Results Optimal cut-off values for automatically detected inspiratory and expiratory wheezing were 2% and 3%, respectively. The resulting sensitivity of inspiratory and expiratory wheezing were 83.3% and 84.6%, and the specificity 78% and 82.5%, respectively (Figure). The inter-rater agreement was moderate with a Fleiss' Kappa of 0.59 for inspiratory wheezing and 0.54 for expiratory wheezing.
Conclusion Computerised lung sound analysis is feasible already during the first months of life and provides quantitative and noninvasive information about the extent of wheezing, whereas the assessment by trained clinicians was subjective and only moderate in inter-rater agreement.

PS-180 MEASUREMENT OF FRACTIONAL NITRIC OXIDE CONCENTRATION IN EXHALED BREATH IN MONITORING THE PAEDIATRIC PATIENT

A Aramburu, M Ballesta, C Juzga, J Ferrés. *Pediatrics, Hospital de la Santa Creu i Sant Pau, Barcelona, Spain*

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Introduction Fraction of exhaled nitric oxide (FeNO) is a biomarker of eosinophilic airway inflammation, determining airway responsiveness to inhaled corticosteroid treatment and atopy. It is a non-invasive, reproducible, simple and safe method of measuring airway inflammation that provides a complementary tool to other ways of assessing airways disease, including asthma.
Methods Retrospective descriptive study. The data of 99 paediatric patients attending outpatients in paediatric pneumology (from July 2012 to June 2013) with 2 consecutive measurements of FeNO was included. Characteristics of sex, age, exercise-induced asthma, prick test, FeNO, forced expiratory volume (FEV1), asthma control test (ACT) and baseline asthma treatment were analysed.

The variations in FeNO, ACT, exercise-induced asthma and FEV 1 after intensifying or initiating treatment were collected.
Results 99 patients, 46 men and 53 women were included. The mean age of the study population was 12.5 years (5–17) with an initial average ACT of 20.13 (10–25), FEV1 of 78% (42–132%) and an initial FeNO of 51.02 (7 -170). 95.8% had a positive prick test. 45 exercise tests were performed, in 18 (40%) of them a decrease in FEV1 >10% was found. 15.2% of the patients were not taking any treatment at the first visit, 23.3% received Smart therapy (long-acting beta2- agonists and inhaled corticosteroids), 20.2% beta2- adrenergic agonist, 15% therapy Smart + montelukast, inhaled corticosteroids 13.1% and 13% other combined therapies.

A statistically significant decrease in FeNO to 31.9 t = 6.594 (p = 0.000) was found after starting treatment, intensifying or modifying basic treatment. A statistically significant correlation was found between FeNO decrease and ACT improvement r = -0398 (p = 0.000) and FEV1 r = -0.260 (p = 0.01) between the first and the second visit.
Conclusions The decrease in airway inflammation correlates with an increased subjective control of the disease and also with a higher forced expiratory volume. In our series of patients these results were achieved increasing Smart treatment therapy, as well as adding inhaled corticosteroid in patients not previously taking, including other treatment options. The value of FeNO also served to identify non-compliant patients.

PS-180a ANTIBIOTICS USE IN INFANTS HOSPITALISED WITH ACUTE BRONCHIOLITIS IN SOUTHEAST NORWAY

[1]E Dahl-Hansen, [1]HO Skjerven, [2]P Mowinckel, [1]KH Carlsen, [2]KCL Carlsen. *[1]Institute of Clinical Medicine, University of Oslo, Oslo, Norway; [2]Departement of Pediatrics, Oslo University Hospital, Oslo, Norway*

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Background Airway viruses, most often respiratory syncytial virus, cause acute bronchiolitis. Despite no evidence of its effect, 30–100% of hospitalised children globally receive antibiotics. The aim of the study was to identify the rate of antibiotics use in hospitalised infants with moderate to severe acute bronchiolitis in Norway.
Methods 404 infants hospitalised with moderate to severe acute bronchiolitis in eight centres in Southeast Norway completed a clinical trial of inhaled racemic adrenaline[1] was included in this study. The mean length of stay was 3.3 days, 43.6% received oxygen support, 29.0% nasogastric tube feeding and 7.4% ventilatory support.
Results 8.4% (n = 34) of the patients received systemic antibiotics, (17 intravenous and 17 oral), most commonly penicillin (41%), ampicillin (26%) and gentamicin (24%). Use of antibiotics versus no antibiotics was significantly associated with a longer hospital stay (mean 135.5 h (95% CI 117.0–154.1) vs 65.9 h (95% CI 47.2–85.1), p < 0.001) and use of supportive therapy (all p < 0.03). Patients receiving supportive therapy more often received antibiotics than those without supportive therapy: oxygen (17.4% vs 1.4%, p < 0.001), nasogastric tube feeding (15.5% vs 5.7%, p = 0.03) and ventilation (CPAP) (48.3% vs 5.3%, p < 0.001).
Conclusion The use of antibiotics is substantially lower than previously reported in any geographical region. With length of stay and use of supportive care comparable to other countries, we believe the finding supports a conservative approach in bronchiolitis management.

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Necrotizing Enterocolitis

PS-181 PROBIOTICS (INFLORAN®) FOR NEC PREVENTION: INFLUENCE OF ENTERAL NUTRITION

[1]M Thanhaeuser, [1]A Repa, [2]M Weber, [3]D Endress, [1]A Kreissl, [1]C Binder, [1]A Berger, [1]N Haiden. *[1]Neonatology Pediatric Intensive Care Medicine and Neuropediatrics, Medical University of Vienna, Vienna, Austria; [2]Radiology and Nuclear Medicine, Medical University of Vienna, Vienna, Austria; [3]Pediatrics, Wilhelminen Hospital of Vienna, Vienna, Austria*

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Background Probiotics may protect from necrotizing enterocolitis (NEC). Former studies in Asian populations have shown that Infloran® - a mixture of Lactobacillus acidophilus and Bifidobacterium infantis - decreases NEC by 80% in very low birth weight (VLBW) infants. Therefore, we implemented Infloran® at our department in 2010. The objectives of our study were to determine the influence of the probiotic Infloran® on NEC incidence,

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NEC severity and the influence of enteral nutrition in a Caucasian population compared to a historic control group.
Material and methods Since 2010, VLBW infants born
Results 230 infants were included (mean gestational age: 27+2, birth weight: 900g) and compared with 233 controls (28+5, 980g). After implementation of Infloran® NEC decreased by 32% (10.3% before vs. 7% after implementation of probiotics, p = 0.092 – corrected for confounding variables birth weight and gestational age). Probiotics had no influence on NEC severity. A NEC reduction was shown in breast fed infants only and not in formula fed infants.
Discussion The effect of Infloran® was less effective in our Caucasian population than expected. Interestingly, NEC incidence was not reduced in exclusively formula fed infants. The inefficacy in this subgroup is alarming. Therefore, the impact of enteral nutrition on probiotic effects should be explored in further prospective randomised controlled trials.

PS-182 EFFECT OF COMBINED USAGE OF PREBIOTIC OLIGOSACCHARIDES ON THE GROWTH OF BIFIDOBACTERIUM BREVE

T Ehara, H Izumi, M Tsuda, H Iwamoto, K Namba, Y Takeda. *Nutritional Science Institute, Morinaga Milk Industry Co. Ltd., Zama, Japan*

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Non-digestive oligosaccharides are often added to infant formula to help formula-fed infants develop an intestinal microbiota composed predominantly of Bifidobacteria, similar to that of breast-fed infants. Because various types of oligosaccharides exhibit specific microbial metabolism, the combined usage of oligosaccharides is considered to provide additive or synergistic effects for Bifidobacteria growth in the intestinal microbiota. The aim of this study was to evaluate the combined effect of lactulose, raffinose, and galacto-oligosaccharide (GOS) on the growth of *Bifidobacterium breve*, one of the major Bifidobacteria found in infant intestinal microbiota, using an *in vitro* mixed culture model. Seven typical bacterial species found in infant intestinal microbiota, including *B. breve*, were selected and then co-cultured under anaerobic conditions to mimic the infant intestinal environment. Each oligosaccharide was added to the medium, alone or in combination with other oligosaccharides. At all times, the total amount of added oligosaccharides composed 1% of the medium. Cells were harvested after several hours of incubation, and bacterial genomic DNA was extracted. Bacterial cell numbers were determined using quantitative realtime-PCR, with specific primers targeting the 16s rRNA genes of different bacterial groups. The combination of lactulose, raffinose, and GOS promoted the growth of *Bifidobacterium breve* compared with any single oligosaccharide or the combination of lactulose and raffinose. The combined usage of lactulose, raffinose, and GOS may provide the benefit of promoting a Bifidobacteria-predominant intestinal microbiota in formula-fed infants.

PS-183 BLOOD TRANSFUSIONS ARE NOT A RISK FACTOR FOR NECROTIZING ENTEROCOLITIS IN EXTREMELY PRETERM INFANTS

L Larsson, P Challis, C Späth, E Stoltz Sjöström, M Domellöf. *Department of Clinical Sciences, Pediatrics Umeå University Sweden, Umeå, Sweden*

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Background Transfusion practices are highly variable between hospitals and previous studies have suggested that blood transfusions may increase the risk of necrotizing enterocolitis (NEC).
Aim To explore the association between blood transfusions and incidence of NEC in extremely preterm infants.
Methods We used data from a Swedish population-based study including extremely preterm infants (<27 weeks) born between 2004–2007, (n = 602). All data on blood transfusions and haemoglobin (Hb) concentrations up to 28 days of age was collected for survivors. We performed a nested case-control study where two controls were chosen for each case of NEC (n = 21).
Results During the first 28 days of life, infants received a median (25^{th}-75^{th} percentile) of 6 (3–9) blood transfusions resulting in 75 (44–120) ml/kg of blood. Predictors for receiving a higher volume of blood transfusions were days on respiratory support (R = 0.345, p < 0.001), hospital (R = 0.339, p < 0.001), low birth weight (R = -0.236, p < 0.001) and total steroid dose (R = 0.209, p < 0.001). Hb was not a significant predictor.

Overall NEC incidence was 5.8%. There was no significant difference between NEC cases and controls in number of blood transfusions (p = 0.420), volume of blood transfused from birth to NEC diagnosis (p = 0.274), or during the 48 h preceding NEC diagnosis (p = 0.459).
Conclusions Blood transfusions were given liberally in Sweden compared to other studied populations. Morbidity related variables, especially those related to respiratory illness, were significant predictors of blood transfusion. NEC incidence was comparable with other populations but no significant association was found between blood transfusions and NEC among these extremely preterm infants.

PS-184 INTESTINAL PERMEABILITY PRECEDING NECROTISING ENTEROCOLITIS AND SEPSIS IN PRETERM INFANTS

[1]PF Fleming, [2]S Eaton, [3]M Wilks, [3]MR Millar, [1]KL Costeloe. *[1]Paediatrics, Queen Mary University of London, London, UK; [2]Institute of Child Health, University College London, London, UK; [3]Microbiology, Barts Health NHS Trust, London, UK*

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Introduction Increased intestinal permeability may precede the onset of several important diseases in preterm infants including necrotising enterocolitis (NEC) and Gram negative septicaemias.

Hypothesis that increased intestinal permeability is evident at 2 weeks of age and may precede the onset of NEC or Gram negative septicaemias.
Methods Infants <31 weeks gestation were enrolled. Intestinal permeability was assessed by the sugar absorption test (SAT) using lactulose and mannitol and gut leakage by stool alpha-1-antitrypsin (A1AT). Clinical data were prospectively collected.
Results Thirty-six infants were enrolled. The median (range) gestation was 27 weeks (24–30) and median birth weight was 900g (585–1460). Nine infants (25%) developed suspected or proven NEC (any NEC) of whom 5 (14%) developed ≥Bells Stage II NEC. Four infants (11%) developed Gram negative septicaemias. Results are compared between infants with either NEC or sepsis and those with neither.

The median (range) lactulose:mannitol ratio (L:M) for all infants was 0.38 (0.01–5.46) and median A1AT was 128 (41–1518) mg/L. There was no statistically significant difference by L:M in infants who developed any NEC (p = 0.75); ≥Bells

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