

†1687 PERMANENT LIGATION OF THE RIGHT COMMON CAROTID ARTERY AT BIRTH: 18 CASES. Ira T. Lott, Barbara H. Towne, David M. McPherson, Timothy Healey, Univ Calif Irvine Medical School, Department of Pediatrics and Neurology.

Extra corporeal membrane oxygenation (ECMO) is a heart-lung bypass procedure which involves permanent ligation of the right common carotid artery and internal jugular vein. 18 children who received ECMO as neonates for severe cardiorespiratory insufficiency were studied neurologically 4-11 years after treatment. Cognitive and/or language impairments were noted in 5/18 whereas 72% had a normal neurodevelopmental status. Spastic motor impairment was mild in 3 and severe in 2 patients. Five children had paroxysmal discharges on the EEG but lateralizing findings were not seen in any child. In 10/11 patients studied by noninvasive carotid evaluation, the arterial occlusion could be identified by ultrasound. In these cases the internal carotid artery (ICA) was patent and forward flow in the ICA was achieved by retrograde channeling through the external carotid artery. The size and volume of flow in the right ICA was approximately 50% of that in the left. Asymmetrical auditory cortical evoked potentials were seen in 60% of the 12 cases studied to date with right sided preponderance in the majority. These preliminary findings suggest a possible subclinical effect upon right hemispherical function ipsilateral to the arterial ligation. We conclude that: 1) collateral retrograde flow is established after right common carotid artery ligation at birth and 2) in the majority of patients there are no apparent specific clinical symptoms of right hemispherical dysfunction following the ECMO procedure.

1688 DEVELOPMENTAL SIGNIFICANCE OF SCAPULAR RETRACTIONS IN THE LOW BIRTHWEIGHT INFANT.

S. Malin, A. Daft, M. Hoffman-Williamson, J. Bernbaum, (Spon. by W.W. Fox). Univ. of Pa. Sch. of Med., Dept. of Peds., Children's Hosp. of Phila., Phila., PA.

Although abnormal muscle tone is frequently noted in the premature infant, it is usually transient and resolves by 18 months of age. When present in preterm infants, these abnormalities do not carry the same prognostic importance as do similar abnormalities in the term infant. Scapular retractions (SR) are clinical evidence of increased shoulder girdle tone. Because the resulting "high guard" position of the arms in the infant with SR may interfere with the acquisition of developmental milestones such as midline play, transferring, rolling over and sitting, we evaluated 78 former NICU patients for the presence of SR. 25 infants (33%) developed SR by 6 months either as a component of generalized hypertonia or as compensation for truncal hypotonia. All infants received physical therapy or home exercise programs directed at these neuromuscular abnormalities. SR resolved in all patients by 18 months; only 3 (4%) had SR at 12 months. Bayley developmental scores were compared at 6, 12 and 18 months.

	6 mos: MDI/PDI	12 mos: MDI/PDI	18 mos: MDI/PDI
No SR	92 ± 14/93 ± 14	97 ± 11/92 ± 15	94 ± 10/92 ± 14
SR	82 ± 16/82 ± 22	96 ± 11/90 ± 18	95 ± 14/86 ± 15
p	<.01 4.02	NS NS	NS NS

Conclusions: Scapular retractions are common, but resolve by 12 months in most preterm infants. SR interfere with performance at 6 months, but as SR resolve, no lasting effects on development are seen. Physical therapy or exercises may help to promote resolution of this relatively common abnormality in preterm infants.

1689 EFFECTS OF IONIZING RADIATION ON MYELIN SYNTHESIS IN THE DEVELOPING BRAIN. William Maniscalco, Andrea Jacobs, Leonard Golub, and Jacob Finkelstein.

University of Rochester School of Medicine, Strong Memorial Hospital, Department of Pediatrics, Rochester, NY.

Therapeutic radiation to the central nervous system may result in acute encephalopathy and necrosis. To study the effects of radiation on the developing brain, we measured myelin synthesis following radiation *in vivo* and *in vitro*. For *in vivo* studies, 5 day old rat pups received whole head radiation of 0, 500 or 1500 rads. At 19 days of age, the time of maximal myelin synthesis, radiolabeled S₀₄ incorporation into brain sulfatides was used as an index of myelin synthesis. Compared to controls, S₀₄ incorporation was reduced 40% and 60% in animals that received 500 and 1500 rads respectively. To determine that the radiation influenced the cells of the CNS, we prepared rotation-mediated reaggregate cultures from 16 day fetal rat brains. These cultures contain both neuronal and glial elements and have a rapid increase in S₀₄ incorporation starting at 16 days in culture (DIC). Irradiation of the reaggregate cultures (0, 250, 500, 1000 and 1500 rads) at 12 DIC produced a dose dependent decrease in S₀₄ incorporation at 21 DIC. By 28 DIC the cultures exposed to 250 and 500 rads were similar to controls, while the 1000 and 1500 rad cultures continued to be depressed. There was no effect of radiation on leucine incorporation into protein or on the morphology of the reaggregates. These studies demonstrate that radiation exposure prior to the onset of maximal myelin synthesis results in a delay or decrease of myelin production. The effect is due to a primary effect of radiation on brain cells. (Supported by NCI 2-P01CA11051-15A1).

●1690 DIRECT MEASUREMENT OF LOCAL CEREBRAL BLOOD FLOW (ICBF) IN THE GREYHOUND: Possible Relationship to Intraventricular Hemorrhage in the Newborn.

KH Manwaring, TJ Tarby, HW Pittman, and WJ Daily, Barrow Neurological Institute, Phoenix, Arizona

The pathogenesis of neonatal periventricular-intraventricular hemorrhage (PVH-IVH) remains unclear, although an aberration in cerebral hemodynamics imposed upon prematurity appears fundamental. Microthermistors were implanted in the cerebral cortex of 17 adult greyhounds. An analog-digital hybrid system developed using the IBM PC computer to provide simultaneous continuous LCBF data at four discrete sites. Variables of peak inspiratory pressure (PIP), positive and expiratory pressure (PEEP), total minute ventilation and pulse pressure were investigated through a 1 mm burr hole as well as 2 cm craniotomy to compare cranial compliance effects.

Positive pressure ventilation induces a fluctuating pattern of LCBF with blood flow lowest during peak inspiration. A large craniotomy defect (simulating the open fontanel), high PIP or high PEEP accentuate this effect.

The use of a small burr hole to simulate a closed fontanel results in the obliteration of the fluctuating pattern and the enhancement of beat-to-beat changes in LCBF that were directly proportional to pulse pressure.

These data suggest that hemodynamic changes produce fluctuations in local tissue perfusion which are dependent upon cranial compliance. The exact relation of such changes to the pathogenesis of PVH-IVH requires continuous LCBF measurement in the subependymal zone in the human newborn or an animal model.

1691 ASSOCIATION OF CEREBRAL PROSTAGLANDIN IMBALANCE WITH PERINATAL STROKE. Laura R. Ment, Charles C. Duncan, William B. Stewart, Bruce Pitt, Judy Cole, (Spon. by H.A. Pearson) Yale Univ Sch Med, Depts Ped, Neurosurg, Anat, Anesth, New Haven

Asphyxia, with its attendant hypotension, is the most common cause for neonatal cerebral infarction. We have demonstrated uncoupling of cerebral blood flow & metabolism in a hemorrhagic hypotension (HH) model for cerebral infarction in the newborn beagle pup. We report the effects of HH on regional cerebral prostaglandin (PG) levels in newborn beagle pups exposed to a similar insult. Pups were randomized to (HH) or no insult (C). HH was induced by slow venous hemorrhage to maintain MABP 20-30 mm Hg. Fifteen minutes following HH/C, the animals underwent *in vivo* freezing of brain. PG determinations for 6-keto PGF_{1α}, the stable metabolite of PGI₂, TXB₂, the stable breakdown product of TXA₂, & PGE₂ were performed using radioimmunoassays. MABP of HH group was 74 prior to & 26 mm Hg following insult; the MABP of the C group remained 71 mm Hg. The PG levels & ratios of 6-ketoPGF_{1α}/TXB₂ (ratio) were as follows:

	PROSTAGLANDINS (pg/mg)							
	GRAY		WHITE					
	PGE ₂	6ketoPGF _{1α} /TXB ₂ ratio	PGE ₂	6ketoPGF _{1α} /TXB ₂ ratio				
C	103	228	220	1.03	54	147	125	1.18
HH	267	59	134	0.44	114	90	92	0.98

The alterations in the cerebral PGI₂/TXA₂ balance may in part be responsible for the changes found in cerebral blood flow & metabolism & the neuropathological consequences of perinatal ischemia.

1692 AMYGDALA DYSFUNCTION IN AUTISM. Patricia Merjanian, Ira T. Lott, and Lynn Nadel, Univ CA Irvine Medical School, Department of Pediatrics, Irvine, CA.

The anatomic site responsible for infantile autism is unknown. Based upon converging neuropsychological/neuropathological evidence that the temporal lobe may be the primary site of dysfunction in autism, we have adapted discrimination and memory tasks that distinguish amygdalar from hippocampal damage in monkeys (Murray/Mishkin 1982). This neuropsychological paradigm was applied to 18 autistic subjects matched very closely to 18 Down's syndrome (DS) controls on the basis of age, sex and scores on the Raven Progressive Matrices. A subject was considered autistic when he/she achieved a score within 1 SD of the mean for the autistic subgroup of a 2,000 subject standardization sample (Autism Behavior Checklist, ABC). On a delayed nonmatching-to-sample task (DNMTS) cross-modal scores correlated with ABC body and object use ($r = -0.42$, $p < 0.05$) and cross-modal with ABC social and self-help skills ($r = -.45$, $p < 0.05$). These correlation scales contain several items in common with the Kluver-Bucy syndrome, a neurobehavioral abnormality in animals and humans associated with damage to the amygdala. On the visual DNMTS, a significant group x task interaction was found ($F = 6.68$, $DF = 2, 34$, $p < .01$) indicating that DS performed better than autistics. Impairment of the visual DNMTS in monkeys results from lesions in both the amygdala and the hippocampus. There were no significant differences observed between the two groups on the spatial location tasks reflective of the hippocampal lesions alone. Taken together, these results suggest a disproportionate functional impairment of the amygdala in autism.