in the 21 infants with no ORT, assessed by clinical definition of oxygen at 36 weeks' GA: no alteration in treatment differences.

Abstract 171 Table 1 Outcome data

Outcome	NIPPV	nCPAP	Adjusted OR (95%CI)	p
Primary analysis: death or ORT-BPD n (%)	192/497 (38.6)	179/487 (36.8)	1.09 (0.83, 1.44)	0.53
Supporting analysis: death or imputed BPD	198/504 (39.3)	191/501 (38.1)	1.05 (0.80, 1.38)	0.72
Primary outcome by subgroup				
No intubation/Early extubation n (%)	72/241 (29.9)	72/252 (28.6)	1.1 (0.72, 1.69)	0.64
Prior intubation	120/256 (46.9)	107/235 (45.5)	1.1 (0.73, 1,54)	0.76

Conclusions In infants < 1000g NIPPV does not confer further benefit nor risk for survival free of BPD at 36 weeks' GA compared to nCPAP.

172 THE PROPREMS RANDOMISED TRIAL INVESTIGATING THE EFFECTS OF PROBIOTICS ON LATE ONSET SEPSIS IN VERY PRETERM INFANTS

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[1,2,3]SE Jacobs, [3]JM Tobin, [4]G Opie, [2]S Donath, [3]M Pirotta, [5]SN Tabrizi, [1]CJ Morley, [3,5,6]SM Garland, for the ProPrems Study Group. *[1]Neonatal Services, Royal Women's Hospital; [2]Murdoch Children's Research Institute; [3]University of Melbourne; [4]Department of Paediatrics, Mercy Hospital for Women; [5]Department of Microbiology and Infectious Diseases, Royal Women's Hospital; [6]Royal Children's Hospital, Melbourne, VIC, Australia*

Background Late onset sepsis (LOS) frequently complicates prematurity, and is associated with increased mortality and morbidity. Whilst probiotic supplementation in preterm infants reduces mortality and necrotising enterocolitis (NEC), the effect on LOS in the most vulnerable preterms is unknown.
Aim To determine the effects of probiotic supplementation in very preterm infants.
Methods A multi-centred, double-blinded, placebo-controlled, randomised controlled trial in very preterm infants born < 32 weeks' gestation weighing < 1500g, supplemented daily with either a probiotic combination (*Bifidobacterium infantis*, *Streptococcus thermophiles* and *Bifidobacterium lactis* 1 x 10^9 total organisms) or placebo (maltodextrin) from soon after commencement of enteral feeds until discharge home or term corrected age. The primary outcome was the incidence of at least one episode of definite (deep culture positive) late onset sepsis; secondary outcomes included NEC, mortality, duration of primary hospitalisation, number of courses and duration of antibiotics, etc. [Garland et al. *BMC Infectious Diseases*. 2011 Aug 4; 11(1):210].
Results Between October 2007 and November 2011, 1099 very preterm infants were randomised from 10 participating perinatal centres in Australia and New Zealand. Four interim analyses at 100, 200, 350 and 700 recruits confirmed comparable baseline characteristics between groups (for birth weight, gestation, gender, multiple pregnancy, antenatal steroids, caesarean delivery) and recommended trial continuation. Data cleaning is nearing completion prior to unblinding treatment allocation groups and analysis.
Conclusions The ProPrems trial has recruited 1099 very preterm infants; it is the largest randomised trial to date investigating the potential for probiotics to reduce the burden of prematurity.

173 CLUES FOR THE NEURODEVELOPMENTAL PROGNOSIS OF THE HIGH RISK PRETERM AND TERM NEWBORNS

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K Gucuyener. *Pediatric Neurology, Gazi University Faculty of Medicine, Ankara, Turkey*

Premature survivors are at increased risk for impaired neurodevelopmental outcome compared to full terms. These sequelae include cognitive abnormalities, mild fine or gross motor delay, cerebral palsy, vision and hearing losses, impairment increases with decreasing gestational age. Persistence of multiple abnormal neurologic signs in the first 12 to 18 months is ominous. Emergence of other findings (vision impairments, seizures, feeding issues delay of head growth) is associated with poor outcome. MRI is useful in predicting neurodevelopmental outcome at the equivalent of term gestation. Other neonatal complications as; bronchopulmonary dysplasia, necrotizing enterocolitis, retinopathy of prematurity, intraventricular hemorrhage, poor growth, presence of congenital anomalies are associated with an increased risk of poor neurodevelopmental outcome. Premature survivors are more likely to have specific psychological and behavioral problems including attention deficit hyperactivity syndrome, general anxiety, and depression. Individuals with birth weights below 1500 g are at greater risk for poor academic performance than those born with normal birthweight because of their impaired cognition, neurosensory defects, and behavioral and psychological problems. Neurodevelopmental outcome is assessed more accurately at school age than in early childhood due to the cognitive recovery over time and lack of accurate predictive assessment tools in early childhood.

Survivors of prematures need to be assessed for neurodevelopmental impairment and, if impairment is present, be referred to educational programs and subspecialty care in order to provide the best possible outcome. ELBW infants without evidence of significant neonatal brain injury can recover when exposed to a nurturing home environment and comprehensive early intervention services.

174 OXYTOCIN, VASOPRESSIN AND SOCIAL BONDING: IMPLICATIONS FOR NOVEL THERAPIES FOR AUTISM

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L Young. *Center for Translational Social Neuroscience, Emory University, Atlanta, GA, USA*

The neuropeptides oxytocin and vasopressin play important roles in several aspects of social cognition and behavior in animal models, including social recognition, maternal nurturing and social bonding. Several studies suggest that these neuropeptides increase the saliency of social stimuli, enhancing the neural processing of social cues. A series of studies in voles demonstrate that variation in oxytocin and vasopressin receptor systems contributes to both species differences and individual variation in social behavior. Oxytocin and vasopressin receptor activation in the mesolimbic dopamine reward pathway plays an important role in social bond formation. We have identified genetic polymorphisms that robustly predict neuropeptide receptor expression in the brain, which in turn predicts social behaviors, including susceptibility to the impact of early social stressors on later life social attachment. There are remarkable parallels between those studies in voles and recent studies in humans which suggest that these mechanisms are highly conserved from rodent to man. In humans, intranasal delivery of oxytocin enhances eye gaze into the eyes of other, the ability to infer the emotions of others from facial cues, empathy, and socially reinforced learning. These observations suggest that the oxytocin system may be a viable target for novel pharmacological strategies for improving social cognition in autism spectrum disorders. Drugs that stimulate endogenous oxytocin release may be useful as an adjunct therapy for behavioral interventions for autism.

175 MATERNAL DIET AND TYPE 2 DIABETES IN THE OFFSPRING

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S Ozanne. *University of Cambridge, Cambridge, UK*

It is over twenty years since epidemiological studies revealed that there was a relationship between patterns of early growth and risk of developing type 2 diabetes in later life. Studies of identical twins, individuals who were *in utero* during periods of famine and animal models have provided strong evidence that the early environment, including early nutrition, plays an important role in mediating this relationship. The concept of "early life programming" is therefore widely accepted. However the mechanisms by which a phenomenon that occurs in early life can have long-term effects on the function of a cell and therefore metabolism of an organism many years later are still emerging.

These include:

1. Permanent structural changes in an organ due to exposure to suboptimal levels of essential hormones or nutrients.
2. Permanent effects on regulation of cellular ageing through increases in oxidative stress and mitochondrial dysfunction leading to DNA damage and telomere shortening.
3. Persistent alterations in epigenetic modifications (including DNA methylation, histone modifications and miRNAs) leading to changes in gene expression.

Several transcription factors have been shown to be susceptible to programmed changes in gene expression through such epigenetic mechanisms. These are conceptually attractive targets of programmed epigenetic regulation, as through regulation of their expression a network of other genes will be regulated. Further understanding of the extent and nature of these programming mechanisms could enable the development of preventative and intervention strategies to combat the burden of diseases such as type 2 diabetes.

176 THE ROLE OF FGF10 FOR ALVEOGENESIS IN BRONCHOPULMONARY DYSPLASIA

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[1]CM Chao, [2]D Al Alam, [3]C Tiozzo, [4]R [5]Virender, S Bellusci. *[1]Department of Pediatrics, Excellence Cluster in Cardio-Pulmonary Systems (ECCPS), University of Gießen, Giessen, Germany; [2]Developmental Biology and Regenerative Medicine Program, Saban Research Institute of Children's Hospital; [3]Developmental Biology Program, Division of Surgery, Saban Research Institute of Children's Hospital, Los Angeles; [4]Department of Pediatrics, Los Angeles Biomedical Research Institute at Harbor-UCLA Medical Center, Torrance, CA, USA; [5]Department of Internal Medicine II, Excellence Cluster in Cardio-Pulmonary Systems (ECCPS), University of Gießen, Giessen, Germany*

Background and aim Bronchopulmonary dysplasia (BPD) is associated with impaired alveolar growth and pathologic vascularization. As a chronic lung disease it remains an important complication for preterm infants, especially born before 28th week of gestational age. *Fibroblast-growth-factor 10* (*Fgf10*) is known to play an important role in lung morphogenesis. We aim to investigate the role of *Fgf10* for alveogenesis in a mouse model of BPD.

Methods Using an inducible double transgenic mouse line (*SPC-rtTA; tet(O)Fgf10*) we established a BPD model by exposing the pups to 85% oxygen (experimental and control group) and normoxia (control group) for 28 days. Activation of the transgene *Fgf10* was done after birth (P0) by doxycycline treatment. Gene expressions for *Fgfr2b* and *Fgf10* were analyzed by quantitative real-time PCR. To study lung morphology histology, mean linear intercept (MLI) and radial alveolar count (RAC) were performed.

Results Real-time PCR results showed a significant decrease of *Fgfr2b* and *Fgf10* expression in the hyperoxia group at day 21 and day 28 indicating epithelial cell damages. The histology showed a simplification of alveoli in the hyperoxia group (85% oxygen) but not in the normoxia group after 14 days. In contrast, the hyperoxia group with overexpression of *Fgf10* showed less simplification of alveoli. These findings were confirmed by MLI and RAC.

Conclusion We conclude that *Fgf10* may have a protective/regenerative effect on lung injury by increasing secondary septa formation.

177 AUTOMATION OF RESPIRATORY SUPPORT IN THE NEONATE: FACT OR FICTION

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E Bancalari. *Pediatrics/Neonatology, University of Miami Miller School of Medicine, Miami, FL, USA*

Premature infants frequently present with respiratory instability that is associated with fluctuations in ventilation and gas exchange. Frequent adjustments of respiratory support to match the infant's needs are time consuming and are limited by staff availability and workload. Hence, automation is being developed as a way of improving the care of the premature infants and reduce staff workload.

Some of these automated modes of respiratory support are becoming available for clinical use in preterm infants. These include volume targeted ventilation where peak inspiratory pressure is automatically and continuously adjusted to deliver a preset tidal volume. Another modality is targeted minute ventilation where the ventilator rate is adjusted automatically to maintain a preset minute ventilation. Proportional assist ventilation is another modality where airway pressure is adjusted in proportion to flow or tidal volume generated by the infant. Using this principle recently NAVA has been introduced for use in neonates where the airway pressure generated by the ventilator is proportional to the electrical signal captured from the diaphragm. Finally, automated adjustment of inspired oxygen concentration is becoming available in some ventilators to adjust FiO2 and maintain oxygen saturation within a preset range. These modes are expected to compensate for some of the limitations that exist in the present forms of respiratory support. Available evidence and preliminary findings for short term effects are promising but further investigation is needed to determine the effects of these modalities on the long term outcome of preterm infants.

178 CIRCUMSTANCES SURROUNDING END OF LIFE OF INFANTS WITH PERINATAL HYPOXIC-ISCHEMIC ENCEPHALOPATHY (HIE)

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[1]A Garcia-Alix, [2]J Arnaez, [1]V Cortes, [3]G Arca, [1]N Herranz, [4]F Gaya, [5]A Balaguer. *[1]Division of Neonatology, Sant Joan de Deu Hospital. University of Barcelona, Esplugues de Llobregat; [2]Division of Neonatology, Hospital Universitario Burgos, Burgos; [3]Division of Neonatology, Hospital Clinic-Maternitat, Barcelona; [4]Division of Bioestatistics, Hospital Universitario La Paz, Madrid; [5]Pediatrics, International University of Barcelona, Barcelona, Spain*

Objective To analyze circumstances of all consecutive neonatal deaths by HIE over a 10 year period and examine changes along timeSetting. Level III Neonatal Intensive Care. Madrid, Spain.

Design Retrospective chart review of all neonatal cases with HIE who died from 2000 to 2010 within the neonatal period.

Results Of a total 70 infants with HIE, 18 died during the neonatal period. All of them had severe HIE and the mean age of death was 64.4±51 hours of life. In 17 (94%) the death was preceded by an end-of-life decision based on the bad prognosis; 15 by withdrawal or limitation of therapy (W/LT) while ventilated, and 2 by decision of parents not to resuscitate if cardiac arrest. All patients had coma and at least one of the following studies severely altered: EEG-aEEG, US/Doppler or CSF-NSE. The first interview for W/LT happened at 25.7±28.9 hours and the mean time interval since W/LT was iniciated until death was 10.5±14 hours. Ten infants (56%) had sedation or analgesia during W/LT and presence of the family at the bedside