Aims and methods This prospective longitudinal study aimed to identify whether standard and/or novel biomarkers are useful for monitoring and predicting LN disease activity. Using patients recruited to the UK JSLE study, urine and blood samples were collected during routine clinical reviews. The study had full ethical approval.

Results The JSLE cohort (n = 64), seen at 3 (interquartile range IQR: 2–5) clinical reviews over 364 (182–532) days were aged 14.1 (11.8–15.8) years and 80% female. Active renal episodes (23% total; renal BILAG A/B) had significantly increased concentration of; monocyte chemoattractant protein 1 (MCP1), neutrophil gelatinase associated lipocalin (NGAL), erythrocyte sedimentation rate, anti-double stranded DNA, urine albumin:creatinine ratio (UACR), creatinine, and reduced complement 3 (C3), C4 and lymphocytes. Cross sectional multivariate analysis demonstrated MCP1 and C3 as independent variables ($p < 0.001$) for active renal disease. Longitudinally, MCP1 was an excellent predictor of improved renal disease (area under the curve AUC: 0.81; $p = 0.013$; concentration 343pg/ml, specificity 71%, sensitivity 70%); NGAL was a good predictor of worsened renal disease activity (AUC 0.76; $p = 0.04$; concentration 30ng/ml, specificity 60%, sensitivity 61%). Standard markers could not predict disease activity changes.

Conclusion Novel biomarkers (MCP1, NGAL) are able to predict changes in JSLE related renal disease activity. Biomarker-led monitoring may facilitate earlier intervention to prevent renal damage. The development of point of care biomarker testing is now in progress.

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P04 ADIPOSITY OF HEALTHY, FULL-TERM BREAST-FED AND FORMULA-FED INFANTS: A PROSPECTIVE COHORT STUDY

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Aims Although an association exists between method of feeding in infancy and increased risk of later overweight and obesity, it is unclear whether this represents a causal relationship. One plausible mechanism of action is through alteration in adiposity in infancy. We aimed to compare longitudinal changes in adiposity in healthy, full-term, breast-fed (BF) and formula-fed infants (FF).

Methods Research Ethics Committee and NHS approvals were obtained. With informed maternal consent, healthy, term infants underwent whole body magnetic resonance imaging and hepatic spectroscopy to assess body composition and intrahepatocellular lipid (IHCL) content. Investigations were performed in natural sleep on two occasions, shortly after birth (T1), and between two and three months (T2) in accordance with our previously published protocols. Anthropometric measurements were obtained at both visits. Feeding was categorised according to World Health Organisation definitions. Comparison was made between exclusively or predominantly BF, and exclusively or predominantly FF infants. We used independent sample t-tests to compare body weights and multivariable regression to examine total and regional adipose tissue volumes at T2, with adjustment for baseline adiposity and body weight. Adipose tissue volumes (litres) and IHCL (ratio of lipid to water peak) are presented as mean (95% confidence interval).

Results Eighty-six infants were studied at T1, median [interquartile range] 13 [8–19] days, and 73 at T2, 63 [57–70] days. Of these, 38 infants were wholly or predominantly BF and 26 wholly or predominantly FF at both time points. At T2, while FF infants were heavier (mean, standard deviation: 5.399kg, 0.661kg; FF 5.435kg, 0.68kg); $p = 0.045$), total adiposity was not significantly different (BF 1.516 (1.433, 1.600); FF 1.633 (1.531, 1.735); $p = 0.08$). There were no statistically significant differences in regional adipose tissue volumes or IHCL (BF 2.398 (1.838, 2.958); FF 2.406 (1.708, 3.103); $p = 0.9$).

Conclusions While adiposity does not differ substantially between BF and FF infants by 9 weeks of age, further longitudinal evaluation is required to determine if the trend to greater total adiposity in FF infants is subsequently amplified.

P05 LEARNING FROM THE EXPERTS: UNDERSTANDING CHILDREN'S EXPERIENCES OF BEING NEWLY DIAGNOSED WITH CANCER

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Aim Being given a diagnosis of cancer is a significant and highly distressing event for both children and their families. There has been a significant amount of research looking at parents' experiences and communication preferences at the time of diagnosis but little research has been done to explore and understand children's feelings. This qualitative study aims to understand from the child's perspective what it feels like to be told you have cancer with the hope that increased understanding can lead to improved communication and support for children newly diagnosed with cancer.

Methods The study was conducted using qualitative methodology. Children from a UK principle oncology centre were purposefully selected to participate. The children were enrolled within 4 weeks of being diagnosed with cancer and took part in semi-structured interviews conducted using the draw and write technique. The interviews aimed to explore children's experiences around the time of diagnosis. The results were analysed using interpretative phenomenological analysis.

Results Six children, aged 8 – 12 years, with a new diagnosis of cancer were interviewed. Five super-ordinate themes were identified: 1) Initially I felt shocked and scared. 2) Chemo is an awful thing. 3) Please talk to me: the more I know the better I feel. 4) I will accept treatment and quickly get used to it because I know I will get better. 5) My family are vital.

Children say that initially they feel shocked and scared. They continue to feel scared until they understand exactly what will be done to them. Then despite experiencing chemotherapy as an awful event, with information and help from family, they can learn relatively quickly to accept their diagnosis and treatment. However, this acceptance is in the unquestioning belief that the treatment will lead to cure.

Conclusions Children have unique needs at the time of being diagnosed with cancer. In order to minimise suffering clinicians must be prepared to talk to children directly. Children want to know, at the earliest opportunity, what will happen to them and that there is a potential for cure.

P06 BACTERIAL MENINGITIS IN BABIES 0–90 DAYS OF AGE: A UK AND REPUBLIC OF IRELAND PROSPECTIVE STUDY

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Background and aims Meningitis in the first 3 months of life is associated with significant mortality and morbidity. Previous UK studies were conducted in the 1980s and 1990s. It is important to define the current burden of disease in order to prioritise treatment and prevention strategies.
Methods Cases were identified prospectively by active surveillance through the British Paediatric Surveillance Unit, routine microbiological surveillance through the Health Protection Agency and via parents of cases through meningitis and Group B streptococcus (GBS) support charities. The surveillance period was July 2010 – July 2011.
Results 365 cases were identified, equivalent to a total incidence of 0.38/1000 live-births (95% CI: 0.35- 0.42); for late-onset (n = 252) was 0·27 per 1000 (0·23—0·30), and for early-onset (n = 113) was 0·12 per 1000 (0·10—0·14). The male to female ratio was 1.3:1. The median age of disease (IQR) was 14 days (3–36). The majority of cases (62%) were admitted from home. Lumbar puncture was performed in 319/329 (97%) of the cases. The timing of LP was available in 307 (96%) and was before the first dose of antibiotics in only 110/306 (36%) of the cases.

Of the 304 organisms isolated 151 (50%) were Group B Streptococcus (GBS), 40 (13%) *E coli*, 28 (9%) *Streptococcus pneumoniae* (SPn), 24 (8%) *Meningococcus,* 11 (4%) *Listeria monocytogenes*, 24 (8%) other Gram positive bacteria and 24 (8%) other Gram negative bacilli. Overall, blood culture was negative in 134/329 (41%) of cases of meningitis.

At the time of reporting or discharge 25 babies had died [CFR 7.6, 95% CI: 5.0–11.0). Spn-specific CFR (19%) was significantly higher than GBS-Specific CRF (5%). An acute complication was identified in 78/304 (26%) of the survivors.
Conclusion There remains a significant burden of bacterial meningitis in the first 3 months of life. The leading causes remain unchanged for the past three decades. Further work should be done on the prevention and early management of cases

P07 PAEDIATRIC DIABETIC KETOACIDOSIS MANAGEMENT PRIOR TO REFERRAL TO A PAEDIATRIC INTENSIVE CARE RETRIEVAL SERVICE

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Background Diabetic ketoacidosis (DKA) is the leading cause of morbidity and mortality in children with type 1 diabetes mellitus. Mortality is predominantly related to the occurrence of cerebral oedema. Management guidelines aim to minimise the risk by producing slow correction of the metabolic abnormalities.

We audited the initial management of children in DKA at referring hospitals prior to referral to a paediatric intensive care retrieval service for advice and/or retrieval.
Methods Data was retrospectively collected on all children in DKA referred to a regional paediatric intensive care retrieval service between 1.4.09 and 31.3.12. Management at referring hospitals was compared to UK guidelines (BSPED 2009).
Results There were 121 episodes of DKA in 115 patients (median age 12.5 (0.7–16.4) years, 45% male). In 72 (60%) cases, DKA was the initial presentation of diabetes. Mean(SD) initial pH was 6.97 (0.11). In 29 (24%) cases, osmotherapy was given because of concerns about cerebral oedema. 34 (28%) cases were retrieved to a paediatric intensive care unit.

115 (95%) cases received fluid boluses as initial resuscitation (mean 22ml/kg). 17 (14%) received more than the recommended maximum of 30ml/kg (40ml/kg n = 11, 50ml/kg n = 4, 60ml/kg n = 2).

Median estimated degree of dehydration was 8% (0–10%). 25 (21%) cases were estimated to be 10% dehydrated (recommended maximum 8%). Deficit was corrected over 48 hours in all cases. Fluid calculations were correct in 39/63 (62%) cases. The commonest reasons for error were failure to subtract initial fluid boluses and inaccurate maintenance calculation. Potassium replacement was given in 76% cases. Bicarbonate (not recommended) was given in 4 (3.3%) cases.

4 patients received an initial insulin bolus (not recommended). The insulin infusion rate was <0.05 units/kg/h in 2 cases, 0.05 units/kg/h in 30 cases and 0.1units/kg/h (recommended) in 80 (66%) cases. Insulin had not yet been commenced in the remaining 9 cases.
Conclusion Despite the existence of clear guidelines, a significant proportion of children with severe DKA received excessive fluid resuscitation, inappropriately/inaccurately calculated ongoing fluid replacement and lower-than-recommended insulin infusion rates. These findings highlight areas that need ongoing education to improve patient care.

P08 RETROSPECTIVE EVALUATION OF A NEW NEONATAL TRIGGER SCORE

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Aims At present there is no published validated clinical scoring system for neonates. We aimed to design and validate an objective clinical scoring system to identify unwell neonates, using routinely collected bedside observations.
Methods A Neonatal Trigger Score (NTS) was designed using local expert consensus and incorporated into a new observation chart (see Figure 1). All neonates over 35 weeks gestation admitted to the Neonatal Intensive Care Unit (NICU) over an 18-month period, and an age-matched "well" cohort, were retrospectively scored using the newly constructed NTS and all established Paediatric Early Warning System (PEWS) scores.
Results Scores were calculated for 485 neonates. The NTS score area under the receiver operating characteristic (ROC) curve was 0.924 with a score of 2 or more predicting need for admission to NICU with 77% sensitivity and 97% specificity. Neonates scoring 2 or more had increased odds of needing intensive care (odds ratio [OR] 48.7, 95% confidence interval [CI] 27.5–86.3), intravenous fluids (OR 48.1, 95% CI 23.9–96.9) and continuous positive airway pressure (OR 29.5, 95% CI 6.9–125.8). The NTS was more sensitive than currently established PEWS scores.

Consideration was also given to which scoring parameters were the most predictive. We postulated that performance of the score might be improved by excluding low temperature as a scoring parameter. However, because of recent concerns over hypothermia being an unrecognised sign of sepsis it was felt not appropriate to completely omit a low temperature. This score adjustment resulted in an area under the ROC curve of 0.936.
Conclusions The NTS observation chart acts as an adjunct to clinical assessment, highlighting unwell neonates. Its simplicity allows successful and safe use by non-paediatric specialists. NTS out-performed PEWS, with significantly better sensitivity, particularly in neonates who deteriorated within the first 12 hours after birth ($p < 0.001$) or in neonates with sepsis or respiratory symptoms ($p < 0.001$). Neonates with a score of 1 should be reviewed and those scoring 2 or more should be considered for NICU admission for further management.