1392 VENTILATORY RESPONSES TO CO2 IN PREMATURE INFANTS WITH INTRAVENTRICULAR HEMORRHAGE, Maria Fort, Francoise Marotta, Mujahid Anwar, I. Mark Hiatt, Thomas Hegyi, UMDNJ-Rutgers Medical School, St. Peter's Medical School, Dept. of Pediatrics, New Brunswick, N. J.

No significant differences were found in the ventilatory response to CO2 in a group of very low birthweight infants evaluated for apnea. Twenty-two infants were divided into two groups based on the presence or absence of IVH. Group I consisted of 11 infants (BW 1050±380g, GA 28±1 wk), 8 suffering from Grade III, and 3 from Grade IV IVH. Eleven infants (BW 1130 ±210g,GA 28±2 wk) comprised Group II, the control population. Group I was examined at 44±9 weeks postconceptual age, and Group II at 42±10 weeks (P 0.05). Ventilatory response to CO2 was measured by a computerized waveform analyzer.

The results of the study are presented below:

	Group I (IVH)	Group II
Slope (ml/kg/min/mmHg BTPS)	35.8±16.4	33.6±16.2
Baseline PCO2 (mmHg)	39.6± 3.3	40.8± 5.3
Baseline Ve (ml)	307±144	287±123
PCO2 at Ve=300ml (mmHg)	39.7	36.10
N. aroused before test end	7	6

In the group of infants with apnea, IVH did not affect the slope or position of the CO2 response curve, the baseline data, nor the frequence of arousal prior to test completion. These responses did not correlate with IVH severity. The increased incidence of apnea with IVH does not seem to be related to a compromised response to CO2.

1393 VENTILATORY RESPONSE TESTING IN PREMATURE INFANTS, Maria Fort, Francoise Marotta, I.Mark Hiatt,Thomas Hegyi, UMDNJ-Rutgers Medical School,St. Peter's Medical Center, Department of Pediatrics, New Brunswick, NJ.

We studied the reproducibility of ventilatory response to CO2 in a group of premature infants with real or potential disturbances in the control of ventilation. (Ten infants BW 2.0±0.8 kg, GA 35±4 wks) comprised the test population, 6 with idiopathic apnea, 3 siblings of SIDS, and 1 near miss. The group was examined at 42±6 wks postconceptual age with a computerized waveform analyzer providing ventilatory response data to inhaled CO2. A second test was done 30 minutes after completion of the first.

	Test #1	Test #2	P
Slope (ml/kg/min/mmHg BTPS)	19.3±7.3	26.3±11.1	<0.01
Baseline Ve (ml)	233±137	220±99	<0.01
Baseline PCO2 (mmHg)	40.0±5.0	40.2±5.2	NS
PCO2 at Ve=300ml (mmHg)	41.7±9.4	42.8±5.9	NS

Significant correlation was found between the slopes, but significant differences were observed between their means($P<0.01$) Baseline Ve was significantly lower in the repeat test with six infants starting at a lower level. Seven infants aroused at a lower PCO2 in the second test but the PCO2's at arousal were not different.

It appears that the infants in this study became more sensitive to CO2 in the second test, as suggested by a steeper slope, lower baseline ventilation, and earlier arousal. We postulate that the CO2 challenge of the first test affected the second,and an interval greater than 30 min. may be necessary to duplicate results.

†1394 DEVELOPMENT OF MECHANICAL STABILITY OF THE RESPIRATORY SYSTEM IN PRETERM INFANTS. Gregory P. Heldt. (Spon. by Richard D. Bland) University of California and Cardiovascular Research Institute, San Francisco, CA. 94143

Distortion of the chest wall(CW) causes the diaphragm (DI) to make increased excursions for adequate pulmonary ventilation (PV). We studied the development of mechanical stability of the respiratory system by estimating the ventilation of the diaphragm (VD), its work (WD), and lung compliance (CL) in 6 preterm infants (wt. 780-1710g) at weekly intervals, from 29-36 post conceptional weeks (PCW) of age. Three to 5 studies were performed in each infant while in quiet sleep in room air. PV was partitioned between that produced by the CW and DI using a Respitrace inductance plethysmograph, calibrated against PV measured with a face mask and pneumotachograph, checked with airway occlusion. Esophageal and gastric pressures were measured with a modified feeding catheter.

CL increased linearly with age (CL = 0.61 PCW -17.3 ml/cm H_2O/kg, P .005), and VD decreased with age (VD = -14.8 PCW +603 % of PV, P .005). WD and VD decreased consistently in 4/6 infants. The other 2 infants developed apnea, with increased VD (122% and 187%) and WD (239% and 302%) compared to studies prior to apnea. Both VD and WD decreased to previous values with resolution of apnea. There was no relationship between CL and apnea.

These results suggest that apnea may be related to instability of the chest wall and diaphragm, as measured by VD and WD, independent of lung stability reflected by CL.

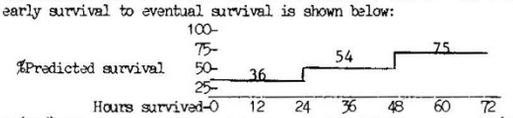
Supported by NHLBI SCOR HL-27356 and ALA 57002

1395 ADVISABILITY OF INTENSIVE CARE FOR VERY LOW BIRTH WEIGHT (VLBW) INFANTS Michael Horgan, Michael Sonnekalb, Marc Perlman, Nick Testi, Herman Risemberg, (Sponsor Bernard Pollara), Albany Medical Center, Department of Pediatrics, Albany, New York.

Controversy exists over providing intensive care to VLBW infants. We examined the effects of current intensive care on survival and neurologic outcome on 121 infants of birth weight (BW) 500-1000 gm born in 1981-82, and identified factors associated with death or poor outcome. Survivors (S) and non-survivors (NS) are characterized below: (GA=Gestation)

	N	BW (g±SD)	GA (wk±SD)	Days Ventilated (±SD)
S	44(36%)	900±89*	28.0±2.2*	13.2±15.8*
NS	77(64%)	735±156	25.7±1.7	2.1±4.7 *p .05

1 of 40 infants of BW<700 gm survived; 70% of NS were GA<27 wk. 56% of S were delivered by C-section, compared to 28% of NS. Use of mechanical ventilation, incidence of NEC, PDA did not differ between S and NS. The relation of early survival to eventual survival is shown below:



32(73%) S had neurodevelopmental assessments at 7-15 months. 16(50%) were normal, 7(22%) mildly abnormal, 9(28%) severely abnormal. Poor outcome was associated with Grade 3-4 IVH, prolonged ventilaion, BPD. Conclusion: Infants of BW<700gm, GA<27 wk, especially if vaginally delivered, have remote chances of survival. Most deaths occur by 48 hours despite intensive care. Infants successfully supported past 48 hours have reasonable chances of a good quality survival. Supported in part by NYS OMR-DD Grant

1396 ASSOCIATION OF PERINATAL FACTORS WITH INTRACRANIAL HEMORRHAGE (ICH) IN THE VERY LOW BIRTHWEIGHT (VLBW) PRETERM NEONATE Alastair A. Hutchison, Jeffrey M. Barrett, Arthur C. Fleischer, Ronald G. Thomas, A. Everette James Jr, Mildred T. Stahlman. Vanderbilt University, Dept. of Ped., Nashville, and Univ. of Florida, Depts. of Ped. and Biostat., Gainesville.

Perinatal factors were recorded from one hundred inborn VLBW neonates, studied consecutively. Their mean (± SE) gestational age (GA) was 29 ± 0.4 weeks and their mean birthweight (BWt) was 1094 ± 45 g. Cranial ultrasound was used to diagnose the presence and severity of ICH. The incidence of ICH was 32%, 18% being major and 14% minor. The mortality from ICH was 34%, representing 56% of those with major and 7% of those with minor ICH. Univariate analysis showed that only premature labor (prem lab) and vaginal delivery (vag del) were significantly associated with the diagnosis of ICH. The reduced incidence of ICH associated with cesarean section was noted only if the presentation was vertex. Using stepwise logistic regression to build a model from potential risk factors, prem lab, admission $PaCO_2$ ($AdPaCO_2$), Apgar at 1 min and vag del were identified as the most predictive factors for ICH. The most predictive factors in those <30 wks GA were prem lab and artificial ventilation for greater than 24 hours (IMV>24 hrs), and in those ≥30 wks were vag del, Apgar at 5 min and $AdPaCO_2$. The occurrence of major ICH was predicted best by GA, IMV>24 hrs. and prem lab. ICH in the VLBW neonate relates to the presence of prem lab and respiratory distress in the very immature neonate, while mode of delivery and early respiratory care are important in the more mature high risk preterm neonate.

† 1397 TRANSIENT HYPERAMMONEMIA OF THE NEWBORN (THAN) AND UREA CYCLE ENZYME DEFECTS (UCED) DIFFERENTIATED BY CLINICAL PRESENTATION. M.L. Hudak, M.D. Jones, Jr., and S. Brusilow. Johns Hopkins Hospital, Baltimore, Md. 21205

THAN and UCED have been presumed to have identical clinical presentations (N. Engl. J. Med. 299:920, 1978). We reviewed clinical data on 19 patients with THAN: 5 previously unreported and 14 from the literature. Thirteen neonates with UCED within the past 5 years served for comparison. Both obstetrical and neonatal data were analyzed by χ-square and Student's t tests. No differences were found in the route of delivery, perinatal complications, Apgar score, sex, or in incidence or time of onset of seizures. On the other hand, neonates with THAN had significantly lower birth weights (2255±97 vs 3335±222 g, $p<.001$, X±SEM) and gestational ages (34.4±0.5 vs 39.6±0.6 wks, $p<.001$). Onset of respiratory distress (3.5±1.6 vs 70±26.4 h, $p<.01$), ventilatory support (26.1±5.2 vs 79.4±11.9 h,p <001), lethargy (25.5±4.7 vs 77.3±17.0 h, $p<.01$) and coma (41.7±5.9 vs 97.5±16.7 h, $p<.01$) occurred earlier in THAN. Significant distinguishing laboratory features in THAN included more frequently abnormal chest x-rays (10/12 vs 0/9, $p<.001$) and initial serum ammonia levels that were higher (3049±483 vs 1745±287µg/dl, $p<.05$) at an earlier age (55.5 ±7.2 vs 124.6±22.3 h, $p<.01$). Seventeen patients with THAN and all patients with UCED could be scored on at least 4 of these 7 criteria: birth weight ≤2500 g, gestational age ≤36 wks, respiratory distress <12 h, lethargy ≤36 h, coma ≤48 h, abnormal CXR, and initial (NH_3) >1500µg/dl. All 16 patients with total score ≥4 had THAN ($p<.001$). The clinical presentation alone differentiates THAN from UCED.