saturation profiles using the newest saturation recording devices in apparently asymptomatic babies reveals previously unsuspected reduction in oxygen saturations. The significance of this is not clear as there are limited data on normative values in this population.

A pilot study of oxygen saturation limits in 40 healthy term newborns was designed to define normative values, with the aim of better informing interpretation of oxygen saturation profiles in ex-preterms.

Methods Overnight saturation monitoring was undertaken in healthy term newborns aged 24–36 hours using the MASIMO Radical 7 device. Recording was for up to 12 hours and mothers logged pertinent events.

Results To date 19 studies have been completed. A 5000 replicate robust quantile bootstrap methodology with outlier detection² was used to give a 95% reference range with a 90% confidence interval for each respective value as below: (table 1)

Abstract G218(P) Table 1

	n=19
Mean saturations (%)	95.7
Median saturations (%)	97.98
5th centile (%)	94.98
95th centile (%)	99.51
Number of dips per hour (mean)	29.8
Minimum saturation level in a dip (%)	74

Significant dips to 74% occurred in 3 subjects, all coincident with handling, feeding and/or changing. Collecting data has been hampered by frequent movement artefact triggering alarms and resulting in removal of sensors.

The study is ongoing, and a time-dependent reference range will be constructed using a hierarchical regression approach to summarising data, in order to deal with covariance and increase resolution of the final range. We anticipate that greater number of data points will result in widening of the reference range at the lower end.

Conclusions Interim data using the next generation of monitors demonstrate oxygen saturations >93% for >95% of the time, in healthy newborns, suggesting that this should remain the target for ex-preterm babies when discharged home. Recording normative data may be improved with a two point sensor application to minimise movement artefact.

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British Society for Paediatric Endocrinology and Diabetes

G219

HYDROCORTISONE TABLETS: HUMAN FACTORS IN MANIPULATION AND THEIR IMPACT ON DOSING ACCURACY

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Background Exposure to deficient or excess glucocorticoids is associated with increased morbidity in patients with adrenal insufficiency. An age-appropriate low dose hydrocortisone formulation is not available and manipulation of adult medication is required with potential for inaccurate dosing. Licensed pharmaceutical products must contain $\pm 10\%$ of labelled drug content.

Aims To assess the variability in manipulation procedures undertaken by parents/carers and to quantify the dose-variability in the manipulated product based on the method of preparation.

Methods Parents of children with adrenal insufficiency completed a survey assessing the methods used to manipulate hydrocortisone 10 mg tablets. A sub-group were asked to manipulate a scored 10 mg hydrocortisone tablet (Auden Mackenzie brand) to provide the prescribed dose for their child as they would at home. Hydrocortisone content was analysed according to the current European Pharmacopoeial method.

Results One hundred and twenty-nine parents completed the questionnaire. Overall 55% of parents break or cut the tablet and 43% suspend the tablet in water prior to administration. 34% are prescribed a dose indivisible by 2.5 mg of whom 33% break the tablet to acquire the dose. Twenty-seven parents/carers participated in the sub-study and the target doses they prepared ranged from 0.5–7.5 mg. Forty eight per cent of the preparations were within 10% of the target dose; 74% were within 20% and 82% were within 30%. Based on this small sample size the most accurate method of tablet manipulation is to split the tablet along the score lines. However, this is only possible for doses divisible by 2.5 mg. Dispersion of the tablet in water and withdrawal of the relevant volume was associated with poor accuracy.

Conclusions Children are at risk of suboptimal dosing when parents/carers are required to manipulate adult products to provide the appropriate dose to children. This risk is greatest

when doses need to be prepared via dispersion of a tablet and calculation of the volume to withdraw. This may be related to the poor solubility of hydrocortisone which makes formation of a homogenous liquid difficult. There is a need for age-appropriate hydrocortisone products to be available to children.

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G220 CHANGING PATTERNS OF GROWTH IN PRADER-WILLI SYNDROME

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Introduction/aim Children with Prader-Willi syndrome (PWS) show alterations in infantile, childhood and pubertal growth. Growth Hormone (GH) therapy is recommended due to reported improvements in height velocity (HV) and body composition. The aim was to describe the patterns of growth in PWS and the influence of both changes in clinical practice and GH therapy.

Methods Height SDS(HSDS), BMISDS and HVSDS of children attending a dedicated PWS clinic, 2000–2017, were analysed. To identify changes in growth we compared growth parameters between 2000–2012 and 2013–2017. In 21 children who received GH (median age at GH start 4.92 years (2.27,8.1)), consecutive measurements were available at -1, 0,+1 and +2 years from GH start.

Results Overall, 60 children (31 F/29 M) were included. Three phases of growth after the age of 1 year were identified: 1–5 years, with acceleration in both HSDS(r , 0.310, p , <0.0001) and BMISDS(r , 0.602, p , <0.0001); 6–12 years, with stabilisation in both HSDS(r , 0.063, p , 0.417) and BMISDS(r , -0.154, p , 0.087); and 13–18 years, with deceleration in HSDS(r , -0.383, p , <0.0001) and unchanged BMISDS(r , 0.015, p , 0.896).

Abstract G220 Table 1

Age	1 year	5 years	12 years	16, 17 years
Number	32	30	16	31
HSDS	-1.82 (-3.99,-0.08)	-0.76 (-4.16,2.25)*	-0.59 (-2.27,1.59)	-2.66 (-4.27,-0.64)
BMISDS	-0.83 (-3.27,1.85)	2.51 (-2.36,5.63)*	1.94 (-0.13,4.3)	2.52 (-1.5,4.18)

* p , <0.0001 vs age 1 ** p , <0.0001 vs age 5 and age 12

At age 5, children in 2013–2017 (n ,12) had higher HSDS [median, -0.08 (-1.74,1.54) vs -1.04(-4.16,0.5)] than those in 2000–2012 (n ,18) (p ,0.03). At age 12, children in 2013–2017 (n ,5) had higher HSDS [median, 1.13 (-0.62,1.59) vs -1.35 (-4.27,0.23)] (p ,0.027) and lower BMISDS [median, 1.05 (-0.13,2.14) vs 2.44 (0.13,4.3)] (p ,0.032) than those in 2000–2012 (n ,11). After 2 years on GH, median HSDS improved from -1.43 (-4.59,0.95) to -0.11(-3.53,1.57) (p , <0.0001) and median HVSDS from 0.62 (-5.9,4.17) to 2.8 (-2.2,5.2) (p ,0.027). BMISDS was unchanged (Table 1).

Conclusion We were able to delineate 3 distinct phases of growth in PWS. Changes in our clinical practice have led to

improvements in both height and BMI. GH therapy was associated with an increase in height and stabilisation of BMI.

G221 VITAMIN D STATUS OF BREASTFEEDING INFANT-MOTHER PAIRS IN SOUTH-WESTERN NIGERIA

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Aims Poor vitamin D status is currently a global public-health issue including regions where the risk of vitamin D deficiency was previously assumed to be low due to cutaneous synthesis of vitamin D stimulated by continuous exposure to sunlight. Evidence suggests that exclusively breastfed infants are at risk of low vitamin D status; a risk factor for future poor health. No guidelines currently exist for vitamin D supplementation in Nigeria. The study aimed to determine the plasma vitamin D concentrations of study subjects, provide the much needed information on the prevalence of vitamin D deficiency in maternal and breastfeeding infants, as well as the relationship between maternal and infant blood vitamin D levels.

Methods This cross-sectional study involved 120 breastfeeding infant-mother pairs. Maternal and infant blood samples were taken at the same time. A solid phase competitive enzyme linked immunosorbent assay (DLD Diagnostika GmbH, Germany), was used for the quantitative determination of 25-OH vitamin D in plasma, and read out using Acurex plate (Acurex Diagnostics, USA). Low and normal level controls were assayed in duplicate during each run.

Results The mean plasma vitamin D concentrations in the maternal and breastfeeding infant blood were 18.86 ± 6.56 ng/mL and 24.12 ± 9.10 ng/mL respectively. Seven (5.8%) mothers had normal vitamin D levels while 70 (58.3%) mothers had hypovitaminemia (vitamin D concentration below 20 ng/mL). Also, 28 (23.3%) of the 120 breastfeeding infants had normal vitamin D levels while 43 (35.8%) had hypovitaminemia. The mean plasma vitamin D concentration in breastfeeding infants was significantly higher than maternal plasma vitamin D concentration ($t=5.995$, $p<0.001$). There was a positive correlation between paired maternal and breastfeeding infant blood vitamin D concentrations ($r=0.282$, $p=0.002$).

Conclusion The findings from this study indicate that vitamin D deficiency is a major public health issue in this region. Therefore we recommend that efforts be made to implement vitamin D supplementation of exclusively breastfed infants and their mothers in this region.

G222 FASTING BLOOD TESTS IN CHILDREN? NO!

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Aims Fasting blood tests (FBTs) are unnecessary and potentially dangerous in children. They may lead to hypoglycaemia and collapse, or delayed diagnosis of type 1 diabetes mellitus