1690 CONCORDANCE OF BRAINSTEM AUDITORY EVOKED RESPONSE (BAER) WITH BRAIN ULTRASOUND ABNORMALITIES. Bernard Z. Karmel, Edwin G. Brown, Rosario Zappulla, Joan Goodman, and Aarti Raut, The Mount Sinai School of Medicine, Department of Pediatrics, New York, New York.

Useful information derived from BAER waveforms include: a) presence or absence of waveform components, b) latency, and c) latency intervals between components (especially Waves I, III, and V). BAER analyses using click intensities 75dB above adult thresholds recorded ipsilaterally were obtained from 41 neonates (≥30 weeks' gestation) suspected of hypoxic brain injury. Also, an ultrasound scan was done near the time BAER tests were performed. Of 14 infants who showed absence of a reliable waveform, 12 had evidence of brain hemorrhage by ultrasound. In 27 infants, Waves I, III, and V were reliably detected. A linear discriminant function based on Wave I latency and the III-V latency interval was constructed that reliably predicted 85% (23) of the sonographic results. Thus, we found BAER analyses to be highly concordant with sonography (X^2 = 20.5, p <0.001). Birthweight and gestational age did not significantly enter into the discriminant equation. Return of the BAER response toward normal followed resolution of the hemorrhage observed by ultrasound. These data indicate that acute structural brain damage due to hemorrhage is associated frequently with acute functional abnormalities measured by BAER; both appear to resolve together. However, the importance of these findings to predict further chronic neurologic abnormalities remains to be determined.

1691 ULTRA-LIGHT EARPHONES IMPROVE NEONATAL BRAINSTEM AUDITORY EVOKED RESPONSE (BAER) TESTING. Bernard Z. Karmel and Edwin G. Brown, Division of Neonatology, Mount Sinai School of Medicine, Department of Pediatrics, New York, New York.

Detection of BAER waveforms in the neonatal ICU is hampered by the large size of the typical "pediatric earphone" normally used (TDH-39). Earphone size prevents adequate stability of sound intensity under all ICU conditions without disrupting or handling the infant during a BAER test. Also, large speaker coils must operate at higher currents; this induces stimulus artifacts which distort the cochlear microphonic and the auditory nerve response components (CM and Wave I). This is especially true at the intensities needed to test infants. We found that essentially the same BAER waveform, without significant stimulus artifacts, is produced using miniture ultra-lightweight earphones made with samarium cobalt magnets (<0.2 oz.) (Sony or Recoton). To insure reproducibility of click intensity, the earphone was mounted in a standard feeding nipple that had cotton stuffed loosely in the nipple stem. An "acoustic chamber" formed by the application of micropore tape placed around the nipple flange permitted the earphone to rest lightly over the external auditory canal without introducing mechanical distortions. These methods allowed us to test reliably all infants in isolettes, head boxes and on ventilators without the need to handle the infant excessively during data acquisition. We believe that these simple and inexpensive earphones significantly improve results obtained from BAER tests performed in the Neonatal ICU.

†**1692** ULTRASTRUCTURAL EFFECTS OF L-CARNITINE, OCTANOYLCARNITINE AND OCTANOATE ON CHOROID PLEXUS. Chung S. Kim, Dell R. Dorgan and Charles R. Roe, Biol. Sci. Res. Ctr., Neurology, Dent. Res. Ctr., Univ. of N.C., Chapel Hill and Dept. Ped., Duke Med. Ctr., Durham, N.C.

Electron micrograph of rabbit choroid plexus of the 4th ventricle incubated for 60 min. in control artificial CSF shows the apical surface of the cuboidal cells is lined by polypoid microvilli. The cytoplasm contains ribosomes and some channels of rough-surfaced endoplasmic reticulum. The mitochondria are numerous. They contain closely packed transverse cristae and some dense granules in their matrix. In contrast, there was extensive ultrastructural damage to choroid plexus incubated for 60 min. in the medium containing either 0.1mM or 1.0mM octanoate. Octanoate produced cytoplasmic swelling, accumulation of fatty acid droplets, endoplasmic reticulum was randomly dispersed, and most striking was the extent of mitochondrial swelling and disruption of cristae. Additional damage was seen in the microvilli and increased collagen deposition was noted compared to control. The higher concentration of octanoate produced even more disruption of mitochondria. Octanoylcarnitine and L-carnitine produced little alteration of ultrastructure compared to octanoate. The absence of ultrastructural impairment with octanoylcarnitine suggests a role for L-carnitine in protecting the CNS through formation of the non-toxic acylcarnitines in metabolic disorders characterized by accumulation of encephalopathic metabolites. Supported in part by USPHS grant HD03110.

1693 CRANIAL ULTRASOUND PREDICTS SHORT-TERM OUTCOME IN VLBW INFANTS. Arthur Kopelman, Steve Engelke, John Wimmer, Grant Somes, Rita Saldanha, Tom Louis (Spon. by W. Laupus). East Carolina Univ Med Sch, Pitt Cnty Meml Hosp, Dept of Peds, Greenville NC

In a prospective study of factors which may predict neurologic outcome in VLBW infants, complete observations were collected on 84 preterm infants of < 32 weeks gestation. Cranial ultrasound (US.) was performed on days 1 and 3. The studies on day 3 better predicted outcome and will be described.

US. were scored as "Normal" (normal, suspect, or mild ICH) or "Severe" (IVH with dilated ventricles or parenchymal blood). US. scores were compared with: neurologic status in the first week, occurence of seizures, development of hydrocephalus, discharge neurologic status, and mortality.

Mean B.Wt. was 1229 gm, and mean GA was 30.3 weeks. 73 infants had "Normal" US., and 11 had "Severe" US. "Severe" US. correlated with low B.Wt. (p<.01), and low 5 minute Apgar score (p≤.005), but not with GA or 1 minute Apgar score.

US. did not correlate with development of hydrocephalus, or abnormal discharge neurologic status. The following outcomes correlated with day 3 US.:

	Abnl. Neuro. (wk. 1)	Seizures	Mortality
"Normal" US.	19% (14/73)	10% (7/73)	3% (2/73)
"Severe" US.	55% (6/11)	45% (5/11)	36% (4/11)
Chi Square	$p \leq .05$	$p \leq .01$	$p \leq .001$

The infants are being followed to evaluate whether US. predicts long-term neurologic outcome.

1694 PATTERN OF CEREBRAL REPERFUSION FOLLOWING BRAIN ISCHEMIA. Abbot R. Laptook, A. Michael Porter, and Jan Peterson (Spon. by Charles R. Rosenfeld), Southwestern Med. Sch., Dept. of Pediatrics, Dallas, Texas.

Systemic hypotension in adults results in hypoxic-ischemic injury to the brain, which may be exacerbated by the post-ischemic pattern of cerebral reperfusion. Therefore, we studied cerebral O_2 delivery (OD), uptake ($CMRO_2$), and extraction (OE) following hemorrhagic, transient global ischemia in 12 ventilated newborn piglets. We measured cerebral blood flow (CBF) and cardiac output (CO) with microspheres and arteriovenous differences of O_2 content and blood gases during control (C), after 15 min of ischemia, and 10 and 90 min after rapid reperfusion (R) with whole blood. Perfusion pressure (mmHg) fell from 81±2 (X̄±SE) to 31±2* during ischemia, and was 80±3 and 77±2 after R. Hemodynamic and metabolic data are:

	C	ISCHEMIA	R-10 MIN	R-90 MIN
CBF(ml/min·100g)	98±8	41±8*	131±15*	83±11
OD(ml/min·100g)	9.9±.5	3.4±.8*	10.8±.9	7.4±.7*
$CMRO_2$(ml/min·100g)	5.8±.3	2.7±.5*	3.0±.3*	4.7±.4*
OE	.59±.03	.86±.02*	.30±.03*	.65±.03

Percent of CO to the brain was similar during C and R. A fall in OE during R-10 min led to cerebral venous hyperoxia, whereas a lower O_2 content at R-90 min led to decreased OD. We conclude that after brain ischemia: 1) R-10 min results in cerebral hyperemia, OD comparable to C but a reduced $CMRO_2$, and 2) although both OD and $CMRO_2$ are reduced at R-90 min, OE is similar to C, demonstrating reestablishment of a match between OD and $CMRO_2$. (*p<.05 vs. control).

1695 THE RELIABILITY OF AUDITORY BRAINSTEM EVOKED RESPONSES IN HUMANS. Robert E. Lasky and Melissa Waller, (Spon. by C.R. Rosenfeld), Southwestern Med. Sch., Dept. Peds., Dallas, Texas.

Recently researchers have reported a lack of prediction of newborn auditory brainstem evoked responses (ABER's) assessment to later hearing performance which may be traced, in part, to lack of reliability of the ABER in the newborn period. We recorded 2 ABER's to each of 3 stimuli in 4 groups of subjects (n=10 in each group). One group consisted of adults; the other 3 were newborns - 32,36, and 40 weeks conceptional age at the time of testing. Each record was scored independently and blindly by 2 individuals experienced in ABER recording. The reliability of the waveforms differed as a function of the wave (Wave V was most reliably scored, I the least), age of the subject (especially for the softest stimulus, the younger the subject the less reliable the waveforms), and the stimulus (the slow, loud stimulus elicited the most reliable waveforms; the soft stimulus, the least). Poor intra- and inter-scorer and test re-test reliabilities for waveforms elicited by the softest stimulus suggest difficulty in wave identification. For the loud stimuli, intra- and inter-scorer reliabilities were acceptably high suggesting that true variability in the subject's response accounted for the lack of reproducibility.