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IMPACT OF FAMILY STRUCTURE AND STABILITY ON DEVELOPMENTAL OUTCOME IN PRETERM INFANTS. Steven J. Gross and Barbara B. Mettelman, Departments of Pediatrics and Psychiatry, SUNY Health Science Center, Syracuse, New York, USA.

The impact of family structure and stability on developmental outcome was assessed in a 7 year prospective study of 121 of 125 surviving infants < 32 weeks' gestation (born 7/1/85 to 6/30/86) and 125 demographically matched term infants. Five preterm and four term children experienced the death of a parent. At 7 years, 66 (55%) preterm and 71 (59%) term children live with 2 parents (group I); 12 (10%) preterm and 13 (11%) term children live with 1 parent and have regular contact with the other parent (group II); 36 (30%) preterm and 34 (28%) term children live with a single parent and have no regular contact with the other parent (group III); and 7 (6%) preterm and 2 (2%) term children live in foster care (group IV). The preterm groups I-IV did not differ for gestational age (28.5 ± 2.1, 27.3 ± 2.4, 28.4 ± 1.9 and 27.1 ± 1.3 wk, respectively), birthweight (1187 ± 346, 1068 ± 394, 1208 ± 338, and 1019 ± 252 g) or NICU morbidities including mechanical ventilation, IVH or duration of hospitalization. Cognitive ability (McCarthy GCI) was significantly related to family structure in both preterm (groups I-IV: 96 ± 13, 90 ± 19, 87 ± 16, and 77 ± 15, respectively, $p < .001$) and term children (106 ± 13, 103 ± 12, 96 ± 12 and 81 ± 25, respectively, $p < .001$). One or more changes in family structure (marriage, divorce, custody) were more common in preterm (47%) than in term children (28%) ($p < .01$) and also were related to decreased I.Q. in preterm children (no change, 95 ± 14; single change, 93 ± 13; multiple changes, 80 ± 17, $p < .001$). Additionally, ≥ 4 family moves occurred twice as often among preterm (30%) than among term children (17%) and was associated with poorer cognitive outcome in both groups (preterm children: 85 ± 16 vs 95 ± 14, $p < .01$; term children: 96 ± 14 vs 104 ± 14, $p < .05$). Parents' reports of problematic behaviors (Child Behavior Checklist) were greatest for preterm children raised by single parents ($p < .005$), those with changes in family structure ($p < .01$) and preterm children with multiple moves ($p < .05$). Changes in family structure and stability occur more often for preterm than term children and impact significantly on their developmental outcome.

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PROSPECTIVE RANDOMIZED CONTROLLED TRIAL OF CONVENTIONAL TREATMENT OR TRANSPORT FOR ECMO IN INFANTS WITH SEVERE PERSISTENT PULMONARY HYPERTENSION (PPHN): TWO YEAR FOLLOW UP. Steven J. Gross, Ellen M. Bitano, Diane B. D'Eugenio, David O. Hakanson, and Robert V. Hingre, Dept of Pediatrics, SUNY Health Science Center, Syracuse, New York, USA.

28 of 31 ECMO eligible infants born July, 1988 to March, 1992 with severe PPHN were assigned randomly when oxygenation index (OI) was ≥ 40 for four hours to be transported for ECMO (n=15, birthweight 3601 ± 622 g; OI 63 ± 28) or to receive conventional therapy at our center (n=13, birthweight 3403 ± 540 g; OI 60 ± 28). Fourteen of the 15 infants (93%) transported for ECMO survived to hospital discharge (including 3 who did not receive ECMO), while 7 of 13 (54%) conventionally treated infants survived ($p < .05$). One ECMO infant died after hospital discharge at age 3 months of SIDS. Outcome for the survivors (mean ± SD):

	ECMO(N=13)	CONVENTIONAL(N=7)	p
Ventilation(d)	13 ± 8	10 ± 6	NS
Hospitalization(d)	34 ± 13	35 ± 20	NS
FIO ₂ >.21 at 30 days(%)	6 (46%)	4 (57%)	NS
Neurologic Abnormality	1 (8%)	1 (14%)	NS
Microcephaly (<5%)	3 (23%)	0	NS
Bayley MDI at 2 years	90 ± 27	87 ± 23	NS
MDI <84	4 (31%)	4 (57%)	NS
Bayley PDI at 2 years	87 ± 22	92 ± 23	NS
PDI <84	5 (38%)	1 (14%)	NS

ECMO salvaged sicker neonates (mean OI at study entry for ECMO survivors was 60 ± 21 vs 44 ± 5 for conventionally treated survivors); nevertheless, transport for ECMO was not associated with worse neurodevelopmental outcome at 2 years. These data support the use of ECMO in term infants with severe respiratory distress.

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VARIABLES INFLUENCING THE LEVEL OF PLASMA LACTATE
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It has been suggested that plasma lactate (L) as an indicator of hypoxemia may identify serious anaemia requiring transfusion. One might expect anaemia to exacerbate the effect of hypoxemia with increased L resulting. The influence of haemoglobin (Hb) (range:3.2-9.6 g/100ml), glucose, weight, P_aO₂ and blood pressure on L (range:2.4-9.3 mmol/l) was studied in 31 piglets aged 12-60h. The animals were anaesthetised with halothane, intubated and sampled under stable conditions. 17 of the animals were sampled again after a period of severe hypoxemia (median P_aO₂=3.3kPa). Regression analysis were performed showing Hb to be the best predictor of L at base line conditions. (log L=1.1-0.1Hb $p=0.0001$ Adj.R²=0.5). Hb did not however influence the amount of increase in L (ΔL) (range:10.6-28.9) during severe hypoxia. None of the recorded variables alone or in combinations were able to predict ΔL with $p < 0.05$.

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PRECEREBRAL AND CEREBRAL VESSEL ANATOMY IN THE PIG
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The anatomy of the precerebral and cerebral vessels are not identical in humans and pigs. Vessel anatomy in newborn pigs were studied by dissection and angiography. It is possible by ligation of the external carotid, occipital and condylic artery to transform the common carotid into a precerebral artery for continuous measurements of cerebral blood flow. The pig has a large rete mirabilis between the internal carotid and the Circle of Willis. We found by selective angiography in either the vertebral, internal or external carotid 1) good flow to the contralateral hemisphere, 2) some flow between the extra- and intracerebral arteries. These findings of well developed vessel communication may explain that it is not possible to produce a focal ischemic brain damage in the piglet.

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PAROXYSMAL EVENTS RELATED TO INCREASED VAGAL REACTIVITY IN HEALTHY CHILDREN.

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"Breath-holding spells" and "reflex anoxic seizures" in children are sometimes misdiagnosed as epilepsy. Paroxysmal events may however be vagally-mediated. Initiation of the vagal reflex follows usually a sudden and unexpected fright or pain. The purpose of this study was to evaluate the strength of the vagal reflexes in children with various forms of paroxysmal events. **Subjects and methods:** 57 infants, aged 5 months to 5 years, with a history of at least two episodes on non-epileptic paroxysmal events were retained for this study. Great care was provided in the parental history. Based on anamnestic data, each subject was assigned to a group. Group I: Blue breath-holding spells (BBHS=18); Group II: Reflex anoxic seizures (RAS=17); Group III: Sobbing spasms (SS=14); Group IV: Mixed spasms (MS=8). An ocular compression test (OCT) was performed according to previously described technique (Ramet Ped Res 1988). Following parameters were measured: control RR interval; longest RR interval; vagal escape: % RR (= longest RR interval / control RR interval) x 100. **Results:** - The highest values for the longest RR obtained in the RAS group, differed significantly from those obtained in the BBHS group. - The mean and SD values for % RR were respectively for groups I, II, III and IV 354 ± 207 %, 601 ± 164%, 524 ± 256% and 611 ± 260%. % RR was significantly higher in the RAS group than in the BBHS group. Quite unexpectedly, we found that the % RR in the SS and in the mixed groups were significantly higher than in the BBHS. We can assume that the clear-cut dissociation between "vagal-mediated" RAS and "vagal-independent" BBHS seems incorrect. However, we demonstrated that vagal reactivity plays a certain role in SS. Our results sustain the importance of performing an O.C.T. not only in RAS but also in BBHS and SS as well as in the MS group. The classical description between "blue" and "white breath holding spells" depending on the absence or presence of an increased vagal reactivity is, according to our present data, no longer fully applicable.

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STANDARDISATION OF THE HERING-BREUER DEFLATIONARY REFLEX
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We have recently reported that the forced partial expiratory flow volume technique induces the Hering-Breuer deflationary reflex in infants. The factors responsible for initiating this reflex in man have never been documented. We investigated the effects of altering the peak and rate of rise of jacket pressure and of inflating the jacket at different times in the respiratory cycle on the strength of the reflex. Reflex strength was determined by the rate of fall of oesophageal pressure post jacket inflation. 28 healthy newborn infants were studied using a 'Hammersmith' jacket and pneumotachograph/reverse plethysmograph system. There was a significant relationship between peak oesophageal pressure, reduction in oesophageal pressure post inflation, rate of inflation of jacket and the reflex strength ($p < 0.001$). However, there was no relationship between the position in the respiratory cycle of jacket inflation and reflex strength. The reflex was most reproducible, occurring 0.12-0.16 seconds after onset of inflation, when the jacket inflation pressure was at least 30cms H₂O, the rate of rise of the jacket was less than 0.2 seconds and inflation commenced around end inspiration. We recommend that these conditions are used to standardise the Hering-Breuer deflationary reflex.