of 17.94, a novel anaplastic Wilms’ tumor cell line.
Cancer Genetics. 2012; 205(6): 319-326. Despite considerable advances in understanding the molecular pathogenesis of Wilms’ tumor (WT), its cell biology is less well understood, partly due to the paucity of established WT cell lines. We report here the establishment of a new anaplastic WT cell line, 17.94, which expressed NCAM, SALL1, and CITED1—phenotypic features expected of metanephric blastema-derived cells. Treatment of 17.94 cells with 12-O-Tetradecanoylphorbol 13-acetate caused morphological changes, which led to reduced NCAM and SALL1 expression, but expression of vimentin was maintained, indicating a potential for stromal differentiation. The 17.94 cell line contained a TPS3 mutation, consistent with the anaplastic histology of the original tumor, but lacked mutations in WT1, WTX, or CTNNB1, which are the other genes involved in WT pathogenesis. The 17.94 cells showed no loss of heterozygosity at 7p, 11p, or 16q; however, DNA hypermethylation was detected at several loci, including the H19 differentially methylated region (indicative of loss of imprinting of IGF2 at 11p15) and at the PCDH@ gene clusters at 5q31. The derivation of the 17.94 cell line should help to further dissect the genetic–epigenetic interactions involved in the pathogenesis of WT.

**Browning RM, Fellingham WH, O’Loughlin EJ, Brown NA and Paech MJ.**
Prophylactic Ondansetron Does Not Prevent Shivering or Decrease Shivering Severity During Cesarean Delivery Under Combined Spinal Epidural Anesthesia: A Randomized Trial.
Reg Anesth Pain Med. 2012. OBJECTIVES: Cesarean delivery is commonly performed under regional anesthesia, which is often associated with maternal shivering. This can cause distress and interfere with monitoring. The study objective was to evaluate the antishivering efficacy of ondansetron, which reduces the incidence and severity of shivering in nonobstetric patients. We hypothesized that there would be a significant decrease in the incidence and/or severity of shivering in women who are given intravenous ondansetron 8 mg before combined spinal epidural (CSE) anesthesia, when compared with placebo. METHODS: This was a randomized, double-blinded, parallel-group, placebo-controlled trial of 118 women scheduled for elective cesarean surgery. Women received either intravenous ondansetron 8 mg (n = 58) or saline (n = 60) before CSE anesthesia (intrathecal hyperbaric bupivacaine 0.5% 2.2-2.5 mL plus fentanyl 15 μg). The incidence and severity of shivering, measured on a validated 5-point scale, and other outcomes, such as nausea, pruritus, headache, or satisfaction, were assessed at 3 time points during the surgery and postoperative period. RESULTS: The incidence of shivering at any time point did not differ significantly between groups: ondansetron 41% versus placebo 47% (P = 0.54). The incidence of severe shivering at any time was not significantly different: ondansetron 32% versus placebo 33% (P = 0.79). There were no significant differences between the groups for any secondary outcomes. CONCLUSIONS: Intravenous ondansetron 8 mg before performing CSE anesthesia in women undergoing elective cesarean delivery does not decrease the incidence or severity of shivering.

**Buckland A, Jackson L, Ilich T, Lipscombe J, Jones G and Vijayasekaran S.**
Drilling speaking valves to promote phonation in tracheostomy-dependent children.
Laryngoscope. 2012; 122(10): 2316-2322. OBJECTIVES/HYPOTHESIS: Placement of a Passy-Muir speaking valve is considered best practice for infants and children with a tracheostomy. The Passy-Muir valve enables phonation by redirecting exhaled air via the glottis. Poor tolerance of the Passy-Muir valve is associated with excessive transtracheal pressures on exhalation due to upper airway obstruction. Drilling a small hole in the side of the Passy-Muir valve creates a pressure relief port to allow partial exhalation through the tracheostomy tube while enabling phonation. STUDY DESIGN: A retrospective case series is presented of 10 aphonie pediatric patients with a tracheostomy trialed with a drilled Passy-Muir valve. METHODS: Valve tolerance was assessed clinically and objectively. Handheld manometry was used to determine transtracheal pressures on passive exhalation. All patients had a diagnosis of upper airway obstruction and demonstrated excessive pressures wearing a standard Passy-Muir valve. Patients were assessed wearing a Passy-Muir valve with up to two 1.6-mm holes drilled in the side of the valve. Patients progressed to trials if clinically stable and if transtracheal pressure did not exceed 10 cm H(2) O when wearing the valve. RESULTS: Eight patients progressed to trial, with five of eight patients able to phonate within 1 week and six of eight able to tolerate wearing the valve for ≥ 2-hour periods within 2 weeks of introduction. All eight patients were able to phonate within 6 months of valve introduction. CONCLUSIONS: These findings support drilling Passy-Muir speaking valves as a promising option to facilitate phonation in pediatric patients with a tracheostomy for upper airway obstruction.

**Calder A, Bell GT, Andersson M, Thomson AH, Watson DG and Morton NS.**
Pharmacokinetic profiles of epidural bupivacaine and ropivacaine following single-shot and continuous epidural use in young infants.
AIMS: The primary aim of this study was to describe the pharmacokinetics of total and unbound bupivacaine and ropivacaine following epidural bolus and infusion in neonates and young infants. Secondary aims were to investigate the influence of alpha-1-acid glycoprotein (AAG) on the concentration-time profiles and to determine the efficacy and adverse event profile of the epidural regimen. METHODS/MATERIALS: Thirty-one infants aged 40-63 weeks of postmenstrual age (PMA) undergoing hernia repair or abdominal surgery received an epidural injection of 1.5 mg . kg(-1) bupivacaine (0.25%) or ropivacaine (0.2%) followed 2 h later by an infusion of 0.2 mg . kg(-1) . h(-1) in those undergoing abdominal surgery. Total and unbound concentrations of bupivacaine and ropivacaine were analyzed using nonmem. Hourly pain scores and adverse effects were recorded. RESULTS: Bupivacaine data were available from 11 infants (five had infusions) and ropivacaine from 13 infants (four had infusions). Alpha-1-acid glycoprotein and total bupivacaine and ropivacaine concentrations accumulated during infusions, but unbound concentrations did not. Maximum unbound concentrations for bupivacaine and ropivacaine were 0.12 mg . l(-1) (bupivacaine) and 0.13 mg . l(-1) (ropivacaine). Typical clearance/bioavailability estimates of total (unbound) bupivacaine were 0.215 (4.65) l . h(-1) . kg(-1) and of total (unbound) ropivacaine were 0.288 (3.31) l . h(-1) . kg(-1). Pain scores requiring pain team referral occurred once with bupivacaine and four times with ropivacaine. No toxicity was observed. CONCLUSIONS: Epidural infusions of 0.2 mg . kg(-1) . h(-1) bupivacaine or ropivacaine appeared to be well tolerated and efficacious in this population. No accumulation of unbound drug concentrations occurred.

Calder A, Hegarty M, Davies K and von Ungern-Sternberg BS.
The difficult airway trolley in pediatric anesthesia: an international survey of experience and training.
BACKGROUND: The pediatric difficult airway can be unexpected, leading to significant morbidity and mortality. Standardized emergency airway equipment should be available on a regularly checked difficult airway trolley (DAT). We conducted a survey to investigate pediatric anesthetists’ knowledge, experience, and confidence with the DAT. METHODS: Members of the Association of Paediatric Anaesthetists of Great Britain and Ireland (APAGBI), European Society for Paediatric Anaesthesiology (ESPA) and their national societies, Canadian Pediatric Anesthesia Society (CPAS), and Society for Paediatric Anaesthesia in New Zealand and Australia (SPANZA) were invited to complete a survey between January and April 2011. RESULTS: Six hundred and ninety-three anesthetists replied to the questionnaire. Six hundred and thirty-three (92%) stated they have a DAT in their theater suite, with 587 (98%) knowing its location. Three hundred and eight-seven (56%) anesthetists received formal DAT training. The lowest training levels were observed in Australia and the UK; 42% and 59%, respectively. Those receiving training were more likely to be confident/very confident in knowing the DAT contents (r = -0.321, P = 0.01). Three hundred and fifty-five (59%) anesthetists had used the DAT in the last 6 months, 82 (14%) in the last 6-12 months, 91 (15%) >1 year ago, and 72 (12%) had never used it. Frequency of use correlated moderately with higher confidence levels (r = -0.398, P = 0.01). One hundred and eight-three (31%) reported having experienced problems with DAT equipment (missing 20%, faulty 4%, unfamiliarity 7%). DISCUSSION: Training and recent use of the DAT increases anesthetists’ confidence, but is not a universal practice. A significant number of anesthetists reported problems with the DAT, raising issues of equipment maintenance and quality control.

Calder A, Hegarty M, Erb TO and von Ungern-Sternberg BS.
Predictors of postoperative sore throat in intubated children.
BACKGROUND: The incidence of postoperative sore throat (POST) following intubation is not well defined in the pediatric population. The etiology is multifactorial and includes impairment of subglottic mucosal perfusion and edema as a result of the pressures exerted by cuffed or uncuffed tubes. AIM: To determine the incidence of, and risk factors for, POST in intubated children undergoing elective day-case surgery. METHODS: Five hundred patients aged 3-16 years were studied prospectively. Endotracheal tube (ETT) choice (cuffed or uncuffed) was left to the anesthetist. The cuff was inflated either until loss of audible leak or to a determined pressure using a cuff manometer. The research team then measured the cuff pressure (CP). POST incidence and intensity was determined by interviewing patients prior to discharge from the same day procedure unit. Chi-square testing and stepwise logistic regression were used to determine the predictors of POST. RESULTS: Of the 111 (22%) children developed a sore throat, 19 (3.8%) a sore neck, and 5 (1%) a sore jaw. 19% of patients with cuffed ETTs complained of sore throat compared with 37% of those intubated with an uncuffed ETT. The incidence of POST increased with CP; 0-10% at 0 cmH(2)O, 4% at 11-20 cmH(2)O, 20% at 21-30 cmH(2)O, 68% at CP 31-40 cmH(2)O, and 96% at CP >40 cmH(2)O. The ETT CP and use of uncuffed ETTs were univariate predictors of POST. CONCLUSIONS: Children intubated with uncuffed ETTs are more likely to have
POST. ETT CP is positively correlated with the incidence of POST. When using cuffed ETTs, CP should be routinely measured intraoperatively.

Calley A, Williams S, Reid S, Blair E, Valentine J, Girdler S and Elliott C. A comparison of activity, participation and quality of life in children with and without spastic diplegia cerebral palsy. Disabil Rehabil. 2012; 34(15): 1306-1310. PURPOSE: To measure activity, participation and QoL in children with CP and to determine how these differ from a comparable group of typically developing (TD) children. METHOD: A total of eleven males and eight females with CP ranging in age from 5 to 12 years (mean age 7 years 10 months, SD 1 year 10 months; GMFCS level I-II) and 19 age and sex matched TD peers were recruited. Activity was measured using Paediatric Activity Card Sort (PACS), 6-Minute Walk Test and Timed Up and Go Test (TUG). Participation was measured using the assessment of Life Habits (LIFE-H) and quality of life was measured using the Cerebral Palsy Quality of Life Questionnaire (CP-QoL). RESULTS: TD children performed more activities of personal care than children with CP, as assessed via the PACS, t(40) = 3.266, p = 0.002. TD children participate in more life habits than children with CP across all the LIFE-H domains except that of relationships. Results from the CP-QoL indicate that TD children experience a greater QoL in the domains of functioning, t(40) = 2.824, p = 0.007, and participation and physical health, t(40) = 3.543, p = 0.001, than children with CP. Conclusions: These findings encourage the development of therapeutic interventions that aim to reduce these imbalances at all levels of the International Classification of Functioning, Disability and Health.


Chambers NA, Pascoe E, Kaplanian S and Forsyth I. Ingestion of stimulant medications does not alter bispectral index or clinical depth of anesthesia at 1 MAC sevoflurane in children. Paediatr Anaesth. 2012; 22(4): 341-344. BACKGROUND/AIM: Children treated with stimulant medications for the behavioral management of attention deficit hyperactivity disorder (ADHD) may present for elective surgery. Stimulant medication is often continued until the morning of surgery to optimize periooperative behavior. It is unknown whether such stimulant drug ingestion can affect cerebral arousal and alter depth of anesthesia. A clinically relevant alteration in measured depth of anesthesia could form the basis for an evidence-based recommendation that children taking stimulant medications require a change in the amount of anesthetic delivered or that they require routine monitoring of depth of anesthesia. MATERIALS AND METHODS: Thirty-four ASA 1 and 2 children aged between 5 and 16, presenting for elective day case surgery, were recruited. Seventeen had a diagnosis of ADHD and had taken stimulant medication on the day of surgery, and 17 were controls. A standard inhalational induction of anesthesia using air, oxygen, and sevoflurane by facemask was performed and maintained for 10 min at 1 MAC enfoidal sevoflurane. During this time, no other stimulus was applied to the patient. Bispectral index (BIS) and other markers of depth of anesthesia were recorded after 10 min. RESULTS: Children in both groups were of similar ages and weights. There were a higher percentage of boys in the stimulants group. Baseline physiological parameters were similar in both groups. After induction and equilibration for 10 min of anesthesia at 1 MAC enfoidal sevoflurane, there was no significant difference in BIS or clinical markers of depth of anesthesia. CONCLUSIONS: Children taking stimulant medication for ADHD, and who ingest medication on the day of surgery, do not appear to have altered BIS or depth of anesthesia at 1 MAC of sevoflurane. These results do not support a recommendation for a change in anesthetic practice for children having ingested stimulants up to the day of surgery, either in terms of increasing the amount of anesthetic given or monitoring of depth.

Choong CS, Priest JR and Foulkes WD. Exploring the endocrine manifestations of DICER1 mutations. Trends Mol Med. 2012; 18(9): 503-505. The discovery of each new cancer susceptibility gene answers one set of questions but poses many more. In this article, we outline a recent example: a new cancer syndrome caused by germline mutations in DICER1, responsible for microRNA processing. In particular, we discuss the endocrine manifestations of mutations in this crucial gene.


BACKGROUND: The study of typical morphological variations using quantitative, morphometric descriptors has always interested biologists in general. However, unusual examples of form, such as abnormalities, are often encountered in biomedical sciences. Despite the long history of morphometrics, the means to identify and quantify such unusual form differences remains limited. METHODS: A theoretical concept, called dysmorphometrics, is introduced augmenting current geometric morphometrics with a focus on identifying and modelling form abnormalities. Dysmorphometrics applies the paradigm of detecting form differences as outliers compared to an appropriate norm. To achieve this, the likelihood formulation of landmark superimpositions is extended with outlier processes explicitly introducing a latent variable coding for abnormalities. A tractable solution to this augmented superimposition problem is obtained using Expectation-Maximization. The topography of detected abnormalities is encoded in a dysmorphogram. RESULTS: We demonstrate the use of dysmorphometrics to measure abrupt changes in time, asymmetry and discordancy in a set of human faces presenting with facial abnormalities. CONCLUSION: The results clearly illustrate the unique power to reveal unusual form differences given only normative data with clear applications in both biomedical practice & research.


Sexual dimorphism in multiple aspects of 3D facial symmetry and asymmetry defined by spatially dense geometric morphometrics.

Accurate measurement of facial sexual dimorphism is useful to understanding facial anatomy and specifically how faces influence, and have been influenced by, sexual selection. An important facial aspect is the display of bilateral symmetry, invoking the need to investigate aspects of symmetry and asymmetry separately when examining facial shape. Previous studies typically employed landmarks that provided only a sparse facial representation, where different landmark choices could lead to contrasting outcomes. Furthermore, sexual dimorphism is only tested as a difference of sample means, which is statistically the same as a difference in population location only. Within the framework of geometric morphometrics, we partition facial shape, represented in a spatially dense way, into patterns of symmetry and asymmetry, following a two-factor anova design. Subsequently, we investigate sexual dimorphism in symmetry and asymmetry patterns separately, and on multiple aspects, by examining (i) population location differences as well as differences in population variance-covariance; (ii) scale; and (iii) orientation. One important challenge in this approach is the proportionally high number of variables to observations necessitating the implementation of permutational and computationally feasible statistics. In a sample of gender-matched young adults (18-25 years) with self-reported European ancestry, we found greater variation in male faces than in women for all measurements. Statistically significant sexual dimorphism was found for the aspect of location in both symmetry and asymmetry (directional asymmetry), for the aspect of scale only in asymmetry (magnitude of fluctuating asymmetry) and, in contrast, for the aspect of orientation only in symmetry. Interesting interplays with hypotheses in evolutionary and developmental biology were observed, such as the selective nature of the force underpinning sexual dimorphism and the genetic independence of the structural patterns of fluctuating asymmetry. Additionally, insights into growth patterns of the soft tissue envelope of the face and underlying skull structure can also be obtained from the results.

Cole CH.
Rapid update on childhood immune thrombocytopenic purpura.

Most childhood immune thrombocytopenic purpura is benign, self-limiting and requires no therapy. However, questions remain: (i) to treat or not; (ii) bone marrow examination or not; and (iii) admit to hospital or not. These questions have dominated the literature and we still need a prospective large multi-centre study of these issues to determine a useful bleeding score, quality of life measure and a measure of parental anxiety.

Conway NT, Wake ZV, Richmond PC, Smith DW, Keil AD, Williams S, Kelly H, Carcione D, Effler PV and Blyth CC.
Clinical Predictors of Influenza in Young Children: The Limitations of “Influenza-Like Illness”.
Journal of the Pediatric Infectious Diseases Society. 2012.

Predictors of Survival After Single-Ventricle Palliation: The Impact of Right Ventricular Dominance.
Objectives This study examined survival after surgical palliation in children with single-ventricle physiology. Background Contemporary surgical outcomes for the entire population of newborns undergoing single-ventricle palliation are unclear. Methods In a single-center review of 499 consecutive patients undergoing univentricular palliation from 1990 to 2008, predictors of mortality were determined using multivariate risk analysis, stratified for each post-operative stay and interim states. Results After 2000, the population comprised more patients with dominant right ventricle (66% vs. 36%) and hypoplastic left heart syndrome (HLHS) (47% vs. 13%). Median age at bidirectional cavopulmonary shunt (BCPS) decreased from 15 months (10 to 22 months) before 2000 to 4 months (3.3 to 9 months) thereafter. Survival rates at 1, 5, and 10 years were, respectively, 82% (95% confidence interval [CI]: 79% to 85%), 74% (95% CI: 70% to 78%), and 71% (95% CI: 67% to 75%). Throughout the study, atrioventricular valve regurgitation (hazard ratio [HR]: 1.8; p = 0.008), not having transposition (HR: 2.0; p = 0.013), and heterotaxia (HR: 2.0; p = 0.026) were predictors of mortality. The most potent risk factor was right ventricular (RV) dominance (HR: 2.2; p = 0.001) because of its impact before BCPS. HR for death in patients with RV dominance went from 2.8 (95% CI: 1.4 to 5.7; p = 0.005) before BCPS to 1.0 (95% CI: 0.5 to 2.1; p = 0.98) thereafter. Survival of patients with RV dominance, adjusted for the risk factors noted here, improved over the study period (p = 0.001). Conclusions Considerable mortality is still observed during the first years of life among patients with single ventricle. RV dominance is the most important risk factor for death but only before BCPS.

D’Vaz N, Meldrum SJ, Dunstan JA, Lee-Pullen TF, Metcalfe J, Holt BJ, Serralha M, T unic MK, Mori TA and Prescott SL.
Fish oil supplementation in early infancy modulates developing infant immune responses.
Clinical & Experimental Allergy. 2012; 42(8): 1206-1216.

D’Vaz N, Meldrum SJ, Dunstan JA, Martino D, McCarthy S, Metcalfe J, Tunic MK, Mori TA and Prescott SL.
Postnatal fish oil supplementation in high-risk infants to prevent allergy: randomized controlled trial.
BACKGROUND AND OBJECTIVE: Relative deficiency of dietary omega 3 polyunsaturated fatty acids (n-3 PUFA) has been implicated in the rising allergy prevalence in Westernized countries. Fish oil supplementation may provide an intervention strategy for primary allergy prevention. The objective of this study was to assess the effect of fish oil n-3 PUFA supplementation from birth to 6 months of age on infant allergic disease. METHODS: In a double-blind randomized controlled trial, 420 infants at high atopic risk received a daily supplement of fish oil containing 280 mg docosahexaenoic acid and 110 mg eicosapentaenoic acid or a control (olive oil), from birth to age 6 months. PUFA levels were measured in 6-month-old infants’ erythrocytes and plasma and their mothers’ breast milk. Eczema, food allergy, asthma and sensitization were assessed in 323 infants for whom clinical follow-up was completed at 12 months of age. RESULTS: At 6 months of age, infant docosahexaenoic acid and eicosapentaenoic acid levels were significantly higher (both P < .05) and erythrocyte arachidonic acid levels were lower (P = .003) in the fish oil group. Although n-3 PUFA levels at 6 months were associated with lower risk of eczema (P = .033) and recurrent wheeze (P = .027), the association with eczema was not significant after multiple comparisons and there was no effect of the intervention per se on the primary study outcomes. Specifically, between-group comparisons revealed no differences in the occurrence of allergic outcomes including sensitization, eczema, asthma, or food allergy. CONCLUSIONS: Postnatal fish oil supplementation improved infant n-3 status but did not prevent childhood allergic disease.

Dobrovoljac M and Geelhoed GC.
How fast does oral dexamethasone work in mild to moderately severe croup? A randomized double-blinded clinical trial.
OBJECTIVE: For children with croup controversy remains over dosage and time to onset of action of oral steroids. The Cochrane Collaboration and other reviews have suggested 0.6 mg/kg dexamethasone be used (despite some evidence that 0.15 mg/kg is effective) with no expectation of benefit before 4-6 h. This randomized double-blinded clinical trial examines whether 0.15 mg/kg dexamethasone works by 30 min. METHODS: Children with croup aged above 6 months presenting to a tertiary paediatric ED with a Westley croup score of mild to moderate range (scores 1-6 out of 17) were randomized to receive either 0.15 mg/kg dexamethasone or oral placebo solution. Vital signs and croup score were recorded at study entry and every 10 min up to 1 h after administration of the study drug. The main outcome measure was croup score at 30 min. RESULTS: Each group contained 35 children. Baseline characteristics were similar, except for respiratory rate, which was higher in the placebo group. There was a growing trend to a lower croup score in the dexamethasone group, evident from 10 min and statistically significant from 30 min. CONCLUSION: For children with croup an oral dose of 0.15 mg/kg dexamethasone offers benefit by 30 min, much earlier than the 4
h suggested by the Cochrane Collaboration. This result might encourage doctors to treat more children with all severities of croup being less worried about potential side-effects and delayed benefit.


Limited data are available to assess the long-term effects of burns to the trunk sustained during early childhood on subsequent pregnancies. This population-based retrospective longitudinal study uses linked Western Australia hospital morbidity and midwives notification data for the period 1983-2008. During the study period, 824 girls younger than 15 years with non-erythema burns (partial thickness, full thickness, or unspecified burn depth) to the trunk were hospitalized in Western Australia. During the follow-up, 134 subjects with burns to the trunk during childhood were identified as having later pregnancies. The mean age at admission for burn injury was 5.7 +/- 4.0 years, and the majority of burns were caused by scalds (51.5%) and flame (37.3%). For these subjects (N = 134), there were a total of 213 subsequent pregnancies. All pregnancies resulted in full-term live births. There were 142 (64.3%) vaginal deliveries, 26 (12.2%) breech or instrument, and 45 (21.2%) deliveries were by cesarean section. No admissions for scar conditions or revisions of burn scar or contracture were identified during any pregnancy (first to fourth) for subjects with burns to the trunk. Mode of delivery was not statistically significantly different from that experienced by subjects with burns sustained during childhood to other anatomical sites. For subjects in this study with less severe burns to the trunk, no specific detrimental impacts during pregnancy or delivery or to the fetus were identified. Further surveillance is required to gauge an accurate assessment of complications associated with severe trunk burns sustained during childhood.


We studied the effect of intravenous lidocaine on laryngeal and respiratory reflex responses in children anaesthetised with sevoflurane. We tested the hypothesis that the incidence of laryngospasm evoked by laryngeal stimulation is temporarily diminished after the administration of lidocaine. Forty children, aged between 25 and 84 months, were anaesthetised with sevoflurane and breathed spontaneously through a laryngeal mask airway. Respiratory reflex responses were elicited by spraying distilled water onto the laryngeal mucosa at three time intervals: (i) before lidocaine was administered (baseline); (ii) at 2 min and (iii) at 10 min following the intravenous administration of a bolus of lidocaine 2 mg.kg(-1). A blinded reviewer assessed the evoked responses. The incidence of laryngospasm was reduced from 38% at baseline to 15% 2 min after lidocaine administration (p < 0.02) and 18% 10 min after lidocaine administration (p = 0.10). We conclude that intravenous lidocaine significantly reduced the incidence of laryngospasm but that the effect was short-lived.


Context: Recently we showed that a 10-sec maximal sprint effort performed before or after moderate intensity exercise can prevent early hypoglycemia during recovery in individuals with type 1 diabetes mellitus (T1DM). However, the mechanisms underlying this protective effect of sprinting are still unknown. Objective: The objective of the study was to test the hypothesis that short duration sprinting increases blood glucose levels via a disproportionate increase in glucose rate of appearance (Ra) relative to glucose rate of disappearance (Rd). Subjects and Experimental Design: Eight T1DM participants were subjected to a euglycemic-euinsulinemic clamp and, together with nondiabetic participants, were infused with [6,6-(2)H]glucose before sprinting for 10 sec and allowed to recover for 2 h. Results: In response to sprinting, blood glucose levels increased by 1.2 +/- 0.2 mmol/liter (P < 0.05) within 30 min of recovery in T1DM participants and remained stable afterward, whereas glycemia rose by only 0.40 +/- 0.05 mmol/liter in the nondiabetic group. During recovery, glucose Ra did not change in both groups (P > 0.05), but glucose Rd in the nondiabetic and diabetic participants fell rapidly after exercise before returning within 30 min to preexercise levels. After sprinting, the levels of plasma epinephrine, norepinephrine, and GH rose transiently in both experimental groups (P < 0.05). Conclusion: A sprint as short as 10 sec can increase plasma glucose levels in nondiabetic and T1DM individuals, with this rise resulting from a transient decline in glucose Rd rather than from a disproportionate rise in glucose Ra relative to glucose Rd as reported with intense aerobic exercise.

The clinical understanding of the CDKL5 disorder remains limited, with most information being derived from small patient groups seen at individual centres. This study uses a large international data collection to describe the clinical profile of the CDKL5 disorder and compare with Rett syndrome (RTT). Information on individuals with cyclin-dependent kinase-like 5 (CDKL5) mutations (n=86) and females with MECP2 mutations (n=920) was sourced from the InterRett database. Available photographs of CDKL5 patients were examined for dysmorphic features. The proportion of CDKL5 patients meeting the recent Neul criteria for atypical RTT was determined. Logistic regression and time-to-event analyses were used to compare the occurrence of Rett-like features in those with MECP2 and CDKL5 mutations. Most individuals with CDKL5 mutations had severe developmental delay from birth, seizure onset before the age of 3 months and similar non-dysmorphic features. Less than one-quarter met the criteria for early-onset seizure variant RTT. Seizures and sleep disturbances were more common than in those with MECP2 mutations whereas features of regression and spinal curvature were less common. The CDKL5 disorder presents with a distinct clinical profile and a subtle facial, limb and hand phenotype that may assist in differentiation from other early-onset encephalopathies. Although mutations in the CDKL5 gene have been described in association with the early-onset variant of RTT, in our study the majority did not meet these criteria. Therefore, the CDKL5 disorder should be considered separate to RTT, rather than another variant.


AIMS: To evaluate the effect of a structured preoperative preparation on child and parent state anxiety, child behavioural change and parent satisfaction. BACKGROUND: It is estimated that around 50-70% of hospitalised children experience severe anxiety and distress prior to surgery. Children who are highly anxious and distressed preoperatively are likely to be distressed on awakening and have negative postoperative behaviour. Although education before surgery has been found to be useful mostly in North America, the effectiveness of preoperative preparation programme adapted to the Australian context remains to be tested. DESIGN: This single-blind randomised controlled study was conducted at a tertiary referral hospital for children in Western Australia. METHODS: Following ethics approval and parental consent, 73 children and one of their carers (usually a parent) were randomly assigned into two groups. The control group had standard practice with no specific preoperative education and the experimental group received a preoperative preparation, including a photo file, demonstration of equipment using a role-modelling approach and a tour. RESULTS: The preoperative preparation reduced parent state anxiety significantly (-2.32, CI -4.06 to -0.56, p = 0.009), but not child anxiety (-0.59, CI -1.23 to 0.06, p = 0.07). There was no significant difference in child postoperative behaviour or parent satisfaction between the groups. There was a significant two-point pain score reduction in the preoperative preparation group, when compared with the control group median 2 (IQR 5) and 4 (IQR 4), respectively (p = 0.001). CONCLUSIONS: Preoperative preparation was more efficient on parent than child. Although the preoperative preparation had limited effect on child anxiety, it permitted to decrease pain experience in the postoperative period. RELEVANCE TO CLINICAL PRACTICE: Parents should be actively involved in their child preoperative preparation.


Tuberous sclerosis complex (TSC) is an autosomal dominant genodermatosis characterised by the development of hamartomatous tumours in multiple organs including the brain, skin, kidneys, heart and lungs. Facial angiofibromas are the most visible and unsightly of the cutaneous manifestations of TSC, often resulting in stigmatisation for both the affected individuals and their families. Current treatments include vascular laser, ablative lasers and other destructive techniques such as shave excision and electrodesiccation. For the best outcome these treatments have to be repeated throughout childhood and teenage years, necessitating multiple general anaesthetics. We report a pilot study of topical rapamycin in four children with TSC and facial angiofibromas. Two patients were trialled on 0.1% rapamycin in petrolatum and the other two patients with 0.1% rapamycin solution (Rapamune) applied topically. Both preparations were rapidly and equally effective, however the 0.1% in petrolatum was much better tolerated. Younger patients with smaller angiofibromas had the best response with near complete clearance. Both preparations were more cost effective than pulsed dye laser
under general anaesthesia. Although larger studies are needed, this treatment shows a potential to be a first-line management for facial angiofibromas in TSC and appears safe to start in early childhood.

Francis J, Mutch RC, Rutherford DM and Cherian S.
Universal paediatric refugee health screening.

Fricke TA, d’Udekem Y, Richardson M, Thuy C, Dronavalli M, Ramsay JM, Wheaton G, Grigg LE, Brizard CP and Konstantinov IE
Outcomes of the Arterial Switch Operation for Transposition of the Great Arteries: 25 Years of Experience.
Background Studies on long-term outcomes of the arterial switch operation (ASO) for transposition of the great arteries (TGA) are uncommon. Thus, we sought to determine the long-term outcomes for patients after ASO performed at a single institution over a 25-year period. Methods From 1983 to 2009, 618 patients underwent the ASO for TGA and were reviewed retrospectively. Results Overall early mortality was 2.8%. Risk factors for early death on multivariate analysis were resection of left ventricular outflow tract obstruction at time of ASO (p = 0.001), weight less than 2.5 kg at time of ASO (p &lt; 0.001), associated aortic arch obstruction (p = 0.043), and the need for postoperative extracorporeal membrane oxygenation (p &lt; 0.001). Mean follow-up time was 10.6 years (range 2 months to 26.1 years). Late mortality was 0.9%. Reintervention was significantly higher (p &lt; 0.001) in patients with ventricular septal defect or arch obstruction versus those without them (25.2% and 23.4% vs 5.9% at 15-year follow-up). Risk factors for late reintervention were left ventricular outflow tract obstruction at time of ASO (p &lt; 0.001) and a greater circulatory arrest time (p &lt; 0.001). Freedom from at least moderate neoaortic valve regurgitation for the entire cohort was 98.7% (95% confidence interval 96.8 to 99.5%) at 20 years. Mild neoaortic regurgitation was seen in 25.6% of patients at mean follow-up. All patients were free of arrhythmia and heart failure symptoms at last follow-up. Conclusions The ASO can be performed with good long-term results. Patients with associated ventricular septal defect and aortic arch obstruction warrant close follow-up.

Geelhoed GC and de Klerk NH.
Emergency department overcrowding, mortality and the 4-hour rule in Western Australia.
OBJECTIVE: To assess whether emergency department (ED) overcrowding was reduced after the introduction of the 4-hour rule in Western Australia and whether any changes in overcrowding were associated with significant changes in patient mortality rates. DESIGN, SETTING AND PATIENTS: Quasi-experimental intervention study using dependent pretest and post-test samples. Hospital and patient data were obtained for three tertiary hospitals and three secondary hospitals in Perth, WA, for 2007-08 to 2010-11. MAIN OUTCOME MEASURES: Mortality rates; overcrowding rates. RESULTS: No change was shown in mortality from 2007-08 to 2010-11 for the secondary hospitals and from 2007-08 to 2009-10 for the tertiary hospitals. ED overcrowding (as measured by 8-hour access block) at the tertiary hospitals improved dramatically, falling from above 40% in July 2009 to around 10% by early 2011, and presentations increased by 10%, while the mortality rate fell significantly (by 13%; 95% CI, 7%-18%; P < 0.001) from 1.12% to 0.98% between 2009-10 and 2010-11. Monthly mortality rates decreased significantly in two of the three tertiary hospitals concurrently with decreased access block and an increased proportion of patients admitted in under 4 hours. CONCLUSION: Introduction of the 4-hour rule in WA led to a reversal of overcrowding in three tertiary hospital EDs that coincided with a significant fall in the overall mortality rate in tertiary hospital data combined and in two of the three individual hospitals. No reduction in adjusted mortality rates was shown in three secondary hospitals where the improvement in overcrowding was minimal.

Gill F, Corkish V, Robertson J, Samson J, Simmons B and Stewart D.
An exploration of pediatric nurses' compliance with a medication checking and administration protocol.
PURPOSE: This study examined nurses' reported compliance with the medication administration protocol and explored reasons for noncompliance. DESIGN AND METHOD: A mixed-methods design incorporated a questionnaire (n= 72) and focus groups (n= 24). RESULTS: Differences were found between the level of experience and protocol compliance. Noncompliance was widespread in the checking of identification bands and double-checking medications. Key factors influencing compliance were ward culture, type of drug, familiarity with patient and drug, and workload. The reported realities of practice were found to influence compliance with the medication administration protocol. PRACTICE IMPLICATIONS: The discrepancies between protocol and practice in this setting underscore the need to more widely investigate compliance with medication administration protocols in other settings.
Gill FJ, Leslie GD, Grech C and Latour JM. A review of critical care nursing staffing, education and practice standards. Aust Crit Care. 2012; 25(4): 224-237. The aim of this paper is to review the differences and similarities in critical care nursing staffing, education and practice standards in the US, Canada, UK, New Zealand and Australia. SEARCH METHODS: A university library discovery catalogue, Science Direct, Scopus databases and professional websites were searched. Key terms used included, critical care, specialist, standards, competency, practice, scope, workforce, staffing, ratios, qualifications, adverse events, and patient outcomes. The search was limited to articles that referred to critical care environments including paediatric and neonatal settings. RESULTS: The database and hand search identified 40 relevant articles. Website searching resulted in a further 36 documents. A diversity of critical care nursing contexts and a lack of comparable workforce data made it difficult to quantify differences and similarities between countries. There is a general consensus about the importance of optimum staffing by registered nurses with a proportion of those holding relevant post-registration qualifications although there is no consistency in defining the educational preparation for a ‘qualified’ critical care nurse. Critical care nursing standards for the US, Canada, UK and New Zealand were predominantly developed by expert panels while the Australian standards were developed with a multi-methods study including observations of practice. All five standards documents were built upon national entry-to-practice nurse standards and contained similar constructs, although there was no construct common to all of the standards. CONCLUSION: There is a lack of evidence to support nursing staffing with post registration specialty qualifications. Existing standards are predominantly opinion based rather than supported by research. The expected standards for nursing practice are fundamentally similar.


Letter

Guergueltcheva V, Azmanov Dimitar N, Angelicheva D, Smith Katherine R, Chamova T, Florez L, Bynevelt M, Nguyen T, Cherninkova S, Bojinova V, KAPrelyan A, Angelova L, Morar B, Chandler D, Kaneva R, Bahlo M, Tournev I and Kalaydjieva L. Autosomal-Recessive Congenital Cerebellar Ataxia Is Caused by Mutations in Metabotropic Glutamate Receptor 1. The American Journal of Human Genetics. 2012; [Epub ahead of print]. Autosomal-recessive congenital cerebellar ataxia was identified in Roma patients originating from a small subisolate with a known strong founder effect. Patients presented with global developmental delay, moderate to severe stance and gait ataxia, dysarthria, mild dysdiadochokinesia, dysmetria and tremors, intellectual deficit, and mild pyramidal signs. Brain imaging revealed progressive generalized cerebellar atrophy, and inferior vermal hypoplasia and/or a constitutionally small brain were observed in some patients. Exome sequencing, used for linkage analysis on extracted SNP genotypes and for mutation detection, identified two novel (i.e., not found in any database) variants located 7 bp apart within a unique 6q24 linkage region. Both mutations cosegregated with the disease in five affected families, in which all ten patients were homozygous. The mutated gene, GRM1, encodes metabotropic glutamate receptor mGlur1, which is highly expressed in cerebellar Purkinje cells and plays an important role in cerebellar development and synaptic plasticity. The two mutations affect a gene region critical for alternative splicing and the generation of receptor isoforms; they are a 3 bp exon 8 deletion and an intron 8 splicing mutation (c.2652_2654del and c.2660+2T&gt;G, respectively [RefSeq accession number NM_000838.3]). The functional impact of the deletion is unclear and is overshadowed by the splicing defect. Although ataxia lymphoblastoid cell lines expressed GRM1 at levels comparable to those of control cells, the aberrant transcripts skipped exon 8 or ended in intron 8 and encoded various species of nonfunctional receptors either lacking the transmembrane domain and containing abnormal intracellular tails or completely missing the tail. The study implicates mGlur1 in human hereditary ataxia. It also illustrates the potential of the Roma founder populations for mutation identification by exome sequencing.

Ha JF, Wood B, Krishnaswamy J and Rajan GP. Incomplete Cochlear Partition Type II Variants as an Indicator of Congenital Partial Deafness: A First Report. Otol Neurotol. 2012; 33(6): 957-962. INTRODUCTION: The increased understanding on the impact of partial deafness (PD) with residual low-frequency hearing has led to new hearing rehabilitation strategies using hearing preservation techniques during cochlear implantation with the aim to make use of the combined electric acoustic stimulation (EAS) in the affected ear. As a first report, we describe minor forms of the incomplete cochlear partition Type II (IP- II) involving the apical 1.5 turns, which were found in the majority of our patients presenting with congenital PD. We investigated the hearing preservation rates and hearing outcomes of these patients after EAS cochlear
implantation (EAS-CI). MATERIALS AND METHODS: We present a review of a case series of 4 children and 1 adult with documented congenital PD. They all underwent audiologic and radiologic assessment for CI. Hearing preservation rates and speech perception outcomes were assessed at 1, 3, 6, 12, and 24 months after EAS-CI. RESULTS: Three (75%) of the 4 pediatric patients and 1 adult patient with congenital PD showed the pattern of isolated IP-II variants involving the apical 1.5 cochlear turns with a normal basal turn, without associated inner ear anomalies. Complete hearing was preserved in all patients. Speech performance improved significantly in all patients. CONCLUSION: As a first report, we describe minor IP-II variants identified in the majority of our patients with congenital PD; these IP-II variants could be useful as an indicator of malformation for congenital PD. Detection requires careful radiologic evaluation of the cochlea. EAS-CI is not a contraindication in these patients and should be considered early to prevent permanent speech and language deficits.


Background The anti-inflammatory peptide, adrenomedullin (AM), and its cognate receptor are expressed in lung tissue, but its pathophysiological significance in airway inflammation is unknown. Objectives This study investigated whether allergen-induced airway inflammation involves an impaired local AM response. Methods Airway AM expression was measured in acute and chronically sensitized mice following allergen inhalation and in airway epithelial cells of asthmatic and nonasthmatic patients. The effects of AM on experimental allergen-induced airway inflammation and of AM on lung epithelial repair in vitro were investigated. Results Adrenomedullin mRNA levels were significantly (P < 0.05) reduced in acute ovalbumin (OVA)-sensitized mice after OVA challenge, by over 60% at 24 h and for up to 6 days. Similarly, reduced AM expression was observed in two models of chronic allergen-induced inflammation, OVA- and house dust mite–sensitized mice. The reduced AM expression was restricted to airway epithelial and endothelial cells, while AM expression in alveolar macrophages was unaltered. Intranasal AM completely attenuated the OVA-induced airway hyperresponsiveness and mucosal plasma leakage but had no effect on inflammatory cells or cytokines. The effects of inhaled AM were reversed by pre-inhalation of the putative AM receptor antagonist, AM (22-52). AM mRNA levels were significantly (P < 0.05) lower in human asthmatic airway epithelial samples than in nonasthmatic controls. In vitro, AM dose-dependently (10–110–7 M) accelerated experimental wound healing in human and mouse lung epithelial cell monolayers and stimulated epithelial cell migration. Conclusion Adrenomedullin suppression in TH2-related inflammation is of pathophysiological significance and represents loss of a factor that maintains tissue integrity during inflammation.


We aimed to ascertain the fit of the European Respiratory Society Global Lung Initiative 2012 reference ranges to contemporary Australasian spirometric data. Z-scores for spirometry from Caucasian subjects aged 4-80 years were calculated. The mean (SD) Z-scores were 0.23 (1.00) for forced expiratory volume in 1 s (FEV1), 0.23 (1.00) for forced vital capacity (FVC), -0.03 (0.87) for FEV1/FVC and 0.07 (0.95) for forced expiratory flows between 25% and 75% of FVC. These results support the use of the Global Lung Initiative 2012 reference ranges to interpret spirometry in Caucasian Australasians.

Hamilton ND, Hegarty M, Calder A, Erb TO and von Ungern-Sternberg BS.


BACKGROUND: The use of topical lidocaine, applied to the airways with various administration techniques, is common practice in pediatric anesthesia in many institutions. However, it remains unclear whether these practices achieve their intended goal of reducing the risk of perioperative respiratory adverse events (PRAE) in children undergoing elective endotracheal intubation without neuromuscular blockade (NMB). The relative frequency of PRAE (laryngospasm, coughing, desaturation <95%) associated with no use of topical airway lidocaine (TAL), with TAL sprayed directly onto the vocal cords, and TAL administered blindly into the pharynx was assessed. METHODS: This prospective audit involved 1000 patients undergoing general anesthesia with elective endotracheal intubation without NMB. Patients with suspected difficult airways or undergoing airway surgery were excluded. The use of TAL and the mode of administration were recorded. Respiratory adverse events were recorded in the perioperative period. RESULTS: Two hundred and fifty-four patients had the vocal cords sprayed under direct vision, 236 had lidocaine blindly dripped into the pharynx, and 510 received no TAL. The mean age and known risk factors for PRAE (asthma, recent upper respiratory tract infection (<2 weeks),
Delivering a Healthy WA

passive smoking, hayfever, past or present eczema, nocturnal dry cough) were similar among the groups. The proportion of patients with desaturation (<95%) between induction of anesthesia and discharge from the recovery room was higher in the two groups who received TAL (data combined for all patients receiving lidocaine regardless of administration method, P = 0.01) compared to those who received no TAL. No difference in the rates of laryngospasm (P = 0.13) or cough (P = 0.07) was observed among the groups. There was no difference in the rates of PRAE between the groups given TAL directly onto the vocal cords and in those whom received TAL blindly. CONCLUSIONS: The incidence of desaturation was higher in patients receiving TAL compared with children who did not. This association should perhaps be considered when contemplating the use of this technique.

Hansford JR, Cole C, Blyth CC and Gottardo NG.
Idiosyncratic nature of voriconazole photosensitivity in children undergoing cancer therapy.
Research Letter

Hauck YL, Bayes SJ and Robertson JM.
Addressing the workplace needs of Western Australian midwives: a Delphi study.
Abstract
Objective. To determine the workplace needs of Western Australian midwives working in public metropolitan secondary hospitals.
Method. Using a three-round Delphi approach, Round 1 incorporated focus groups and a questionnaire. Fifteen focus groups were conducted with midwives also having the option of contributing through an open-ended questionnaire. During Round 2, 38 items reflecting seven themes were prioritised with a final ranking performed in Round 3. In total, 114 midwives participated in Round 1, 72 in Round 2 and 89 in Round 3.
Results. During Round 1, workplace needs identified as being met included: working across all areas of midwifery; ability to work in areas of interest; opportunity to work with low to moderate risk women; supportive colleagues; accessible parking; hospital close to home and friendly work atmosphere. Round 2 items revealed the top five needs as: adequate midwifery staff coverage; access to maintained equipment; competitive pay scales; patient safety issues and opportunities to implement midwifery models. The top ranked needs from Round 3 included: recognising the unpredictable nature of midwifery services; provision of competent medical coverage, and adequate midwifery staff coverage.
Conclusions. Demand for maternity services is unpredictable; however, in order to maintain a sustainable maternity workforce, WA midwives’ prioritised needs would suggest health management focus upon expanding the availability of midwifery models of care, fostering flexible working conditions and ensuring collaboration between maternity health professionals occurs within clinically safe staffing levels.

Haynes A, Bulsara MK, Bower C, Jones TW and Davis EA.
Cyclical variation in the incidence of childhood type 1 diabetes in Western Australia (1985-2010).
OBJECTIVE: To examine the incidence of childhood type 1 diabetes in Western Australia from 1985-2010.
RESEARCH DESIGN AND METHODS: Incidence rates were calculated for children aged 0-14 years and were analyzed by calendar year, sex, and age at diagnosis. RESULTS: There were 1,873 cases, and the mean incidence was 18.1/100,000 person-years (95% CI: 17.5-19.2). The incidence increased by 2.3% a year (1.6-2.9%) with a sinusoidal 5-year cyclical variation of 14% (7-22%). The lowest rate of increase in incidence was observed in 0-4-year-olds. CONCLUSIONS: The cyclical pattern in incidence observed supports the role of environmental factors in childhood type 1 diabetes.

Hegarty M, Erb TO and Von Ungern-Sternberg BS.
Letter

Hosking J, Zoaanetti D, Carlyle A, Anderson P and Costi D.
Anesthesia for Treacher Collins syndrome: a review of airway management in 240 pediatric cases.
Objectives: To review airway management with anesthesia for children with Treacher Collins syndrome (TCS) and determine whether intubation was more difficult with increasing age. Background: Treacher Collins syndrome is a rare disorder of craniofacial development characterized by maxillary, zygomatic, and mandibular dysplasia. TCS is associated with difficult intubation, but reports of airway management are limited to case
reports and small cases series. Children with TCS may require multiple general anesthetics, and it has been suggested that intubation becomes more difficult with increasing age. Methods: A retrospective case note review of children with TCS from birth to 18 years undergoing anesthesia from 1971 to 2011 in a single center was performed. Demographic data, procedure type, anesthesia type, method of airway management, modified Cormack-Lehane (MCL) grade of laryngoscopic view, and any other descriptions of airway difficulty or complications were collated. Results: Of 59 patients with TCS, 35 children underwent a total of 240 anesthetics, most commonly for craniofacial surgery. Final airway management consisted of face mask 17%, laryngeal mask airway 16%, endotracheal intubation 49%, and 18% had a preexisting tracheostomy. The laryngeal mask airway provided an adequate airway in all cases when it was used. MCL grade was recorded in 97 cases involving 28 patients: 7% grade 1, 9% grade 2a, 31% grade 2b, 26% grade 3, and 27% grade 4. Fifteen (54%) patients were MCL grade 4 on at least one occasion. Failed intubation occurred in 6 (5%) of 123 cases of planned intubation. The procedure was canceled in two cases (0.8%) because of failure to intubate. Intubation techniques other than conventional direct laryngoscopy were used in 41% of cases. MCL grade increased with increasing age (P = 0.007). Conclusions: Most children with TCS have difficult laryngoscopic views with many requiring specialized intubation techniques. Direct laryngoscopy becomes more difficult with increasing age. The laryngeal mask airway is a good choice of airway when endotracheal intubation is not required.

Howard PF, McCaw JM, Richmond PC, Nissen M, Sloots T, Lambert SB, Lai M, Greenberg M, Nolan T and McVernon J. Virus detection and its association with symptoms during influenza-like illness in a sample of healthy adults enrolled in a randomised controlled vaccine trial. Influenza and other respiratory viruses. 2012: [Epub ahead of print]. Background Viral respiratory infections are associated with significant morbidity and mortality. Many new aetiological agents have been described recently. Objectives We looked for respiratory viruses in a population-based sample of healthy adults with influenza-like illness (ILI). We investigated host and spatio-temporal associations with virus isolation and host, spatio-temporal and virus associations with self-reported symptoms. Patients/Methods We recruited 586 participants experiencing 651 illness episodes from a population of healthy adults enrolled in an influenza vaccine effectiveness trial. At ILI assessment visits, a respiratory swab was collected and tested for viruses using a combination of polymerase chain reaction (PCR) assays. Participants also completed a questionnaire detailing their clinical course in 336 episodes. Results Of 643 samples analysed, a virus was identified in 44%. Half were picornaviruses, with influenza and coronavirus the next most common. Individuals with influenza were significantly less likely to have been immunised than the reference (virus negative) population (OR = 0.52 (0.31, 0.87) P = 0.01). The mean symptom score (95% CI) reported by individuals with influenza was significantly higher than in all other episodes [Influenza: 10.2 (9.4, 10.9); Other: 7.4 (7.2, 7.7); Difference (95% CI): 2.5 (1.5, 3.5); P < 0.001]. In an analysis restricted to influenza-positive cases, the symptom score was not attenuated by vaccination. Conclusions Our findings indicate that a greater number of symptoms are displayed by individuals presenting with influenza confirmed ILI compared with other agents that cause ILI. While influenza vaccination reduced the probability of influenza virus detection, symptom score for influenza-positive ILI was not attenuated.

Hughes IP, Harris M, Choong CS, Ambler G, Cutfield W, Hofman P, Cowell CT, Werther G, Cotterill A, Davies PS and Australasian Paediatric Endocrine G. Growth hormone regimens in Australia: analysis of the first 3 years of treatment for idiopathic growth hormone deficiency and idiopathic short stature. Clinical endocrinology. 2012; 77(1): 62-71. OBJECTIVE: To investigate response to growth hormone (GH) in the first, second and third years of treatment for all idiopathic GH-deficient (GHD) and idiopathic short stature (ISS) patients in Australia. CONTEXT: Eligibility for subsidized GH treatment in Australia is determined on auxological criteria for the indication of Short Stature and Slow Growth (SSSG), which includes ISS (SSSG-ISS). The biochemical GHD (BGHD, peak GH < 10 mU/l) and SSSG indications are treated similarly: starting dose of 4.5 mg/m(2)/week with provision for incremental dosing. Some ISS patients were specifically diagnosed with familial short stature (SSSG-FSS). DESIGN: Responses for each year of treatment for BGHD, SSSG-ISS and SSSG-FSS cohorts were compared in relation to influencing variables and with international benchmarks. The effect of incremental dosing was assessed. PATIENTS: Australian BGHD, SSSG-ISS and SSSG-FSS patients who had completed 1, 2, or 3 years of treatment and were currently receiving GH. MEASUREMENTS: Growth hormone dose, change in height-standard deviation score (DeltaSDS) and growth velocity (GV). RESULTS: First-year response was 2-3 times greater than that in subsequent years: DeltaSDS(1st year) = 0.92, 0.50 and 0.46 for BGHD, SSSG-ISS and SSSG-FSS, respectively. Responses were similar to international reports and inversely related to age at commencement of GH. First-year GV-for-age for BGHD patients was similar to international standards for idiopathic GHD. However, girls had an inferior response to boys when treatment commenced at <6 years of age. First-year GV-for-age for SSSG-ISS/FSS patients was less than ISS standards. Dose increments
attenuated the first- to second-year decline in response to BGHD but marginally improved the responses for SSSG-ISS/FSS. CONCLUSIONS: The Australian auxology-based GH programme produces comparable responses to international programmes. A lower starting dose is offset by the initiation of treatment at younger ages. Incremental dosing does not appear optimal. A first-year dose of 6.4-6.9 mg/m(2)/week for GHD and 8.9 mg/m(2)/week for ISS with early commencement of GH treatment may be most efficacious.

Long-term Differences in Language and Cognitive Function After Childhood Exposure to Anesthesia.
BACKGROUND: Over the past decade, the safety of anesthetic agents in children has been questioned after the discovery that immature animals exposed to anesthetics display apoptotic neurodegeneration and long-term cognitive deficiencies. We examined the association between exposure to anesthesia in children under age 3 and outcomes in language, cognitive function, motor skills, and behavior at age 10.METHODS: We performed an analysis of the Western Australian Pregnancy Cohort (Raine) Study, which includes 2868 children born from 1989 to 1992. Of 2608 children assessed, 321 were exposed to anesthesia before age 3, and 2287 were unexposed.RESULTS: On average, exposed children had lower scores than their unexposed peers in receptive and expressive language (Clinical Evaluation of Language Fundamentals: Receptive [CELF-R] and Expressive [CELF-E]) and cognition (Colored Progressive Matrices [CPM]). After adjustment for demographic characteristics, exposure to anesthesia was associated with increased risk of disability in language (CELF-R: adjusted risk ratio [ARR], 1.87; 95% confidence interval [CI], 1.20–2.93, CELF-E: aRR, 1.72; 95% CI, 1.12–2.64), and cognition (CPM: aRR, 1.69; 95% CI, 1.13–2.53). An increased aRR for disability in language and cognition persisted even with a single exposure to anesthesia (CELF-R aRR, 2.41; 95% CI, 1.40–4.17, and CPM aRR, 1.73; 95% CI, 1.04–2.88).CONCLUSIONS: Our results indicate that the association between anesthesia and neuropsychological outcome may be confined to specific domains. Children in our cohort exposed to anesthesia before age 3 had a higher relative risk of language and abstract reasoning deficits at age 10 than unexposed children.

Ing RJ, Ames WA and Chambers NA.
Paediatric cardiomyopathy and anaesthesia.
‘Cardiomyopathy’ (CM) is defined by the World Health Organization as ‘a disease of the myocardium associated with cardiac dysfunction’. In a child, it is associated with a significant risk for anaesthesia. In addition, cardiac arrest under anaesthesia has been attributed to an undiagnosed CM. Care of these patients is complicated by the fact that there are several different forms of CM that have differing anaesthesia management goals, aimed at maintaining the patient's baseline haemodynamic variables of preload, heart rate, contractility, and afterload. With the emergence of new diagnostic tools, together with advances in cardiac imaging and improved treatment modalities (such as ventricular assist devices), the anaesthetic management of a child with a CM is evolving. This review describes the different forms of the disease in terms of pathology, aetiology, and clinical presentation. Dilated, hypertrophic, and restrictive CM are the most common forms. We examine recent advances in therapy, including the management of severe end-stage disease, while highlighting the specific anaesthetic considerations for children with each type of CM.

Johnson SR, Nolan RC, Grant MT, Price GJ, Siafarikas A, Bint L and Choong CS.
Sterile abscess formation associated with depot leuprorelin acetate therapy for central precocious puberty.
We describe a case of an 8 year old girl with central precocious puberty. She was commenced on 3 monthly intramuscular depot Leuprorelin acetate therapy, as a result of which she developed sterile abscesses. She was converted to daily subcutaneous Leuprorelin acetate therapy with no recurrence of the abscesses. The possible mechanisms for this reaction are described in the article.

Jones AP, Palmer D, Zhang G and Prescott SL.
Cord blood 25-hydroxyvitamin d3 and allergic disease during infancy.
OBJECTIVE: There has been growing interest in vitamin D insufficiency as a predisposing factor for allergy development based on immunoregulatory properties and epidemiological studies. The aim of this study was to investigate the association between vitamin D exposure in utero and allergic outcomes in the first year of life. METHODS: Cord blood (CB) vitamin D was measured in 231 high-risk infants from an Australian prospective birth cohort. CB 25-hydroxyvitamin D(3) (25[OH]D(3)) concentration was analyzed in relation to maternal vitamin D intake and the development of infant eczema, allergen sensitization, and immunoglobulin E-mediated food allergy. RESULTS: Maternal intake of supplemental vitamin D was significantly correlated with CB
25(OH)D(3) concentration (rho = 0.244, P = .003), whereas dietary vitamin D did not influence CB levels. There was significant seasonal variation in CB 25(OH)D(3) concentration suggesting that sunlight exposure was an important determinant. Lower CB vitamin D status was observed in infants that developed eczema (P = .018), and eczema was significantly more likely in those with concentrations <50 nmol/L in comparison with those with concentrations ≥75 nmol/L (odds ratio 2.66; 95% confidence interval 1.24-5.72; P = .012). This association remained significant after adjustment for multiple confounding factors. The associations between CB 25(OH)D(3) concentration and allergen sensitization, immunoglobulin E-mediated food allergy, and eczema severity (SCORing Atopic Dermatitis) were not significant. CONCLUSIONS: Reduced vitamin D status in pregnancy may be a risk factor for the development of eczema in the first year of life, reinforcing the need to explore the role of vitamin D exposure during development for disease prevention.


AIM: Observation of identical genetic changes in leukemia cells from monozygotic twin pairs has provided evidence for the in utero single clonal origin hypothesis of leukemia, with intraplacental metastasis the basis for concordance. Investigation of this rare mixed lineage leukemia (MLL) cytogenetic abnormality aims to provide further evidence of the genetic changes that underpin this aggressive form of leukemia in infants. METHOD: The clinical features of a monozygotic infant twin pair with acute lymphoblastic leukemia (ALL) are reported. Banded chromosomal analysis and fluorescent in situ hybridization were used for cytogenetic characterization of the leukemic cells. Immunophenotype was determined by flow cytometry and polymerase chain reaction was
used to determine the presence of FLT3-D835/I836 and FLT3-internal tandem duplication (ITD) mutations. RESULTS: The twins were seven weeks of age at diagnosis. Both had cytogenetic evidence for the t(11;11)(p32;q23) translocation. Trisomy X was present in a subpopulation of cells in one twin. Immunophenotypic profile at diagnosis was consistent with B precursor ALL (CD19, CD24, CD33 positive, weak CD13 positivity, CD10 negative) and both were negative for FLT3-D835/I836 and FLT3-ITD mutations. CONCLUSIONS: This is the first report of monochorionic monozygotic twins harboring the t(11;11)(p32;q23) translocation. Identification of this rare translocation in both twins, indicates a common stem line and provides further evidence for the intrauterine monoclonal origin for infant ALL with concordance explained by the shared circulation. Genetic diversity was observed in a subpopulation of cells from one twin at diagnosis. We must now utilize the sophisticated molecular biology tools available to capture changes at the genome-wide level to gain further insight into the complex events contributing to MLL leukemogenesis in infants.


This report describes single-nucleotide polymorphisms (SNPs) in the sheep major histocompatibility complex (MHC) class II and class III regions and provides insights into the internal structure of this important genomic complex. MHC haplotypes were deduced from sheep family trios based on genotypes from 20 novel SNPs representative of the class II region and 10 previously described SNPs spanning the class III region. All 30 SNPs exhibited Hardy-Weinberg proportions in the sheep population studied. Recombination within an extended sire haplotype was observed within the class II region for 4 of 20 sheep chromosomes, thereby supporting the presence of separated Ila and IIb subregions similar to those present in cattle. SNP heterozygosity varied across the class II and III regions. One segment of the class Ila subregion manifested very low heterozygosity for several SNPs spanning approximately 120 Kbp. This feature corresponds to a subregion within the human MHC class II region previously described as a ‘SNP desert’ because of its paucity of SNPs. Linkage disequilibrium (LD) was reduced at the junction separating the putative class IIb and Ila subregions and also between the class Ila and the class III subregions. The latter observation is consistent with either an unmapped physical separation at this location or more likely a boundary characterized by more frequent recombination between two conserved subregions, each manifesting high within-block LD. These results identify internal blocks of loci in the sheep MHC, within which recombination is relatively rare.


BACKGROUND: A delay in the diagnosis of developmental dislocation of the hip has many long-term consequences. This retrospective study was undertaken in order to establish an incidence of late-presenting developmental dislocation of the hip in Western Australia, and investigate possible causes for missed diagnoses. METHOD: Data were collected retrospectively from 1 January to 31 December 2010. Theatre records were searched for operative descriptions including the words ‘arthrogram hip’, ‘EUA hip’, ‘closed reduction hip’, ‘open reduction hip’ and ‘spica’. Medical records were checked to establish the demographic details and background history of cases identified. Delayed diagnosis of developmental dysplasia of the hip (DDH) was defined as a dislocated hip requiring operative reduction, diagnosed at age greater than 3 months. RESULTS: Seventeen children with 21 dislocated hips were identified. Age at diagnosis ranged from 6 months to 5 years. Girls accounted for 88.2% (15/17) and the left hip was involved two-thirds of the time (14/21). Bilateral dislocations were found in four children. CONCLUSION: This study has identified an incidence of late-presenting developmental hip dislocation of approximately three times the previously established rate. Possible reasons for this are explored. Additional retrospective audit is now underway, and changes are already in place to ensure that infants with DDH born in Western Australia are identified and treated as early as possible.

Logan J.
Electronic health information system implementation models - a review.

The implementation of clinical information systems and electronic medical records does not have a good track record. It is estimated that more than 50% of implementations fail. A review of electronic health information system (EHIS) models incorporating clinical information systems and electronic medical records was undertaken to determine the models developed and applied in health. Twenty one health and five non-health models were identified. The non-health models were included as a number of health models were derived from these. The findings and evaluation of the models has identified varying contents and results. The models identified were assessed to determine how these related to each other, whether models were tested and how, if benefits were identified and if costsavings were projected or realised. This review of EHIS implementation models has identified a need for clear definition of terms used, careful categorisation and for models to be comprehensive, extensive and rigorous if successful outcomes are to occur.

Ly TT, Jones TW, Griffiths A, Dart J, Davis EA, Stick S and Wilson A.

Hypoglycemia does not change the threshold for arousal from sleep in adolescents with type 1 diabetes.


Abstract Background: Nocturnal hypoglycemia is a significant problem for children and adolescents with type 1 diabetes. The counterregulatory hormone response to hypoglycemia is blunted in both patients with type 1 diabetes and healthy subjects during sleep. It is not known whether the threshold for arousal from sleep is also modified by hypoglycemia. To address this question we compared the acoustic arousal threshold from sleep during hypoglycemia and euglycemia in adolescents with type 1 diabetes. Methods: Adolescents with type 1 diabetes were studied on two occasions: under hypoglycemic and euglycemic conditions. During the hypoglycemia night, subjects underwent a hyperinsulinenic hypoglycemic clamp with nadir glucose level of 2.8 mmol/L. Hypoglycemia was initiated during stage 2 sleep and maintained during slow-wave sleep. During the euglycemia night, blood glucose was maintained at 5.5 mmol/L using the same clamp technique. The acoustic arousal threshold was determined in the first cycle of slow-wave sleep. Results: Seven subjects (mean±SE, 14.2±/−0.8 years old, mean glycosylated hemoglobin 8.1+/−0.3%, duration of diagnosis 2.5+/−0.5 years) completed both study nights. Arousal was only noted during acoustic testing and did not occur during hypoglycemia alone. The acoustic arousal threshold during slow-wave sleep was similar under both conditions: 79+/−8 dB during euglycemia and 71+/−6 dB (P=0.353) during hypoglycemia. Conclusion: In adolescents with type 1 diabetes, hypoglycemia does not impair arousal from slow-wave sleep induced by an external auditory stimulus.

Ly TT, Nicholas JA, Retterath A, Davis EA and Jones TW.

Analysis of glucose responses to automated insulin suspension with sensor-augmented pump therapy.


OBJECTIVE: The advent of sensor-augmented pump therapy with a low-glucose suspend (LGS) function (Medtronic Paradigm Veo System), allowing insulin to be automatically suspended for up to 2 h when sensor glucose falls below a preset threshold, has the potential to reduce the duration of hypoglycemia. In this article, we analyzed blood glucose profiles following a full 2-h insulin suspension activated by the LGS function, as well as examined different patterns of use among patients. RESEARCH DESIGN AND METHODS: Data from a cohort of participants using the Veo System for up to 6 months were analyzed to determine the time and duration of insulin suspension activated by the LGS function. We further evaluated overnight suspend events with no patient response occurring prior to 3:00 a.m., which allowed us to determine the pattern of sensor glucose values with no patient intervention during and after the period of insulin suspension. RESULTS: There were 3,128 LGS events during the 2,493 days evaluated. The median duration was 11.2 min, and 36% of events occurred overnight. There were 126 full 2-h suspend events that occurred overnight with no patient response, occurring before 3:00 a.m. For these events, the mean sensor glucose at the end of the 2-h suspend period was 99+/− 6 mg/dL ([m]means+/− SE) 5.5+/− 0.3 mmol/L). The mean sensor glucose 2 h after insulin delivery resumed was 155+/− 10 mg/dL (8.6+/− 0.6 mmol/L). There were no episodes of severe hypoglycemia or diabetic ketoacidosis. CONCLUSION: Analyses of sensor glucose patterns following insulin suspension activated by LGS suggest that this technology is safe and unlikely to be associated with adverse outcomes.


Enhanced interpretation of newborn screening results without analyte cutoff values.


Purpose:
To improve quality of newborn screening by tandem mass spectrometry with a novel approach made possible by the collaboration of 154 laboratories in 49 countries.

Methods:
A database of 767,464 results from 12,721 cases affected with 60 conditions was used to build multivariate pattern recognition software that generates tools integrating multiple clinically significant results into a single score. This score is determined by the overlap between normal and disease ranges, penetration within the disease range, differences between conditions, and weighted correction factors.

Results:
Ninety tools target either a single condition or the differential diagnosis between multiple conditions. Scores are expressed as the percentile rank among all cases with the same condition and are compared to interpretation guidelines. Retrospective evaluation of past cases suggests that these tools could have avoided at least half of 279 false-positive outcomes caused by carrier status for fatty-acid oxidation disorders and could have prevented 88% of known false-negative events.

Conclusion:
Application of this computational approach to raw data is independent from single analyte cutoff values. In Minnesota, the tools have been a major contributing factor to the sustained achievement of a false-positive rate below 0.1% and a positive predictive value above 60%.


The Pediatric infectious disease journal. 2012.

BACKGROUND:: Varicella in children, although usually mild, can cause hospitalization and rarely death. This study examined patterns of hospitalized children with varicella, and associated varicella genotypes, in four tertiary children's hospitals throughout Australia before and after varicella vaccine was introduced. METHODS:: We obtained coded data on discharge diagnoses from each hospital before (1999-2001) and after (2007-2010) varicella introduction in 2006, adding active surveillance to capture clinical features, complications and immunization history in the latter period. Varicella vesicles were swabbed and genotyping of varicella strains was performed by real-time PCR amplification. RESULTS:: Overall, a 68% reduction in coded hospitalizations [varicella; 73.2% (p<0.001), zoster; 40% (p=0.002)] occurred post-vaccine introduction. Of children with detailed clinical data (97 varicella and 18 zoster cases), 46 (40%) were immunocompromised. Only six of 32 (19%) age-eligible immunocompetent children were immunized. Complications, most commonly secondary skin infections (n=25) and neurologic conditions (n=14), occurred in 44% of children. There were no deaths; but three immunocompetent unimmunized children had severe multiple complications requiring intensive care. All strains genotyped were "wild-type" varicella, with Clade 1 (European origin) predominating. CONCLUSIONS:: Following varicella vaccine introduction, coverage of greater than 80% at 2 years of age was achieved, with varicella hospitalizations reduced by almost 70%. Of hospitalized children age-eligible for varicella vaccine, 80% were unimmunized, including all cases requiring intensive care.

Martino D, Bosco A, McKenna K, Hollams E, Mok D, Holt P and Prescott S.

T cell activation genes differentially expressed at birth in CD4+ T cells from children who develop IgE food allergy.
Allergy. 2012.


Effects of high-dose fish oil supplementation during early infancy on neurodevelopment and language: a randomised controlled trial.
Menon VJ, Corscadden KJ, Fuery A, Thornton RB, Kirkham L-AS, Richmond PC and Wiertsema SP. Children with otitis media mount a pneumococcal serotype specific serum IgG and IgA response comparable to healthy controls after pneumococcal conjugate vaccination. Vaccine. 2012; 30(20): 3136-3144. It has been suggested that otitis-prone children have an impaired antibody response. To investigate this in the context of pneumococcal vaccination, we used a multiplex bead-based assay to measure serum IgG and IgA levels against pneumococcal serotypes included in the 7-valent pneumococcal conjugate vaccine (PCV7: serotypes 4, 6B, 9V, 14, 18C, 19F and 23F) and 4 non-PCV7 serotypes (1, 5, 7F and 19A) in healthy (n = 43) and otitis-prone children (n = 75) before, 6 weeks after and 1 year after vaccination with one dose of PCV7. Pre-vaccination, otitis-prone children had significantly higher serum IgG levels against serotypes 4, 9V and 23F and against all non-PCV7 serotypes. One year following vaccination, there was no difference in IgG or IgA levels between healthy and otitis-prone children. The effect of the administration of one or two doses of PCV7 was investigated in otitis-prone children. After a second dose of PCV7, pneumococcal serotype specific IgG levels, but not IgA titres, were higher compared to the levels measured after the initial dose of PCV7. One year post PCV7 vaccination there was no difference in either IgG or IgA antibody levels to any of the PCV7 serotypes between children who received either one or two doses of PCV7. The finding that otitis-prone children do not have an impaired pneumococcal serotype-specific serum IgG or IgA response suggests that new pneumococcal conjugate vaccines may be immunogenic in otitis-prone children, however, further investigations are necessary to determine the clinical impact of such vaccines against the development of recurrent acute otitis media.


Misra DP, Salafia CM, Charles AK and Miller RK. Placental measurements associated with intelligence quotient at age 7 years. Journal of Developmental Origins of Health and Disease. 2012; 3(03): 190-197. We hypothesized that placental villous branching that is measured by disk chorionic plate expansion and disk thickness is correlated with factors also involved in regulation of branching growth of other fetal viscera (e.g. lung, kidney) including neuronal dendrites, and thus may be associated with variation in childhood intelligence quotient (IQ). IQ at age 7 years was assessed using the Wechsler Intelligence Scale for Children. Placental measures [placental weight (g), thickness (mm), chorionic plate surface diameters (cm), area (cm2), shape, and cord length and cord eccentricity] were independent variables in regression analyses of age 7-year IQ in 12,926 singleton term live born infants with complete placental data. Analyses were stratified on gender with adjustment for socioeconomic status, race, parity, gestational age, exact age at testing and centered parental ages. After adjustment for covariates, placental measurements were independently associated with IQ at age 7 years but results varied by gender. Chorionic plate diameters were only associated with higher IQ in girls. Placental thickness was positively associated with higher IQ for boys and girls. We have previously shown that placental measures affect age 7-year body mass index and diastolic blood pressure. Here we demonstrate that specific measures, placental chorionic plate diameters in girls and disk thickness, independent of gender, are correlated with age 7-year IQ. Further exploration of the possible interaction of these factors on the placental villous arborization reflected by the chorionic plate expansion and placental thickness that correlate with age 7-year IQ, as well as other age 7 somatic features as previously addressed, is indicated.


Mott LS, Park J, Murray CP, Gangell CL, de Klerk NH, Robinson PJ, Robertson CF, Ranganathan SC, Sly PD and Stick SM.

OBJECTIVE: To determine the incidence of and factors associated with vitamin D deficiency rickets in Australian children. DESIGN: 18-month questionnaire-based prospective observational study, using Australian Paediatric Surveillance Unit (APSU) data. SETTING: Australian paediatricians and child health workers, January 2006 - July 2007. PARTICIPANTS: Children aged <\= 15 years with vitamin D deficiency rickets (25-hydroxyvitamin D [25OHD] <\= 50 nmol/L, and elevated alkaline phosphatase levels (> 229 IU/L) and/or radiological rickets). MAIN OUTCOME MEASURES: Incidence of vitamin D deficiency rickets. Description of demographics, clinical presentation, identification and further analysis of overrepresented groups, and treatment regimens compared with best-practice guidelines. RESULTS: We identified 398 children with vitamin D deficiency (55% male; median age, 6.3 years [range, 0.2-15 years]). The overall incidence in children <\= 15 years of age in Australia was 4.9/100 000/year. All had a low 25OHD level (median, 28 nmol/L [range, 5-50 nmol]) and an elevated alkaline phosphatase level (median, 407 IU/L [range, 229-5443 IU/L]), and 48 (12%) were hypocalcaemic. Ninety-five children had wrist x-rays, of whom 67 (71%) had rachitic changes. Most (98%) had dark or intermediate skin colour and 18% of girls were partially or completely veiled. Most children were born in Africa (252, 63%) and 75% of children were refugees. Duration of exclusive breastfeeding was inversely related to serum vitamin D levels in children < 3 years of age. Empirical vitamin D treatment was given to 4% of children before diagnosis. CONCLUSIONS: Vitamin D deficiency rickets is a significant problem in Australia among known high-risk groups. Public health campaigns to prevent, identify and treat vitamin D deficiency, especially in high-risk groups, are essential.

Murray C.

Mutch RC, Cherian S, Nemba K, Geddes JS, Rutherford DM, Chaney GM and Burgner DP.
Aim: Children account for approximately half of the humanitarian refugees currently resettled in Australia. A multidisciplinary refugee health clinic (RHC) was established at the tertiary paediatric hospital in Western Australia to address burgeoning referrals of refugee children following voluntary post-resettlement health assessment. The aim of this study is to describe the epidemiology of common conditions in resettled paediatric refugees attending a tertiary multidisciplinary RHC. Methods: Standardised clinical and demographic data were routinely collected during first visit clinical assessment at the RHC. Descriptive analyses of the first 1026 children are presented. Results: One thousand twenty-six refugee children from 475 families and over 30 different ethnicities were described. Nine hundred twenty-seven (90.4%) children were referred following post-resettlement health assessment. Median age was 7.8 years. Common reasons for referral were: vitamin D deficiency (400, 39%), iron deficiency (226, 22%), positive Helicobacter pylori serology (206, 21%), poor appetite (175, 17.1%), and schistosomiasis (170, 16.6%). Comorbidities identified by the RHC included tinea capitis and corporis (297, 28.9%), and dental disease (228, 22.2%). Two-thirds of children (680, 66.3%) had at least one abnormal finding on clinical examination that identified pathologies that were not evident from the history. Three hundred eighty children (37%) were referred to sub-specialty services. Conclusions: A multidisciplinary paediatric RHC facilitated and strengthened the management of refugee children with multiple and complex health needs. Evidence-based culturally appropriate methods to identify developmental delay, psychological morbidity and quantify social needs of this vulnerable population remain uncertain. These findings are relevant to the continuing evolution of paediatric refugee health care in Australia and other high income countries.

Nagarajan L, Palumbo L and Ghosh S.
The clinical semiology of 61 neonatal seizures with EEG correlates, in 24 babies was analysed. Most seizures (89%) had multiple features during the EEG discharge. The seizures were classified using the prominent clinical feature at onset, and all features seen during the seizure, using an extended classification scheme. Oro-lingual features occurred most frequently at onset (30%), whereas ocular phenomena occurred most often during the seizure (70%). Oro-lingual, ocular and autonomic features were seen at onset in 55% of the seizures. Seizure onsets with clonic, tonic and hypomotor features were seen in 20%, 8% and 18% respectively. Clinico-electrical correlations were as follows. The EEG discharge involved both hemispheres in 54% of all seizures, in clonic seizures this was 93%. Focal clonic seizures were associated with EEG seizure onset from the contralateral hemisphere. Majority of the clonic and hypomotor seizures had a left hemisphere ictal EEG onset. Oro-lingual seizures frequently started from the right hemisphere, whereas ocular and autonomic seizures arose from either hemisphere. There was no significant difference in mortality, morbidity, abnormal neuroimaging and EEG background abnormalities in babies with or without clonic seizures. This study provides insights into neuronal networks that underpin electroclinical seizures, by analysing and classifying the obvious initial clinical features and those during the seizure.

The use of an automated, portable glucose control system for overnight glucose control in adolescents and young adults with type 1 diabetes.
OBJECTIVE: A key milestone in progress towards providing an efficacious and safe closed-loop artificial pancreas system for outpatient use is the development of fully automated, portable devices with fault detection capabilities to ensure patient safety. The ability to remotely monitor the operation of the closed-loop system would facilitate future physician-supervised home studies. RESEARCH DESIGN AND METHODS: This study was designed to investigate the efficacy and safety of a fully automated, portable, closed-loop system. The Medtronic Portable Glucose Control System (PGCS) consists of two subcutaneous glucose sensors, a control algorithm based on proportional-integral-derivative with insulin feedback operating from a BlackBerry Storm smartphone platform, Bluetooth radiofrequency translator, and an off-the-shelf Medtronic Paradigm Veo insulin pump. Participants with type 1 diabetes using insulin pump therapy underwent two consecutive nights of in-clinic, overnight, closed-loop control after a baseline open-loop assessment. RESULTS: Eight participants attended for 16 overnight studies. The PGCS maintained mean overnight plasma glucose levels of 6.4 +/- 1.7 mmol/L (115 +/- 31 mg/dL). The proportion of time with venous plasma glucose <3.9, between 3.9 and 8 (70 and 144 mg/dL), and >8 mmol/L was 7, 78, and 15%, respectively. The proportion of time the sensor glucose values were maintained between 3.9 and 8 mmol/L was greater for closed-loop than open-loop (84.5 vs. 46.7%; P < 0.0001), and time spent <3.3 mmol/L was also reduced (0.9 vs. 3%; P < 0.0001). CONCLUSIONS: These results suggest that the PGCS, an automated closed-loop device, is safe and effective in achieving overnight glucose control in patients with type 1 diabetes.

Octavia S, Sintchenko V, Gilbert GL, Lawrence A, Kell AD, Hogg G and Lan R.
Australia is experiencing a prolonged epidemic of pertussis that began in 2008. A total of 194 Bordetella pertussis isolates collected from 2008 through 2010 were typed by single-nucleotide polymorphism (SNP) analysis, by multilocus variable number tandem repeats analysis, and by fim3, prn, and ptxP sequence analyses. Strains with 2 closely related SNP profiles carrying prn2 and ptxP3 from the recently emerged SNP cluster I predominated. The data suggest increasing selection among the B. pertussis population in Australia in favor of strains carrying prn2 and ptxP3 under the pressure of acellular vaccine–induced immunity.

Oudijk L, den Bakker MA, Hop WC, Cohen M, Charles AK, Alaggio R, Coffin CM and de Krijger RR.
Solitary, multifocal and generalized myofibromas: clinicopathological and immunohistochemical features of 114 cases.
Histopathology. 2012; 60(6B): E1-11.
AIMS: To report a large series of solitary and multiple myofibromas with systematic clinicopathological correlations. METHODS AND RESULTS: We report on 114 patients with myofibromas, 97 of which were solitary and 17 multifocal. The age at presentation ranged from newborn to 70 years. All multifocal myofibromas and 91% of solitary myofibromas occurred in children. The head and neck region was the most common site (n = 43), followed by the trunk (n = 24), lower limbs (n = 14), upper limbs (n = 11), and viscera (n = 4). Solitary and multifocal myofibromas stained positively for smooth muscle actin (SMA) in 95% and 92% of cases, muscle-specific actin (MSA) in 75% and 50% of cases, and desmin in 10% and 14% of cases, respectively. Regressive features were seen in 34 solitary myofibromas and in nine multifocal myofibromas. Most patients were treated
with complete excision (n = 79) or partial excision (n = 12). There were no recurrences after treatment. CONCLUSIONS: Solitary and multiple myofibromas are benign tumours that predominantly occur in infancy and childhood. Myofibromas occur especially in the head and neck region, and are characterized by SMA and, to a lesser extent, MSA expression. The clinical course is self-limiting, and local excision appears to be sufficient.

Palmer DJ and Prescott SL.
Does early feeding promote development of oral tolerance?
The prevalence of food allergy has continued to rise over the last 10-15 years, with building concern over the underlying causes and the best strategies to reverse this. Although it is still not clear if infant feeding practices play any significant role in either the aetiology of this epidemic or in its prevention, these have nonetheless been core to many previous prevention strategies. Early 'allergen avoidance' strategies have not only failed, but have instead been increasingly associated with increased risk of allergic disease. Together with other observations in humans and animals, this suggests that earlier introduction of allergenic foods may be a more logical preventive strategy. Based on this, there are several randomised controlled trials world-wide assessing the merits of early introduction of complementary feeding and/or allergenic foods. Until the results of these studies are available it is difficult to provide definitive recommendations regarding the role of early feeding in the induction of oral tolerance and prevention of food allergy.

Palmer DJ, Sullivan T, Gold MS, Prescott SL, Heddle R, Gibson RA and Makrides M.
Effect of n-3 long chain polyunsaturated fatty acid supplementation in pregnancy on infants' allergies in first year of life: randomised controlled trial.
BMJ. 2012; 344: e184.
OBJECTIVE: To determine whether dietary n-3 long chain polyunsaturated fatty acid (LCPUFA) supplementation of pregnant women with a fetus at high risk of allergic disease reduces immunoglobulin E associated eczema or food allergy at 1 year of age. DESIGN: Follow-up of infants at high hereditary risk of allergic disease in the Docosahexaenoic Acid to Optimise Mother Infant Outcome (DOMInO) randomised controlled trial. SETTING: Adelaide, South Australia. PARTICIPANTS: 706 infants at high hereditary risk of developing allergic disease whose mothers were participating in the DOMInO trial. INTERVENTIONS: The intervention group (n=368) was randomly allocated to receive fish oil capsules (providing 900 mg of n-3 LCPUFA daily) from 21 weeks' gestation until birth; the control group (n=338) received matched vegetable oil capsules without n-3 LCPUFA. MAIN OUTCOME MEASURES: Immunoglobulin E associated allergic disease (eczema or food allergy with sensitisation) at 1 year of age. RESULTS: No differences were seen in the overall percentage of infants with immunoglobulin E associated allergic disease between the n-3 LCPUFA and control groups (32/368 (9%) v 43/338 (13%); unadjusted relative risk 0.68, 95% confidence interval 0.43 to 1.05, P=0.08; adjusted relative risk 0.70, 0.45 to 1.09, P=0.12), although the percentage of infants diagnosed as having atopic eczema (that is, eczema with associated sensitisation) was lower in the n-3 LCPUFA group (26/368 (7%) v 39/338 (12%); unadjusted relative risk 0.61, 0.38 to 0.98, P=0.04; adjusted relative risk 0.64, 0.40 to 1.02, P=0.06). Fewer infants were sensitised to egg in the n-3 LCPUFA group (24/368 (6.5%) v 32/338 (9.5%); unadjusted relative risk 0.61, 0.40 to 0.91, P=0.02; adjusted relative risk 0.62, 0.41 to 0.93, P=0.02), but no difference between groups in immunoglobulin E associated food allergy was seen. CONCLUSION: n-3 LCPUFA supplementation in pregnancy did not reduce the overall incidence of immunoglobulin E associated allergies in the first year of life, although atopic eczema and egg sensitisation were lower. Longer term follow-up is needed to determine if supplementation has an effect on respiratory allergic diseases and aeroallergen sensitisation in childhood. TRIAL REGISTRATION: Australian New Zealand Clinical Trials Registry ACTRN12610000735055 (DOMInO trial: ACTRN12605000569606).

International consensus on (ICON) pediatric asthma.
Asthma is the most common chronic lower respiratory disease in childhood throughout the world. Several guidelines and/or consensus documents are available to support medical decisions on pediatric asthma. Although there is no doubt that the use of common systematic approaches for management can considerably improve outcomes, dissemination and implementation of these are still major challenges. Consequently, the
International Collaboration in Asthma, Allergy and Immunology (iCAALL), recently formed by the EAACI, AAAAI, ACAAI, and WAO, has decided to propose an International Consensus on (ICON) Pediatric Asthma. The purpose of this document is to highlight the key messages that are common to many of the existing guidelines, while critically reviewing and commenting on any differences, thus providing a concise reference. The principles of pediatric asthma management are generally accepted. Overall, the treatment goal is disease control. To achieve this, patients and their parents should be educated to optimally manage the disease, in collaboration with healthcare professionals. Identification and avoidance of triggers is also of significant importance. Assessment and monitoring should be performed regularly to re-evaluate and fine-tune treatment. Pharmacotherapy is the cornerstone of treatment. The optimal use of medication can, in most cases, help patients control symptoms and reduce the risk for future morbidity. The management of exacerbations is a major consideration, independent of chronic treatment. There is a trend toward considering phenotype-specific treatment choices; however, this goal has not yet been achieved.

Patole S and Rao SC
Children surviving intrauterine and neonatal insults have a significant risk of long-term adverse neurodevelopmental outcomes.
Evidence Based Medicine. 2012.
Children who survive intrauterine and neonatal insults are known to be at risk for long-term adverse neurodevelopmental outcomes. However, the extent to which this occurs, especially in resource-poor nations, is not well documented. The systematic review by Mwaniki et al focuses on this important issue.

Payne D
A paper that changed my practice: The question cube.

Payne D and Kennedy A.

Payne D, Kennedy A, Kretzer V, Turner E, Shannon P and Viner R.
Developing and running an adolescent inpatient ward.
Advocates of adolescent health have long argued for the development of dedicated inpatient units. In the UK, many recently built children's hospitals have included adolescent wards, with further wards actively planned for new builds. In Australia, adolescent wards have been established in all but one of the major children's hospitals and will be a feature of all three new children's hospitals currently being built (in Melbourne, Brisbane and Perth). Despite growing interest in the development of adolescent inpatient facilities, and evidence that they improve quality, there is little in the recent literature to guide those tasked with setting up or running such units. Those who currently operate such wards thus have the regular task of fielding enquiries from colleagues about developing and operating hospital-based services for young people. The aim of this article is therefore to describe our experiences of developing and working on adolescent wards in Australia and the UK, focusing on the ward design, case-mix, staffing requirements and ward philosophy and discussing the benefits and potential disadvantages of a dedicated adolescent ward.

Childhood muscle morphology and strength: alterations over six months of growth.
INTRODUCTION: The purpose of this study was to establish the nature and stability of the strength-size relationship for the knee flexors and extensors across a 6-month period of childhood growth. METHODS: Nineteen typically developing children aged 5-11 years underwent lower limb magnetic resonance imaging (MRI) and dynamometry strength assessments on 2 occasions, 6 months apart. Muscle volume (MV) and maximum anatomical cross-sectional area (aCSA) for the knee flexors and extensors were determined using MRI analysis software. Isokinetic dynamometry determined corresponding isometric and isokinetic strength. RESULTS: Strong correlations were found between muscle size and strength for both the knee flexors and extensors (r = 0.84-0.90; P < 0.01). Furthermore, the ratio of strength to muscle size remained consistent across 6 months of prepubescent growth. CONCLUSIONS: Increases in thigh muscle strength were relative to those in muscle size, suggesting that muscle growth may play an important role in the development of strength during childhood.

Cord blood transplantation in Western Australia.
Quanjer PH, Hall GL, Stanojevic S, Cole TJ and Stocks J.

Age-and height-based prediction bias in spirometry reference equations.


Multi-ethnic reference values for spirometry for the 3-95 year age range: the global lung function 2012 equations.
European Respiratory Journal. 2012; [Epub ahead of print].

Derive continuous prediction equations and their lower limits of normal for spirometric indices, which are applicable globally. Over 160,000 data points from 72 centres in 33 countries were shared with the European Respiratory Society Global Lung Function Initiative. Eliminating data that could not be used (mostly missing ethnic group, some outliers) left 97,759 records of healthy nonsmokers (55.3% females) aged 2.5–95 years. Lung function data were collated, and prediction equations derived using the LMS (λ, μ, σ) method, which allows simultaneous modelling of the mean (μ), the coefficient of variation (σ) and skewness (λ) of a distribution family. After discarding 23,572 records, mostly because they could not be combined with other ethnic or geographic groups, reference equations were derived for healthy individuals from 3–95 years for Caucasians (N=57,395), African Americans (N=3,545), and North (N=4,992) and South East Asians (N=8,255). FEV1 and FVC between ethnic groups differed proportionally from that in Caucasians, such that FEV1/FVC remained virtually independent of ethnic group. For individuals not represented by these four groups, or of mixed ethnic origins, a composite equation is taken as the average of the above equations is provided to facilitate interpretation until a more appropriate solution is developed. Spirometric prediction equations for the 3–95 age range are now available that include appropriate age-dependent lower limits of normal. They can be applied globally to different ethnic groups. Additional data from the Indian subcontinent, Arab, Polynesian, Latin American countries, and Africa will further improve these equations in the future.

Rakshasbhuvankar A, Rao S, Minutillo C, Gollow I and Kolar S.

Peritoneal drainage versus laparotomy for perforated necrotising enterocolitis or spontaneous intestinal perforation: a retrospective cohort study.

AIM: Perforated necrotising enterocolitis (NEC) and spontaneous intestinal perforation (SIP) in preterm infants are associated with high morbidity and mortality. The optimum surgical management during the acute stage remains unclear. The aim of the study was to compare the outcomes of preterm infants (gestational age at birth <30 weeks) with perforated NEC or SIP undergoing primary peritoneal drainage (PD) versus laparotomy. METHODS: This was a retrospective cohort study (January 2004 to February 2010). Initial search of hospital database followed by a review of the medical records was performed to identify eligible infants. Thirty-nine infants were included in the study. Information regarding the baseline characteristics and outcomes of interest were recorded using the medical charts, radiology and laboratory databases. NEC was differentiated from SIP based on radiological, operative and clinical findings retrospectively for this study. RESULTS: Among 39 infants, 19 underwent primary PD while 20 had primary laparotomy. Gestational age and birthweight were similar between the two groups. The composite outcome of mortality before discharge or hospital stay longer than 3 months post-term was significantly worse in PD group (74% vs. 40%, P= 0.038). CONCLUSIONS: Preterm infants undergoing PD for NEC/SIP appeared to have increased risk of adverse outcome compared with laparotomy. More randomised controlled trials are necessary to confirm these findings.

Ramasamy A, Kuokkanen M, Vedantam S, Gajdos ZK, Alves AC, Lyon HN, Ferreira MAR, Strachan DP, Zhao JH and Abramson MJ.

Genome-Wide Association Studies of Asthma in Population-Based Cohorts Confirm Known and Suggested Loci and Identify an Additional Association near HLA.

Rao S and Simmer K.

World Health Organization growth charts for monitoring the growth of Australian children: time to begin the debate.

The recently released World Health Organization growth charts are methodologically robust, as well as clinically useful tools for monitoring the growth of children. They have been endorsed by premier organisations such as the Royal College of Paediatrics and Child Health (UK), Canadian Pediatric Society, Australian Breastfeeding Association, United Nations Standing Committee on Nutrition, International Union of Nutrition Sciences,
Delivering a Healthy WA

International Pediatric Association and the European Childhood Obesity Group. The Centers for Disease Control and Prevention (CDC) as well as the American Academy of Pediatrics have also recently endorsed these charts for the 0- to 24-month age group in USA. These growth charts have been adopted by many countries including Canada, UK and New Zealand. Nearly 140 countries are at various stages of implementing them. They offer significant advantages over the currently used CDC 2000 growth charts. They have the potential to contribute in reducing the worldwide incidence of obesity as well as under nutrition in children. Except Northern Territory, Australia continues to use the CDC 2000 growth charts. Paediatricians need to initiate and lead robust debate involving key stakeholders about the implementation of World Health Organization growth charts for monitoring the growth of Australian infants and children.


Reynolds V, Buckland A, Bailey J, Lipscombe J, Nathan E, Vijayasekaran S, Kelly R, Maryn Y and French N. Objective assessment of pediatric voice disorders with the acoustic voice quality index. J Voice. 2012; 26(5): e671-677. OBJECTIVES/HYPOTHESIS: Instrumental measures of voice allow practitioners to assess the severity of voice disorders and objectively measure treatment outcomes. Instrumental measures should be calculated on both sustained vowel and connected speech samples to ensure ecological validity. However, there is a lack of appropriate, validated acoustic measurements for use in the pediatric population. The Acoustic Voice Quality Index (AVQI) is a multivariate acoustic measure of dysphonia that has been found to be reliable, valid, and have diagnostic accuracy and response to change in an adult population. This study aimed to evaluate the AVQI in a pediatric population. STUDY DESIGN: This was a prospective observational study of a sample of dysphonic and normophonic children. METHODS: Sixty-seven preterm participants (born at less than 25 weeks gestation) aged between 6 and 15 years were recruited. Participants were excluded because of either inability to comply with task requirements or other speech-related factors that affected acoustic measurement. Forty normophonic term-born participants aged between 5 and 15 years were also recruited. AVQI analysis was conducted on a prolonged vowel sample and a sample of continuous speech. RESULTS: The AVQI was found to have diagnostic accuracy and specificity in this population of children with and without dysphonia. It was moderately correlated with ratings of severity on the GRBAS (overall grade of hoarseness (G), roughness (R), breathiness (B), aesthenicity (A), and strain (S)), a subjective rating scale. The threshold for pathology of this sample of 3.46 showed strong sensitivity, specificity, and accuracy, with good-to-excellent likelihood ratios. CONCLUSIONS: This study found that the AVQI has diagnostic accuracy in a pediatric population, suggesting that it is an appropriate assessment tool to determine the presence and severity of pediatric voice disorders.

Richmond PC, Marshall HS, Nissen MD, Jiang Q, Jansen KU, Garces-Sanchez M, Martinon-Torres F, Beeslaar J, Szenborn L, Wysocki J, Eiden J, Harris SL, Jones TR, Perez JL and Study I. Safety, immunogenicity, and tolerability of meningococcal serogroup B bivalent recombinant lipoprotein 2086 vaccine in healthy adolescents: a randomised, single-blind, placebo-controlled, phase 2 trial. Lancet Infect Dis. 2012; 12(8): 597-607. BACKGROUND: Neisseria meningitidis serogroup B is a major cause of invasive meningococcal disease, but a broadly protective vaccine is not currently licensed. A bivalent recombinant factor H-binding protein vaccine (recombinant lipoprotein 2086) has been developed to provide broad coverage against diverse invasive meningococcus serogroup B strains. Our aim was to test the immune response of this vaccine. METHODS: This randomised, placebo-controlled trial enrolled healthy adolescents from 25 sites in Australia, Poland, and Spain. Exclusion criteria were previous invasive meningococcal disease or serogroup B vaccination, previous adverse reaction or known hypersensitivity to the vaccine, any significant comorbidities, and immunosuppressive therapy or receipt of blood products in the past 6 months. Participants were randomly assigned with a computerised block randomisation scheme to receive ascending doses of vaccine (60, 120, or 200 mug) or placebo at 0, 2, and 6 months. Principal investigators, participants and their guardians, and laboratory personnel were masked to the allocation; dispensing staff were not. Immunogenicity was measured by serum bactericidal assays using human complement (hSBA) against eight diverse meningococcus serogroup B strains. The co-primary endpoints were seroconversion for the two indicator strains (PMB1745 and PMB17) analysed by the Clopper-Pearson method. Local and systemic reactions and adverse events were recorded. The study is registered at ClinicalTrials.gov, number NCT00808028. FINDINGS: 539 participants were enrolled and 511 received all three study vaccinations--116 in the placebo group, 21 in the 60 mug group, 191 in the 120 mug group, and 183 in the 200 mug group. The proportion of participants responding with an hSBA titre equal to or greater than the lower limit of quantitation of the hSBA assays (reciprocals of 7 to 18, depending on
test strain) was similar for the two largest doses and ranged from 75.6 to 100.0% for the 120 mug dose and 67.9 to 99.0% for the 200 mug dose. Seroconversion for the PMB1745 reference strain was 17 of 19 (89.5%) participants for the 60 mug dose, 103 of 111 (92.8%) participants for the 120 mug dose, 94 of 100 (94.0%) participants for the 200 mug dose, and four of 73 (5.5%) participants for placebo. For the PMB17 reference strain seroconversion was 17 of 21 (81.0%) participants for the 60 mug dose, 97 of 112 (86.6%) participants for the 120 mug dose, 89 of 105 (84.8%) participants for the 200 mug dose, and one of 79 (1.3%) participants for placebo. The hSBA response was robust as shown by the high proportion of responders at hSBA titres up to 16. Mild-to-moderate injection site pain was the most common local reaction (50 occurrences with the 60 mug dose, 437 with the 120 mug dose, 464 with the 200 mug dose, and 54 with placebo). Systemic events, including fatigue and headache, were generally mild to moderate. Overall, adverse events were reported by 18 participants (81.8%) in the 60 mug group, 77 (38.9%) in the 120 mug group, 92 (47.2%) in the 200 mug group, and 54 (44.8%) in the placebo group. Fieberns were rare and generally mild (one in the 60 mug group, 24 in the 120 mug group, 35 in the 200 mug group, and five in the placebo group; range, 0-6.3% after each dose). Incidence and severity of fever did not increase with subsequent vaccine dose within groups. One related serious adverse event that resolved without sequelae occurred after the third dose (200 mug).

FUNDING: Wyeth, Pfizer.

Richmond PC, Nissen MD, Marshall HS, Lambert SB, Robertson D, Gruber WC, Jones TR and Arora A. A bivalent Neisseria meningitidis recombinant lipidated factor H binding protein vaccine in young adults: results of a randomised, controlled, dose-escalation phase 1 trial. Vaccine. 2012; 30(43): 6163-6174. Neisseria meningitidis is a leading cause of meningitis and septicaemia, but a broadly-protective vaccine against endemic serogroup B disease is not licensed and available. The conserved, outer-membrane lipoprotein factor H binding protein (fHBP, also known as LP2086) is expressed as one of two subfamily variants in virtually all meningococi. This study investigated the safety, tolerability, and immunogenicity of a recombinant-expressed bivalent fHBP (r-fHBP) vaccine in healthy adults. Participants (N=103) aged 18-25 years were recruited into three ascending dose level cohorts of 20, 60, and 200mcg of a bivalent r-fHBP vaccine formulation and randomised to receive vaccine or placebo at 0, 1, and 6 months. The vaccine was well tolerated. Geometric mean titres (GMTs) for r-fHBP subfamily-specific IgG antibodies increased 19168-fold from pre-vaccination to post-dose 2 in a dose level-dependent manner. In addition, robust serum bactericidal assay using human complement (hSBA) responses for strains expressing both homologous and heterologous fHBP variants were observed. After three vaccinations, 16-52% of the placebo group and 47-90%, 75-100%, and 88-100%, of the 20, 60, and 200mcg dose levels, respectively, had seroprotective (>1:4) hSBA titres against six serogroup B strains. The bivalent r-fHBP vaccine was well tolerated and induced robust bactericidal activity against six diverse serogroup B strains in young adults at the 60 and 200mcg dose levels.

Riedl S, Hughes I, Harris GM, Bellby J, Sly P and Choong CS. GH secretagogue receptor gene polymorphisms are associated with stature throughout childhood. European Journal of Endocrinology. 2012; 166(6): 1079-1085. Context Ghrelin plays a major role in GH physiology and energy metabolism. Polymorphisms of its receptor (GH secretagogue receptor (GHSR)) may influence childhood growth and weight regulation. Objective To correlate GHSR polymorphisms with auxological parameters throughout childhood in a healthy cohort. Study design Longitudinal retrospective population-based genetic association study. Subjects and methods GHSR genotypes were evaluated in 1362 children and compared with height/length, weight, and body mass index (BMI) data across an observation span of 10 years (0, 1, 3, 5, 8, and 10 years). Five different GHSR SNPs (rs2922126, rs2981464, rs4822040, rs562416, and rs572169), minor allele frequency >0.1, were genotyped. Identification of potential genetic associations with height, weight, and BMI, using additive and dominant/recessive models, was optimized by comparing allele or genotype frequencies between the tallest and the shortest 27% of subjects for each auxological variable. Significance of association was evaluated by $\chi^2$ test. Results The rs482204 TT genotype, vs TC/CC, was associated with greater stature across the entire observation period (P<0.05). Similarly, the rs562416 TT genotype, vs TG/GG, correlated positively with tall stature at 3, 8, and 10 years. Other SNPs and genotypes showed no association with height at any age. No association was found between any tested SNPs and weight or BMI. Conclusions Longitudinal investigation between birth and 10 years in a population-based cohort revealed a significant association of the rs482204 and rs562416 GHSR polymorphisms on height, whereas no association between GHSR polymorphisms and weight or BMI was ascertainable.

Rowlands R, Geelhoed G and Stannage K.
Putting evidence based protocols into practice- a paediatric buckle fracture pathway.
Archives of Disease in Childhood. 2012; 97(Suppl 1): A141-A142.
Background and aims Distal forearm fractures are a common injury of childhood. They are traditionally treated in a plaster of Paris back slab (POP) and referred for orthopaedic follow up. Evidence shows these fractures may be treated in removable splints without follow up. A pathway for splinting such fractures with removable fabric and metal splints was introduced in our department. Aims were to reduce return trips to hospital for follow up decreasing disruption to families, free up medical and nursing time and ultimately produce an economic benefit to the hospital. Methods A control group of patients treated in a POP was identified. Detailed notes review showed those eligible for a removable splint, number of x-rays performed and follow up visits. The average time taken to apply a POP was determined. A previously implemented pathway and information leaflet were modified for local use and staff educated about the change. A “safety net” of x-ray review by a consultant Orthopaedic surgeon was put in place for all patients placed in a removable splint. Study data was captured from the Electronic Emergency Department Information System (EDIS) (figure 1). Pathway. Results Over 15 weeks there were 348 forearm fractures of which 37% were buckle fractures. No child placed in a removable splint required a change in treatment plan after orthopaedic “safety net” review (figure 2). Flow diagram of forearm fractures. There was a statistically significant reduction in the time from doctor review until discharge of approximately 20 minutes (p=0.001). There has been a reduction of 50% in the number of x-rays and decrease from 4 to 1 in the median number of hospital visits (figure 3). Graph of x-rays and OPN attendances. The changes equate to a money and time cost saving for the family and hospital that is yet to be fully quantified. In our department the change would equate to a reduction of 600 patients or 1500 attendances per year in fracture clinic. Conclusions This pathway shows how a simple evidence based pathway can improve the patient journey, reduce healthcare expenditure and release time to care.

Rueter K, Bizzintino J, Martin AC, Zhang G, Hayden CM, Geelhoed GC, Goldblatt J, Laing IA and Le Souef PN.
Symptomatic Viral Infection is Associated with Impaired Response to Treatment in Children with Acute Asthma.
OBJECTIVE: To examine the influence of viral respiratory infection (VRI) on treatment response in acute asthma in children. STUDY DESIGN: A total of 218 children (mean age, 6.6 years) with acute asthma were recruited. Symptoms were recorded, an asthma severity score was determined, and whenever possible, a per-nasal aspirate was obtained for detection of viruses. Each child's response to inhaled beta(2)-agonists was assessed after 6, 12, and 24 hours. RESULTS: The 168 children with VRI symptoms received more treatment with inhaled beta(2)-agonists after 6 hours (P = .010), 12 hours (P = .002), and 24 hours (P = .005) compared with the 50 children without such symptoms. Asthma severity did not differ between the 2 groups. A per-nasal aspirate was obtained from 77% of the children. The most frequently identified virus was rhinovirus (61.4%). Among children with symptoms of a VRI, those with rhinovirus had an impaired response to beta(2)-agonists at 6 hours (P = .032). CONCLUSION: Children with acute asthma and symptoms of VRI respond less effectively to beta(2)-agonists after 6, 12, or 24 hours and thus may benefit from more intense therapy and monitoring.

The effect of a 12-month multidisciplinary lifestyle education programme on BMI-z score and cardio-metabolic outcomes.

Russell L, Sorensen E, Curran J, Norfolk J, Davis E and Bell L.
The role of child protection services in childhood obesity.

Rye MS, Warrington NM, Scaman ESH, Vijayasekaran S, Coates HL, Anderson D, Pennell CE, Blackwell JM and Jamieson SE.
Genome-Wide Association Study to Identify the Genetic Determinants of Otitis Media Susceptibility in Childhood.

Schultz A and Brand PL.
Phenotype-directed treatment of pre-school-aged children with recurrent wheeze.
Wheeze in childhood may comprise different underlying diseases. Disease-specific treatment could potentially improve treatment efficacy. Various attempts have been made to differentiate between pre-school wheeze phenotypes. In this review, the results of clinical trials evaluating treatment of pre-school wheeze are discussed, with specific emphasis on the characteristics and phenotype of the study populations. Evidence suggests that systemic corticosteroids are not beneficial for the treatment of mild-to-moderate exacerbations of pre-school wheeze, irrespective of phenotype. The use of high-dose intermittent inhaled corticosteroid treatment cannot be recommended because of unacceptable side effects. Treatment with regular inhaled corticosteroids and leukotriene antagonists offer modest benefit, but neither treatment reduces hospitalisation rates. There is currently some evidence for a phenotype-specific effect of treatment. Phenotype-directed treatment of pre-school wheeze is currently limited by our ability to accurately differentiate between clinically useful phenotypes.

**Schultz A, Sly PD, Zhang G, Venter A, Devadason SG and Le Souef PN.**
Usefulness of parental response to questions about adherence to prescribed inhaled corticosteroids in young children.
BACKGROUND: Adherence to prescribed inhaled medication is often low in young children. Poor adherence to medication may contribute to lack of symptom control. Doctors are not good at predicting the adherence rates of their patients, and parental report of adherence does not correlate with objective measures of adherence. The objective of this study was to investigate whether parental admission of non-adherence and reasons given for non-adherence correlated with objectively measured adherence. METHODS: Adherence to prescribed inhaled corticosteroid treatment was monitored electronically in 132 children aged 2-6 years who were participating in a randomised controlled trial comparing different inhaler devices. Follow-up was carried out every 3 months for a year. Parental answers to simple questions about adherence were compared to electronically measured adherence. RESULTS: Mean adherence ranged from zero to 100%. Intra-participant adherence varied throughout the year-long study period (mean variance for individual children between quarterly periods was 28.5%). Parents who reported missed doses, generally missed at least half of the prescribed doses. Parents who reported that not a single prescribed dose was missed, still missed 20% of doses on average. Adherence was particularly low when parents cited initiating their own trial off medication as a reason for missing doses. CONCLUSIONS: By examining parental response to questions enquiring whether any doses were missed, healthcare providers can gain a modest degree of insight into their patients’ true adherence to prescribed medication. Adherence to prescribed asthma medication is extremely variable in young children. TRIAL REGISTRATION NUMBER: Data from this study were derived from a randomised controlled trial (ACTRN12608000294358).

**Schultz A, Sly PD, Zhang G, Venter A, Le Souef PN and Devadason SG.**
Incentive device improves spacer technique but not clinical outcome in preschool children with asthma.
Aim: To investigate the influence of an incentive device, the Funhaler, on spacer technique and symptom control in young children with asthma and recurrent wheeze. Methods: Randomised controlled trial where 132 2-6 year old asthmatic children received regular inhaled fluticasone through Aerochamber Plus, or Funhaler. The setting was a research clinic at Princess Margaret Hospital for Children, Perth, Australia. Subjects were followed up for a year. The main outcome measure was asthma symptoms. Proficiency in spacer technique was measured as salbutamol inhaled from spacer onto filter. Quality of life was measured every three months. Groups were compared in terms of spacer technique, symptoms and quality of life. The relationship between spacer technique and clinical outcome was examined. Results: There was no difference between Funhaler and Aerochamber groups in wheeze free days, cough free days, bronchodilator free days or quality of life (P = 0.90, 0.87, 0.74 and 0.11 respectively). Spacer technique was better in the Funhaler group (P = 0.05), particularly in subjects younger than 4 years of age (P = 0.002). Drug dose on filter (as the mean of five 100 mg doses) ranged from zero to 136 mg. Conclusions: Use of Funhaler incentive device does not improve clinical outcome, but improves spacer technique in children younger than 4 years. Variability in drug delivery is large in young children using pressurised metered dose inhalers and spacers.

**Shetty VB, Bower C, Jones TW, Lewis BD and Davis EA.**
Ethnic and gender differences in rates of congenital adrenal hyperplasia in Western Australia over a 21 year period.
Aim: To evaluate the incidence, sex distribution, ethnicity, age at diagnosis, clinical presentation and morbidity of all childhood-onset congenital adrenal hyperplasia (CAH) cases in Western Australia (WA) between 1990 and 2010, a state where newborn screening for CAH is not in place. Methods: The total number of all known CAH cases was identified. Case files were reviewed retrospectively to determine clinical details. Classical CAH (C-CAH) was defined as patients presenting before 6 months of age and non-classical (NC-CAH) as presenting...
After 6 months. Results: Of the 41 CAH cases (26 female) born in WA, 5 (12.2%) were of Aboriginal ethnicity. CAH was due to 21-hydroxylase deficiency in 40 cases. Of those with 21-hydroxylase deficiency, 37 were C-CAH (25 female) and 3 NC-CAH (all male). The incidence of C-CAH in WA was estimated to be 0.67 per 10,000 live births (1:14,869). The incidence rate of Aboriginal compared with non-Aboriginal C-CAH was 2.45 (95% confidence interval 0.96-6.29). The mean age of diagnosis of C-CAH cases was lower in females (8.9 +/- 2.5 days) compared to males (23.4 +/- 9.8 days). Among these males, 72.7% presented initially with adrenal crisis. Conclusion: The estimated incidence of classical CAH is similar to composite worldwide data. The increased female-to-male ratio is not in keeping with the expected sex distribution seen in a recessively inherited disease. The delayed diagnosis in males, with a significant proportion presenting with adrenal crisis, could be avoided with newborn screening. The higher rate of CAH in patients with Aboriginal ethnicity is a novel observation.

Shields L, Zhou H, Taylor M, Hunter J, Munns A and R W.


Objectives: The objective of this review was to identify the effectiveness of family-centred models of care for children (excluding premature neonates) when compared to standard models of care.


Background: This is an update of the Cochrane systematic review of family-centred care published in 2007 (Shields 2007). Family-centred care (FCC) is a widely used model in paediatrics, is thought to be the best way to provide care to children in hospital and is ubiquitous as a way of delivering care. When a child is admitted, the whole family is affected. In giving care, nurses, doctors and others must consider the impact of the child's admission on all family members. However, the effectiveness of family-centred care as a model of care has not been measured systematically. Objectives: To assess the effects of family-centred models of care for hospitalised children aged from birth (unlike the previous version of the review, this update excludes premature neonates) to 12 years, when compared to standard models of care, on child, family and health service outcomes. Search methods: In the original review, we searched up until 2004. For this update, we searched: the Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library, Issue 12 2011); MEDLINE (Ovid SP); EMBASE (Ovid SP); PsycINFO (Ovid SP); CINAHL (EBSCO Host); and Sociological Abstracts (CSA). We did not search three that were included in the original review: Social Work Abstracts, the Australian Medical Index and ERIC. We searched EMBASE in this update only and searched from 2004 onwards. There was no limitation by language. We performed literature searches in May and June 2009 and updated them again in December 2011. Selection criteria: We searched for randomised controlled trials (RCTs) including cluster randomised trials in which family-centred care models are compared with standard models of care for hospitalised children (0 to 12 years, but excluding premature neonates). Studies had to meet criteria for family-centredness. In order to assess the degree of family-centredness, we used a modified rating scale based on a validated instrument, the same instrument used in the initial review, however, we decreased the family-centredness score for inclusion from 80% to 50% in this update. We also changed several other selection criteria in this update: eligible study designs are now limited to randomised controlled trials (RCTs) only; single interventions not reflecting a FCC model of care have been excluded; and the selection criterion whereby studies with inadequate or unclear blinding of outcome assessment were excluded from the review has been removed. Data collection and analysis: Two review authors undertook searches, and four authors independently assessed studies against the review criteria, while two were assigned to extract data. We contacted study authors for additional information. Main results: Six studies found since 2004 were originally viewed as possible inclusions, but when the family-centred score assessment was tested, only one met the minimum score of family-centredness and was included in this review. This was an unpublished RCT involving 288 children post-tonsillectomy in a care-by-parent unit (CBPU) compared with standard inpatient care. The study used a range of behavioural, economic and physical measures. It showed that children in the CBPU were significantly less likely to receive inadequate care compared with standard inpatient admission, and there were no significant differences for their behavioural outcomes or other physical outcomes. Parents were significantly more satisfied with CBPU care than standard care, assessed both before discharge and at 7 days after discharge. Costs were lower for CBPU care compared with standard inpatient care. No other outcomes were reported. The study was rated as being at low to unclear risk of bias. Authors' conclusions: This update of a review has found limited, moderate-quality evidence that suggests some benefit of a family-centred care intervention for children's clinical care, parental satisfaction, and costs, but this is based on a small dataset and needs confirmation in larger RCTs. There is no evidence of harms. Overall, there continues to be little high-quality quantitative research available about the effects of family-centred care. Further rigorous research on the use of family-centred care as a
model for care delivery to children and families in hospitals is needed. This research should implement well-developed family-centred care interventions, ideally in randomised trials. It should investigate diverse participant groups and clinical settings, and should assess a wide range of outcomes for children, parents, staff and health services.

Siafarikas A
Vitamin-D-Versorgung von Säuglingen, Kindern und Jugendlichen.

Siafarikas A, Johnston RJ, Bulsara MK, O'Leary P, Jones TW and Davis EA
Early loss of the glucagon response to hypoglycemia in adolescents with type 1 diabetes.
OBJECTIVE: To assess the glucagon response to hypoglycemia and identify influencing factors in patients with type 1 diabetes compared with non-diabetic control subjects. RESEARCH DESIGN AND METHODS: Hyperinsulinemic hypoglycemic clamp studies were performed in all participants. The glucagon response to both hypoglycemia and arginine was measured, as well as epinephrine, cortisol, and growth hormone responses to hypoglycemia. Residual beta-cell function was assessed using fasting and stimulated C-peptide.
RESULTS: Twenty-eight nonobese adolescents with type 1 diabetes (14 female, mean age 14.9 years [range 11.2–19.8]) and 12 healthy control subjects (6 female, 15.3 years [12.8–18.7]) participated in the study. Median duration of type 1 diabetes was 6.66 years (range 0.01–9.9). The glucagon peak to arginine stimulation was similar between groups (P = 0.27). In contrast, the glucagon peak to hypoglycemia was reduced in the group with diabetes (95% CI): 68 (62–74) vs. 96 (87–115) pg/mL (P < 0.001). This response was greater than 3 SDs from baseline for only 7% of subjects with type 1 diabetes in comparison with 83% of control subjects and was lost at a median duration of diabetes of 8 months and as early as 1 month after diagnosis (R = –0.41, P < 0.01). There was no correlation in response with height, weight, BMI, and HbA1c. Epinephrine, cortisol, and growth hormone responses to hypoglycemia were present in both groups. CONCLUSIONS: The glucagon response to hypoglycemia in adolescents with type 1 diabetes is influenced by the duration of diabetes and can be lost early in the course of the disease.

Simpson SJ, Straszek SP, Sly PD, Stick SM and Hall GL
Clinical investigation of respiratory system admittance in preschool children.
Introduction The upper airway shunt attenuates measurements of respiratory system impedance (Zrs), with greater impact in young children. Changes in respiratory system admittance, Ars (or Zrs–1), are theoretically independent of the shunt. This study compared the ability of Ars to standard oscillatory outcomes, to determine respiratory disease and differentiate responses to inhaled bronchial challenges in the clinical setting. Methods The forced oscillation technique (FOT) was used to establish reference equations for Ars in healthy preschool children, compare the change in Ars to standard oscillatory outcomes during bronchial challenge with inhaled adenosine-5′-monophosphate (AMP) and to inhaled bronchodilator in healthy children and those with respiratory disease. Results Children with respiratory disease had lower baseline Ars than healthy children (P<0.05). However, there was no improved ability for Ars to differentiate between bronchodilator responses in healthy and disease populations. In contrast, the response to inhaled AMP occurred at a lower concentration, [25 (3.12–400) mg·ml−1; median (10th–90th centile), as measured by Ars when compared to respiratory system resistance [225 (6.25–400) mg·ml−1; P=0.016]. Conclusion This study supports the use of Ars during inhaled challenges, but not in response to bronchodilation. Pediatr Pulmonol. Pediatr Pulmonol. 2012; 47:53–58. © 2010 Wiley Periodicals, Inc.

Sims C and von Ungern-Sternberg BS.
The normal and the challenging pediatric airway.
Management of a child's airway is one of the main sources of stress for anesthetists who do not routinely anesthetize children. Unfortunately, trainees are gaining less experience in pediatric airway management than in the past, which is particularly difficult at a time when some beliefs about airway management are being challenged and airway management is less standardized. Fortunately, most children have an easily managed, normal airway. Nevertheless, it is of vital importance to teach our trainees the basic airway skills that are probably the most important skill in an anesthetists' repertoire when it comes to a difficult airway situation. This review focuses on the airway management in children with a normal and a challenging airway. Different choices of airway management in children, and their advantages and disadvantages are discussed. Furthermore, the three broad causes of a challenging airway in children and infants are highlighted - the difficulty obtaining a
Delivering a Healthy WA

mask seal, difficulty visualizing the vocal cords, and the third cause in which the larynx can be visualized but the difficulty lies at or beyond that level. Guidelines are given how to deal with these patients as well as with the feared but rare scenario of ‘cannot ventilate, cannot intubate’ in children.


An 11-year-old patient with a history of oligodontia and hypohidrotic ectodermal dysplasia had implants placed in the anterior and posterior mandible as part of his prosthetic rehabilitation. The maxilla was restored by using traditional prosthetic methods. The long-term follow-up of the treatment is presented, and the clinical implications of placing implants in an actively growing child are discussed.


BACKGROUND: Little evidence exists to guide the management of the ‘Can’t Intubate, Can’t Oxygenate’ (CICO) scenario in pediatric anesthesia. OBJECTIVES: To compare two intravenous cannulae for ease of use, success rate and complication rate in needle tracheotomy in a postmortem animal model of the infant airway, and trial a commercially available device using the same model. METHODS: Two experienced proceduralists repeatedly attempted cannula tracheotomy in five postmortem rabbits, alternately using 18-gauge (18G) and 14-gauge (14G) BD Insyte® cannulae (BD, Franklin Lakes, NJ, USA). Attempts began at the first tracheal cartilage, with subsequent attempts progressively more caudal. Success was defined as intratracheal cannula placement. In each rabbit, an attempt was then made by each proceduralist to perform a cannula tracheotomy using the Quicktrach Child® device (VBM Medizintechnik GmbH, Sulz am Neckar, Germany). RESULTS: The rabbit tracheas were of similar dimensions to a human infant. 60 attempts were made at cannula tracheotomy, yielding a 60% success rate. There was no significant difference in success rate, ease of use, or complication rate between cannulae of different gauge. Successful aspiration was highly predictive (positive predictive value 97%) and both sensitive (89%) and specific (96%) for tracheal cannulation. The posterior tracheal wall was perforated in 42% of tracheal punctures. None of 13 attempts using the Quicktrach Child® were successful. CONCLUSION: Cannula tracheotomy in a model comparable to the infant airway is difficult and not without complication. Cannulae of 14- and 18-gauge appear to offer similar performance. Successful aspiration is the key predictor of appropriate cannula placement. The Quicktrach Child was not used successfully in this model. Further work is required to compare possible management strategies for the CICO scenario.


Background and objective: National surveillance of invasive pneumococcal disease (IPD) includes serotyping Streptococcus pneumoniae (SP) isolates from sterile site cultures. PCR is more sensitive and can identify more SP serotypes (STs) in culture-negative samples. The aim of this study was to determine whether enhanced surveillance of childhood empyema, using PCR, provides additional serotype information compared with conventional surveillance. Methods: Pleural fluid (PF) from children with empyema were cultured and tested by PCR to identify SP, targeting the autolysin gene (lytA). Multiplex PCR-based reverse line blot assay was used to identify SP STs. Corresponding IPD surveillance and serotype data were obtained from the National Notifiable Diseases Surveillance System (NNDSS). Results: Eighty-nine children with empyema, aged ≤16 years, were recruited between April 2008 and March 2009, inclusive. SP was isolated from 58/84 (5.9%) PF cultures and by PCR in 43/79 (54.4%) PF samples. Serotypes were unidentifiable in 15 samples. The frequency of six serotypes (or serotype pairs) identified in 28 samples, including one with two serotypes, were: ST1, n = 4/29 (13.8%); ST3, n = 9/29 (31.0%); ST19A, n = 12/29 (41.4%); ST7F/7A, n = 1/29 (3.4%); ST9V/9A, n = 1/29 (3.4%); ST22F/22A, n = 2/29 (6.9%). Over the same period, 361 IPD patients, aged 16 years or less, were notified to NNDSS. Among 331 serotypeable NNDSS isolates (71.5% from blood), the frequencies of ST1 and 3 were significantly lower than in PF samples: ST1, n = 8/331 (2.4%; P < 0.05); ST3, n = 13/331 (3.9%);
P < 0.0001). Conclusions: The use of PCR to identify and serotype SP in culture-negative specimens provides additive information.

Background: Histologic chorioamnionitis (HCA) is implicated in the onset of preterm labor and delivery. Chorioamnionitis is a known risk factor for early-onset sepsis and may modulate postnatal immunity. Preterm infants are at greatly increased risk of late-onset sepsis (LOS), particularly with coagulase-negative staphylococci (CoNS), but the impact of HCA on the risk of LOS is unknown. Methods: Eight hundred thirty-eight preterm infants born at <30 weeks gestational age at a single tertiary center were included. Histologic examination of placenta and extraplacental membranes was performed, and clinical data were extracted from hospital databases. The influence of HCA on the incidence of early-onset sepsis and LOS was examined using logistic regression analysis and Cox proportional hazards regression. Results: Mean gestational age was 28.9 ± 1.9 weeks, and mean birth weight was 936 ± 277 g. Two hundred and seventy-six (33%) of 838 infants developed LOS. The presence of fetal or maternal HCA, or maternal HCA and fetal HCA alone, was associated with a significantly decreased risk of LOS with any organism. Histologic chorioamnionitis correlated with a significantly decreased risk of CoNS LOS. Conclusions: HCA is associated with a significantly reduced risk of acquiring LOS, both with CoNS and other bacteria. Perinatal inflammation may enhance the functional maturation of the preterm immune system and provide protection against LOS in high-risk preterm infants.

Responsiveness of human monocytes to the commensal bacterium Staphylococcus epidermidis develops late in gestation.
Introduction:
Staphylococcus epidermidis (SE) rarely causes infection in term infants but is a leading cause of late-onset sepsis in preterm infants. We hypothesized that the innate immune responses to SE in preterm infants are impaired in a gestational age (GA)-dependent manner.

Strunk T, Simmer K and Burgner D.
Prematurity and Mortality in Childhood and Early Adulthood.

Taylor A, Lachlan K, Manners RM and Lotery AJ.
A study of a family with the skeletal muscle RYR1 mutation (c.7354C>T) associated with central core myopathy and malignant hyperthermia susceptibility.
Congenital myopathies are early onset hereditary muscle disorders. A sub-group of these is associated with malignant hyperthermia susceptibility. Mutations in the skeletal muscle ryanodine receptor (RYR1) gene have been associated with various congenital myopathy phenotypes and may also cause malignant hyperthermia susceptibility. We describe nine affected members of an extended family presenting with a myopathy typically manifesting as upper eye lid ptosis, quadriiceps atrophy and patellar dislocation. Three affected members underwent extensive genetic testing and have a RYR1 exon 46 c.7354C>T gene mutation; two of whom had muscle biopsies - both demonstrated central core myopathy. The only affected family member who underwent testing for malignant hyperthermia susceptibility was shown to be positive. The clinical phenotypes seen among affected family members varies widely in severity, and have features in common with those congenital myopathies associated with malignant hyperthermia susceptibility, raising the possibility that these conditions represent a spectrum of disease.

Thomas R, Lee S, Patole S and Rao S.
Antibiotic-impregnated catheters for the prevention of CSF shunt infections: a systematic review and meta-analysis.
CSF infections are a serious complication of CSF shunts and external ventricular drains (EVDs). Antibiotic-impregnated catheters (AIC) have been tried in order to minimise the risk of such infections. OBJECTIVES: To conduct a systematic review and a meta-analysis comparing AICs versus non-AICs used as ventriculoperitoneal (VP) shunts or external ventricular drains (EVDs) in the neonatal population. The secondary aim was to include data from a paediatric and adult population if insufficient information was available from neonatal studies. DATA SOURCES: PubMed (March 2011), EMBASE (March 2011), CENTRAL (1980-March 2011), and
CINAHL (March 2011) were searched. Study selection. Both randomised controlled trials (RCTs) and observational studies were included. RESULTS: Only three observational studies reported on the use of Al-VP shunt catheters in the neonatal population. Meta-analysis found a statistically significant difference favouring Al shunts (RR: 0.37; CI: 0.16, 0.86; p = 0.02). Twelve studies (one RCT, 11 observational; n = 3284) compared Al versus non-Al VP shunts in a paediatric and adult population. The RCT showed a trend towards benefit using the AlCs (RR: 0.38; 95% CI: 0.11, 1.30; p = 0.12). A meta-analysis of the 11 observational studies showed a significant benefit in the Al group (RR: 0.37; CI: 0.23, 0.60; p = 0.001; n = 3149). Similar benefits were noted for Al-EVDs in RCTs (RR: 0.19; 95% CI: 0.05, 0.64; p = 0.01; n = 472, two studies) and observational studies (RR: 0.31; 95 CI: 0.13, 0.74; p = 0.009: n = 2415, five studies). CONCLUSIONS: A meta-analysis of mainly observational studies suggests that AlCs may be an effective way of reducing the incidence of shunt and EVD infections. Well-designed multi-centre RCTs are urgently needed.


BACKGROUND: Characterization of regulatory immune pathways is a research priority for both the pathogenesis of allergic disease and potential therapeutic strategies. OBJECTIVE: The thymus is a rich source of regulatory T (Treg) cells, which offers a novel opportunity to document the maturation of these pathways beyond limited studies on small volumes of peripheral blood available from young children. METHODS: Thymus tissue was collected from children undergoing cardiac surgery (age, 1 week to 14 years), and skin prick testing was performed from 12 months of age. The ontogeny of Treg cell maturation and function was examined in atopic (n = 20) and nonatopic (n = 20) children by assessing their phenotype, enumeration, proliferation, and suppressive ability. RESULTS: Age-related changes in the thymic cytokine milieu paralleled the changes seen in peripheral immune function. Specifically, the thymic microenvironment is similarly T(H)2 skewed during the early postnatal period, and this undergoes age-related suppression as the T(H)1 (IFN-gamma) response increased. We detected CD4(+)CD25(+)CD127(lo/-)forkhead box protein 3 (FOXP3)-positive Treg cells in the neonatal thymus. These cells suppressed the proliferative response to allogeneic stimulation of CD4(+)+CD25(-) T cells dose dependently. In nonatopic children Treg cell turnover and suppressive function increased with age and paralleled the increase in global thymic FOXP3 mRNA expression, whereas in atopic children Treg cell maturation was significantly delayed compared with that seen in age-matched nonatopic children. CONCLUSION: These data suggest that the developmental changes in the thymus parallel the recognized changes in peripheral blood responses. There is also a developmental delay in the function of thymic regulatory cells in atopic compared with nonatopic children. These differences are fundamental to understanding early events that lead to immune dysregulation and might predispose to allergic disease.


Objective Secondary care could be the optimal sector for managing child and adolescent obesity, given low primary care uptake and limited tertiary services. We aimed to determine Australian paediatricians’ self-reported competence and training in managing obesity and, in a linked patient-level audit, whether these predict rates of measurement and obesity diagnosis. Design, setting and patients Australian Paediatric Research Network members completed an online survey, plus a prospective patient-level audit of up to 100 consecutive consultations over 2 weeks. Main outcome measures Survey: self-reported competencies, training in and use of clinical skills in obesity and its comorbidities. Audit: paediatricians reported each child’s height, weight, age, sex and diagnoses including overweight/obesity. Results Of 166 (44.7% response) paediatricians, most felt very/quite competent in assessing (89%) and managing (68%) obesity, but few in making a difference to obesity (20%) or managing hypertension (45%), insulin resistance (32%), fatty liver disease (22%) or dyslipidaemia (21%). The audit of 200 (66.2% response) paediatricians included 8345 patients. On average paediatricians recorded height and weight for 66.5% of patients (SD 30.0%, range 0–100%). Of the 296 (12.3%) patients obese by CDC cutpoints, 118 (39.9%) were diagnosed as obese; perceived competence increased the odds of recording this diagnosis but not measurement. Training levels were low, showed little association with
measurement or obesity diagnosis, and skills learnt were not routinely used. Conclusions There is a clear need for better paediatrician training in obesity management. However, care and outcomes for obese children are unlikely to improve unless effective management models can be operationalised systematically.


Objective: The objective of this systematic review was to establish what non-pharmacological practices are effective in managing fever in children, three months to 12 years of age, who are otherwise healthy.


Purpose Quality of life (QoL) is a ubiquitous yet poorly defined concept; the precise determinants of QoL are rarely identified. We used pilot data from the GapS Questionnaire to investigate the most important determinants of QoL in children with chronic somatic illness. Methods We enrolled 92 participants including 60 parents and 32 of their children. The sample comprised rheumatology, diabetes, epilepsy, gastroenterology, cystic fibrosis, and day unit patients. Trained interviewers administered the GapS Questionnaire to parents, and to children if ≥10 years. We determined the relative importance of different items for QoL. Results Child participants had a mean age of 14.7 years. Children identified “having good friendships”, “being happy most days”, and “getting along with parents” as most important. Parents ranked most highly “being allowed to do all the things you like doing”, “getting told you have done a good job at something”, and “being physically able to do everything you enjoy doing”. Conclusions Physical health items were not as important as social and psychological determinants of QoL in our pilot sample.


Background. It is uncertain whether particular clones causing invasive community-onset meticillin-resistant and meticillin-sensitive Staphylococcus aureus (cMRSA/cMSSA) infection differ in virulence. Methods. Invasive cMRSA and cMSSA cases were prospectively identified. Principal component analysis was used to derive an illness severity score (ISS) from clinical data, including 30-day mortality, requirement for intensive hospital support, the presence of bloodstream infection, and hospital length of stay. The mean ISS for each S. aureus clone (based on MLST) was compared with its DNA microarray-based genotype. Results. Fifty-seven cMRSA and 50 cMSSA infections were analyzed. Ten clones caused 82 (77%) of these infections and had an ISS calculated. The enterotoxin gene cluster (egc) and the collagen adhesin (cna) gene were found in 4 of the 5 highest-ranked clones (ST47-MSSA, ST30-MRSA-IV[2B], ST45-MSSA, and ST22-MRSA-IV[2B]) compared with none and 1 of the lowest 5 ranked clones, respectively. cMSSA clones caused more severe infection than cMRSA clones. The lukF/lukS Panton–Valentine leukocidin (PVL) genes did not directly correlate with the ISS, being present in the second, fourth, and 10th most virulent clones. Conclusions. The clinical severity of invasive cMRSA and cMSSA infection is likely to be attributable to the isolates’ entire genotype rather than a single putative virulence determinant such as PVL.


Antioxidant intakes in pregnancy may influence fetal immune programming and the risk of allergic disease. We investigated associations between maternal intakes of beta-carotene, vitamin C, vitamin E, copper and zinc, and infant allergic outcomes. Antioxidant intakes of pregnant women (n = 420) assessed prospectively by a food frequency questionnaire, were examined in relation to allergic outcomes at 1 year of age (n = 300). The main relationships with allergic outcomes were seen with dietary vitamin C and copper. Specifically, higher maternal dietary vitamin C intake was associated with a reduced risk of any diagnosed infant allergic disease and wheeze. After adjustment for potential confounders the relationship with wheeze remained statistically significant. There was also an inverse linear relationship between vitamin C and food allergy. Higher dietary
copper intake was associated with reduced risk of eczema, wheeze and any allergic disease. The relationship with wheeze and any allergic disease remained statistically significant in multivariate analysis, and there was also an inverse linear relationship between copper and food allergy. However, these relationships were only seen for nutrients present in food. There were no relationships between beta-carotene, vitamin E or zinc and any allergic outcomes. In summary, this study suggests that maternal diet of fresh foods rich in vitamin C is associated with reduced risk of infant wheeze, and that copper intake is associated with reduced risk of several allergic outcomes.

**Williams SA, Elliott C, Valentine J, Gubbay A, Shipman P and Reid S.**

Combining strength training and botulinum neurotoxin intervention in children with cerebral palsy: the impact on muscle morphology and strength. Disabil Rehabil. 2012. Purpose: Investigate the combination effects of strength training and Botulinum Toxin Type-A (BoNT-A) on muscle strength and morphology in children with Cerebral Palsy (CP). Methods: Fifteen children receiving BoNT-A, classified as Spastic Diplegic CP, GMFCS I-II, and aged 5-12 years were recruited for this study. Randomly allocated to 10 weeks of strength training either before or after BoNT-A, children were assessed over 6 months. Eight of the 15 children also completed a control period. The Modified Ashworth Scale measured spasticity. The Goal Attainment Scale (GAS) assessed achievement of functional goals. Magnetic Resonance Imaging assessed muscle volume (MV). Instrumented dynamometry assessed strength. Results: Spasticity was significantly reduced following BoNT-A injection (p = 0.033). Children made significant isokinetic strength gains (mean p = 0.022, ES = 0.57) in the intervention period compared to the control period (mean p = 0.15, ES = 0.56). Irrespective of timing, significant strength improvements were seen immediately (10 weeks) and over 6 months for all children. This was also the case for improvements in the GAS (immediately: mean p = 0.007, ES = 4.17, 6 months: mean p = 0.029, ES = 0.99), and improvements in MV in all assessed muscles. Conclusion: The simultaneous use of BoNT-A and strength training was successful in spasticity reduction, improving strength and achieving functional goals, over and above treatment with BoNT-A alone. Muscles targeted for BoNT-A injection should be included in strength training. [Box: see text].


Opportunistic adolescent health screening of surgical inpatients. Arch Dis Child. 2012; 97(10): 919-921. PURPOSE: Opportunistic health screening has long been promoted by advocates of adolescent health. However, there are few objective data documenting the outcomes in an inpatient setting. METHODS: The authors performed opportunistic health screening on 114 surgical inpatients, median age 14 (range 10-18) years, admitted to a general adolescent ward in a tertiary children's hospital. A four-page paper document with a formatted list of questions, based on the Home, Education, Activities, Drugs, Sexual Health, Suicide framework, was developed to standardise screening and documentation. RESULTS: Areas of concern requiring intervention were identified in 34 (30%) patients. Specific interventions included referrals to the Adolescent Medicine clinic (n=6), Hospital School Services (n=7) and Psychological Medicine (n=7). CONCLUSIONS: Consideration should be given to offer adolescent health screening to all surgical inpatients. Further research should involve the participation of young people and should focus on the outcomes, feasibility, acceptability and resource implications of such screening.

**Wilson H and Payne D.**

Real medicine. Journal of paediatrics and child health. 2012; 48(10): E161-164. A substantial part of a paediatrician's work increasingly involves caring for children and young people with mental health, developmental, emotional and behavioural problems. Over time, recognition of these aspects has redefined and broadened the notion of what classically constitutes 'Paediatrics.' This paper discusses the ways in which paediatricians and psychiatrists can support each other in this work. It highlights the role of supervision and specifically advocates for the expansion of consultation/liaison psychiatry services.

**Wilson S, Bremner AP, Mathews J and Pearson D.**

The Use of Oral Sucrose for Procedural Pain Relief in Infants Up to Six Months of Age: A Randomized Controlled Trial. Pain Management Nursing. 2012; [Epub ahead of print]. The aim of this study was to evaluate the effectiveness of oral sucrose in decreasing pain during minor procedures in infants of 1-6 months corrected age. A blinded randomized controlled trial with infants aged 4-26 weeks who underwent venipuncture, heel lance or intravenous cannulation were stratified by corrected age into &lt;4-12 weeks and &lt;12-26 weeks. They received 2 mL of either 25% sucrose or sterile water orally 2 minutes before the painful procedure. Nonnutritional sucking and parental comfort, provided in adherence to
hospital guidelines, were recorded. Pain behavior was recorded using a validated 10 point scale at baseline, during and following the procedure. Data collectors were blinded to the intervention. A total of 21 and 20 infants received sucrose and water, respectively, in the &gt;4–12-week age group, and 21 and 22, respectively, in the &gt;12–26-week age group. No statistical differences were found in pain scores between treatment and control groups at any data collection points in either age group. Infants aged &gt;4-12 weeks who did nonnutritional sucking showed statistically significantly lower median pain scores at 1, 2, and 3 minutes after the procedure than those who did not suck. Infants aged &gt;4-26 weeks exhibited pain behavior scores that indicated moderate to large pain during painful procedures; however, there was insufficient evidence to show that 2 mL 25% sucrose had a statistically significant effect in decreasing pain. Infants should be offered nonnutritional sucking in compliance with the Baby Friendly Health Initiative during painful procedures.

Wong DJ, Iyengar AJ, Wheaton GR, Ramsay JM, Grigg LE, Horton S, Konstantinov IE, Brizard CP and d’Udekem Y


Background Outcomes after atrioventricular (AV) valve operations in patients with functional single ventricles are unclear. Methods From 1988 to 2010, 76 consecutive patients with single ventricles underwent AV valve operations for regurgitation at a single institution. Five replacements, 66 repairs, and 5 valve closures were performed at a median age of 1 year (range, 1 day–14 years) on 43 tricuspid, 9 mitral, and 24 common AV valves. Results Hospital mortality was 17% (13/76). The follow-up was 100% complete. There were 15 late deaths. There were 48 survivors with a mean follow-up of 8.3 ± 6 years. One- and 10-year Kaplan-Meier survival after AV valve operations was 72% (95% confidence interval [CI]: 60%–81%) and 61% (95% CI, 48%–71%), respectively. Independent predictors of overall mortality were presence of a common AV valve (p = 0.03), requirement for postoperative mechanical circulatory support (p = 0.02), and timing of valve operations between initial palliation and performance of a bidirectional cavopulmonary shunt (BCPS) (p = 0.047). Ten-year freedom from valve reoperation and from thromboembolic events of hospital survivors was 56% (95% CI, 38%–70%) and 70% (95% CI, 56%–80%), respectively. At last follow-up, 11 of 48 surviving patients (23%) had moderate to severe regurgitation, and pacemaker implantation was required in 6 patients. Only 34 patients reached the stage of Fontan completion. Conclusions

Wood AJT, Clugston SC, Rawlins JM, Rea S, Edgar DW and Wood FM.

Burn patients, parents and doctors: are we in agreement?

Wood F, Martin L, Lewis D, Rawlins J, McWilliams T, Burrows S and Rea S.
A prospective randomised clinical pilot study to compare the effectiveness of Biobrane(R) synthetic wound dressing, with or without autologous cell suspension, to the local standard treatment regimen in paediatric scald injuries.

BACKGROUND: Scald is the most common cause of burn in children in Australia. The time taken by the burn wound to heal impacts on scar outcome. Commonly scald injuries are treated conservatively; in our unit the practice is that if healing does not occur within 10 days, surgery is used to aid healing with the aim of improving scar outcome. This randomised controlled pilot study compares early treatment regimens to facilitate tissue salvage and reduce the incidence of definitive surgery at 10 days following scald injury. METHODS: All paediatric patients with partial thickness scald injury were clinically assessed between July 1, 2009 and June 30, 2010. A burn of 2% TBSAB or more and deemed not to heal within 10 days, were considered for the trial. These patients were randomised to one of three treatment arms: the local standard treatment (Intrasite, Acticoat and Duoderm((R)) dressings every 2-3 days) with surgery at 10 days, Biobrane((R)) only or Biobrane((R)) and autologous cell suspension using the ReCell((R)) kit. The primary outcome was surgery performed after 10 days; secondary outcomes were rates of healing, pain experienced, and scar outcomes. RESULTS: 15% of scald presentations in the 12 month period met the eligibility criteria. 13 patients were recruited into the pilot study; early intervention was associated with a decreased time to healing with fewer dressing changes, less pain and better scar outcomes. CONCLUSION: Investment of surgical resources in the acute stages within 4 days of injury saved on nursing time, dressing, analgesic and scar management costs.

Wood FM, Giles N, Stevenson A, Rea S and Fear M.
Characterisation of the cell suspension harvested from the dermal epidermal junction using a ReCell((R)) kit.

BACKGROUND: The use of non-cultured autologous cells to promote wound healing and in reconstructive procedures is increasing. One common method for preparing these cells is the use of the ReCell((R)) device. However, despite its current clinical use, no characterisation of the cell suspension produced using a
ReCell((R)) device has been published. **OBJECTIVE:** To characterise the ReCell suspension that is applied to wounds for cell type, viability, yield, stability and proliferative potential. **METHODS:** The ReCell((R)) device was used to harvest cells from a 2cm(2) piece of split-thickness skin isolated using a dermatome. The resulting cell suspension was analysed for cell yield, cell type, viability over time, proliferative potential and reproducibility. **RESULTS:** Average viable cell yield was 1.7x10(6)/cm(2) of tissue, with 75.5% of the total cell isolate viable. Total viable cell number was not significantly reduced after 4h storage at 22 degrees C or 4 degrees C, and was stable for 24h at 4 degrees C. Proliferative potential was assessed using a colony forming assay, with 0.3% of viable cells isolated forming keratinocyte colonies. Predominantly the suspension contained keratinocytes (64.3+/28.8%) and fibroblasts (30.3+/14.0%), with a small population of melanocytes also identified (3.5+/ 0.5%). Finally, the supernatant contained low total protein (0.92mg/ml) and the supernatant had no significant effects on cell viability or growth when applied ex vivo. **CONCLUSIONS:** These results suggest the ReCell((R)) device provides a method for the preparation of a cell suspension with high viability and proliferative potential, containing viable melanocytes and no apparent toxic cell debris. Further work on the sustained viability of these cells in vivo, and in particular after application to the wound, will be important to better understand the potential of the ReCell((R)) device in the clinic.

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SNP-based arrays complement classic cytogenetics in the detection of chromosomal aberrations in Wilms’ tumor.


Wilms’ tumors have characteristic chromosomal abnormalities, such as the 11p13 deletion, in a subset of cases. This is one of the very few reports comparing single nucleotide polymorphism (SNP) array analysis with conventional karyotyping of Wilms’ tumors. A total of 43 frozen tumor samples were analyzed using the Affymetrix Cytogenetics Whole-Genome 2.7 M array. The findings from the SNP array analysis were then compared with those from conventional karyotyping. A comparison between SNP array and conventional karyotype findings was possible in 38 of 43 specimens (88.4%). The SNP array and classic cytogenetic results were concordant in 33 of 38 specimens (87%). SNP array analysis was able to support the findings of classic cytogenetics. The SNP array detected regions of loss of heterozygosity (LOH) in 41 of 43 (95%) specimens. However, it did not detect balanced translocations and inversions that were observed by conventional cytogenetics. Our results show that the data generated from these platforms are complementary. The SNP array also detected additional gains and losses as well as regions of LOH with associated disomy, which are likely to represent segmental uniparental disomy. The observed discrepancies can be explained by the inherent limitations of each technique.