

**P09 THE USE OF COCHRANE REVIEWS IN CLINICAL GUIDELINES FOR RESPIRATORY DISEASE IN CHILDREN IN THE UNITED KINGDOM – A SYSTEMATIC REVIEW**

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**Aims** Cochrane reviews (CRs) summarise best evidence and should be used for guideline recommendations. We assessed the use of CRs in UK guidelines for lower respiratory disease in children and the agreement between the guideline recommendations and the CRs.

**Methods** We searched Embase, Pubmed and the websites of guideline commissioning agencies for clinical guidelines. For each guideline recommendation, we identified relevant CRs in the Cochrane Library. We noted whether the CRs were cited in the guidelines and if they agreed with the guideline recommendations. Two investigators independently assessed CRs for relevance and agreement. We investigated the influence of the guideline commissioning agency and the topic, upon whether CRs were cited and whether their conclusions were followed. We investigated factors influencing the use of CRs, using logistic regression.

**Results** We identified 21 guidelines which made 1025 recommendations, of which 555 were recommendations for treatment of lower respiratory disease in children. For 115 of these 555 recommendations (21%) we identified a CR which could inform the recommendation. Approximately, one third of these recommendations (40/115) did not use any of the available CRs or used only some. The guideline commissioner had a significant influence on the use of CRs ( $p = 0.03$ ), with BTS guidelines performing best. Guidelines on some topics eg cystic fibrosis were significantly more likely to cite CRs than others eg asthma ( $p = 0.007$ ). In 20/115 guideline recommendations there was not full agreement with the CR Conclusion 9 (8%) disagreed, 6 (5%) partial agreement and 5 (4%) the guideline made a strong recommendation not supported by the CR.

**Conclusion** In spite of the work of the Cochrane collaboration, there are still many treatment decisions where there is no systematic review to inform guideline recommendations. However, we have shown that, even where a CR exists, guideline writers may not make use of it or may make recommendations contrary to the findings of the review. Guideline writers should describe their search strategy and reasons for not including high quality evidence.

**P10 SURVEILLANCE OF HYPOCALCAEMIC SEIZURES SECONDARY TO VITAMIN D DEFICIENCY IN CHILDREN IN THE UK**

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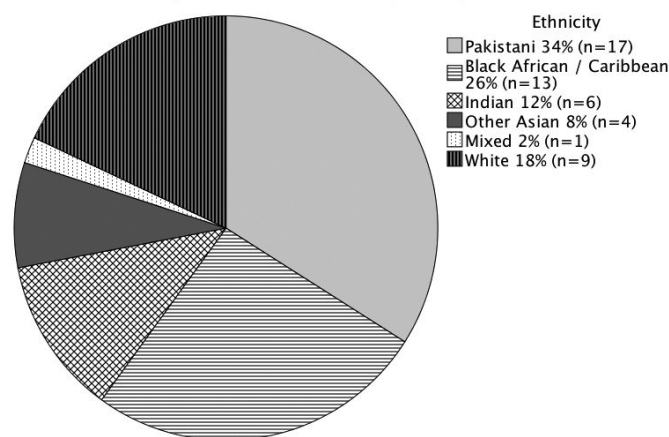
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**Background** Reports suggest that rickets is an increasing concern among children in the UK, despite national recommendations for vitamin D supplementation during pregnancy and early childhood. However, there is limited epidemiological data to quantify these concerns, existing studies being limited to regional case series.

**Methods** Prospective national surveillance of hypocalcaemic seizures secondary to vitamin D deficiency in children aged 0–15 years, across the UK and Ireland via the British Paediatric Surveillance Unit (BPSU) system. We report results for the first 13 months of surveillance (September 2011 to September 2012).

**Results** 70 case notifications were received; 44 were confirmed cases, 6 probable cases, 17 reported in error or duplicates, and 3 unconfirmed cases for which details are pending. 90% of the 50

confirmed and probable cases were infants ( $n = 45$ ), with three cases aged 1 year (6%) and two aged 14 years (4%). This equates to an incidence of 5.2 per 100,000 in infants. There was a male predominance of 76% ( $n = 38$ ). Ethnic distribution of cases is shown in the figure 1. 60% of children ( $n = 30$ ) had multiple seizures, and 24% ( $n = 11$ ) had seizures lasting > 10 minutes. 66% of cases did not exhibit any other clinical features of vitamin D deficiency ( $n = 33$ ), 26% had clinical rickets ( $n = 13$ ), and 8% had failure to thrive ( $n = 4$ ). None of the children had fractures or intracranial haemorrhage. I.v. calcium gluconate was given in 48% of cases ( $n = 24$ ) and anti-seizure medication in 26% ( $n = 13$ ), with 42% ( $n = 21$ ) not receiving any acute treatment. There were no deaths, and only one child had sequelae on discharge; an extravasation burn from i.v. calcium gluconate.



**Abstract P10 Figure 1** Distribution of cases by ethnicity

**Conclusions** Although a relatively uncommon presentation of vitamin D deficiency, between September 2011 to September 2012 approximately one child has a seizure secondary to vitamin D deficiency per week in the UK. This suggests that current implementation of public health policy is not successful at preventing complications of severe vitamin D deficiency in children. Further studies are required to investigate the epidemiology of rickets more broadly in the UK.

**P11 CAN REAL-TIME PERFORMANCE FEEDBACK IMPROVE CHEST COMPRESSION QUALITY DURING SIMULATED INFANT CPR? A RANDOMISED CONTROLLED TRIAL**

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**Aims** Current International Liaison Committee on Resuscitation (ILCOR) guidelines emphasise the provision of high quality chest compressions during infant cardiopulmonary resuscitation (CPR). Recent research, however, reports that <1% of all chest compressions achieve all four internationally recommended quality targets during simulated infant CPR. This study aimed to determine if 'real-time performance feedback' improved the quality of chest compressions provided during simulated infant CPR.

**Methods** Sixty-nine certified European and Advanced Paediatric Life Support (EPLS and APLS) training course instructors were recruited from seven EPLS/APLS training courses. Instructors were randomly

allocated to either a 'no-feedback' or 'feedback' group, and performed 60 seconds of two-thumb (TT) and two-finger (TF) chest compressions on a "physiological" CPR manikin instrumented to measure chest deflections. Baseline data were recorded for both groups without feedback, before chest compressions were repeated in the experimental phase with the 'feedback' group receiving real-time performance feedback. Chest compression depths, chest release forces, chest compression rates and compression duty cycles were recorded for all participants. Quality indices were calculated to report the proportion of chest compressions that achieved internationally recommended quality targets for each measure, with an overall quality index calculated to report the proportion of chest compressions that simultaneously achieved all four quality targets. Results were compared between the 'no-feedback' and 'feedback' groups.

**Results** Baseline data were consistent with other studies, with < % of chest compressions simultaneously achieving all four internationally recommended quality targets. During the experimental stage (Table 1), the provision of real-time performance feedback improved the quality of the chest compression depths, chest compression rates and compression duty cycles provided by both techniques (all measures:  $p < 0.001$ ). This enabled the 'feedback' group to simultaneously achieve all four quality targets in 75% of TF and 80% of TT technique chest compressions, whilst <1% of chest compressions achieved this for the 'no-feedback' group.

**Conclusions** Real-time performance feedback considerably increased the quality of chest compressions provided during simulated infant CPR. If these results transfer into clinical practise this technology could, for the first time, support resuscitators in performing high quality chest compressions during infant CPR and thus potentially improve future outcomes.

#### P12 CHILD DEATHS DUE TO INJURY IN FOUR UK COUNTRIES: 1980 TO 2010

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**Aims** To examine trends in child deaths due to injury England, Scotland, Wales and Northern Ireland between 1980 and 2010.

**Methods** Data from death certificates from children who died aged 28 days to 18 years between 1980 and 2010 were obtained from the national statistics agencies in the four countries. Injury deaths, including poisoning, was defined by an external cause code (from the International Classification of Diseases) recorded as the underlying cause of death. We estimated rates of injury deaths per 100,000 resident children by sex, age group (28 days to nine years, and 10 to 18 years), time period, country of residence and type of injury (accidental or non-accidental). Mortality rates were adjusted for reporting delay.

**Results** Child mortality due to injury has declined in all four countries of the UK. England consistently experienced the lowest mortality rate throughout the study period. For children aged 28 days to nine years, differences in mortality rates between England and the other three countries declined over the study period, whereas for children aged 10 to 18 years, differences in mortality rates increased. Inter-country differences were largest for boys aged 10 to 18 years with mortality rate ratios of 1.34 (95% confidence interval 1.13, 1.60) for Wales, 1.66 (1.46, 1.89) for Scotland and 1.83 (1.52, 2.21) for Northern Ireland compared to England (the baseline). The decline in mortality due to injury was accounted for by a decline in accidental deaths; no declines were observed for any age groups for non-accidental deaths, that is deaths caused by self-harm, assault or from undetermined intent.

**Conclusions** Whilst child deaths from injury have declined in all four UK countries, substantial differences in mortality rates remain between countries, particularly for older boys. This group stands to

gain most from policy interventions to reduce deaths from injury and poisoning in children.

#### P13 'EFFORT OF BREATHING' IS NOT AN IMPORTANT PARAMETER IN A PAEDIATRIC EARLY WARNING SCORING SYSTEM

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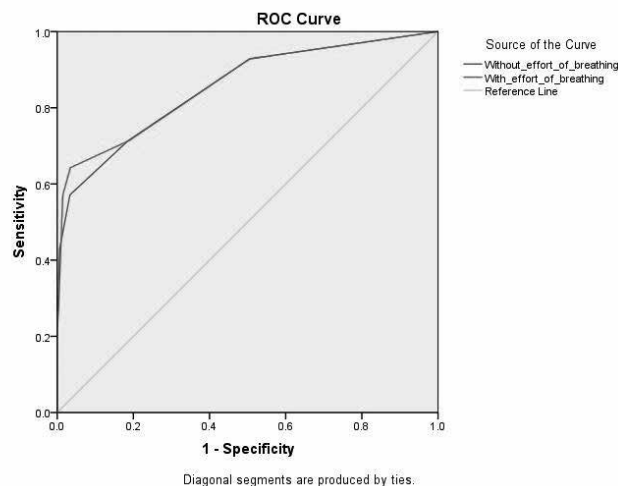
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**Aims** Across the UK there is diverse practise in the use of Paediatric Early Warning Scores (PEWS). Many scoring systems are in use and include different physiological parameters to identify children at risk of life-threatening deterioration. Unlike adult practise, PEWS often comprise of both objective and subjective criteria. 'Effort of breathing' is a subjective parameter commonly included in paediatric scoring systems. Determining a child's effort of breathing is influenced by factors including appropriate exposure of the patient as well as clinical skill, experience and acumen of the scorer.

As part of a study assessing the validity of PEWS charts, a large data set was collected. Analysis of the NHS Institute PEWS chart is made here.

**Method** Physiological parameters were collected retrospectively from a cohort of 1537 children aged 0–16 years attending a district general hospital's Children's Emergency Department over a 5 week period. Admission to Paediatric High Dependency or Intensive Care were used as proxy outcome measures for serious and life-threatening deterioration.

**Results** Data was complete for 967 records. At a best cut-off score of 3, NHS Institute PEWS had a sensitivity of 64.3% (95% CI 35.6–86.0), specificity of 96.5% (95% CI 95.1–97.6), positive predictive value of 21.4% (95% CI 10.8–37.2) and negative predictive value of 99.5% (95% CI 98.7–99.8). The area under the Receiver Operating Characteristic curve (AUC) (figure 1) was 0.86 (95% CI 0.74–0.98,  $p < 0.01$ ). If 'effort of breathing' was excluded from NHS Institute PEWS the AUC was 0.85 (95% CI 0.74–0.97,  $p < 0.00$ ).



**Abstract P13 Figure 1** Receiver operating characteristic curve for NHS Institute PEWS with and without effort of breathing.

**Conclusion** The NHS Institute PEWS is a valid tool with good diagnostic accuracy in recognising children at risk of serious and life-threatening deterioration at triage in the Emergency Department. The predictive power did not change when 'effort of breathing' was excluded. It is reassuring that such a subjective parameter does not undermine the value of the scoring system. However, further work is needed to determine whether other subjective measures have any value in paediatric early warning tools.