

**1321** THE EVOLUTION OF PRIMITIVE REFLEXES PRIOR TO TERM IN EXTREMELY PREMATURE INFANTS, Marilee C. Allen, M.D. and Arnold J. Capute, M.D., Johns Hopkins School of Medicine, Department of Pediatrics, and The John F. Kennedy Institute, Baltimore, Maryland.

The emergence of 7 primitive reflexes in a population of 47 premature infants with BW below 1300 gms born at Johns Hopkins Hospital in 1983 is described. These extremely premature infants (67% were at or below 28 wks gestation) were examined weekly, from 1 week until discharge, and the primitive reflexes were quantitatively graded as to completeness and intensity of response.

The upper extremity (UE) and lower extremity (LE) grasps were present in all premature infants, from 25 wks postconceptional age (PCA) and beyond. The Moro, asymmetric tonic neck reflex (ATNR) and Galant were present in some as early as 25 wks PCA, and in the majority by 30 wks PCA. The positive support and stepping appeared at 30 wks PCA in some, yet were not universally present even by term (40 wks PCA). Each of the primitive reflexes became stronger, more complete and more prevalent with increasing postconceptional age. The pattern of primitive reflexes in the premature infant at term is similar to that of full term newborns.

Sequential assessment of the primitive reflexes may be a useful method of evaluating extremely premature infants prior to term.

1. Capute, A.J., F.B. Palmer, B.K. Shapiro et al: Primitive reflex profile: A quantitation of primitive reflexes in infancy, Dev Med Child Neur 1984, 26:375

**1322** CHANGES IN SERUM TOTAL AND UNBOUND BILIRUBIN, ALBUMIN AND HABA BINDING DURING DOUBLE VOLUME EXCHANGE TRANSFUSION. Ananda K. Ananda, Yu-Sheng Wu and Paul Y.K. Wu. Neonatology Division, Dept. of Pediatrics, Univ. of So. Cal. Sch. of Med., LAC-USC Med. Ctr. Los Angeles, CA.

Double volume exchange transfusions (ET) in neonates are generally used to reduce serum bilirubin concentrations and also provide fresh albumin to enhance bilirubin-albumin binding. This would be expected to reduce the circulating unbound bilirubin (UB). We measured serum total bilirubin (TB), UB, albumin (Alb) and HABA binding sequentially at quarterly intervals (of total blood volume exchanged) and at 4, 24, and 48 hours post exchange in 9 double volume ET, assuming the infant's blood volume to be 80 ml/kg b.wt. TB and UB were measured by the new automated peroxidase micromethod with the UB analyzer UA-1 (Lobo Science USA-inc.). Results: TB and UB decreased, while albumin and HABA-binding increased with increasing volume of blood exchanged. Maximal changes occurred during the first quarter of the exchange transfusion. Sequential mean percent changes were:

ET STATUS	25%	50%	75%	100%	
Δ TB%	19.4	8.6	9.9	6.1	The mean aggregate reduction for TB and UB was 40 and 70% respectively.
Δ UB%	33.1	17.1	27.9	2.7	
Δ Alb%	17.5	2.6	13.6	1.4	Mean aggregate increment for albumin and HABA-binding was 29 and 128% respectively. The UB Analyzer UA-1 can provide rapid information on the efficiency of exchange transfusion and status of protein-anion complex.
Δ HABA%	17.5	2.5	16.5	0.6	

**1323** NEURODEVELOPMENTAL OUTCOME AT 2 YEARS IN PRETERM INFANTS WITH INTRAVENTRICULAR HEMORRHAGE. Craig L. Anderson, Carey L. Halsey, Gasudraz S. Ahmed and Thomas F. Myers. (Spon. A. Cuttiletta). Loyola University Stritch School of Medicine, Dept. of Pediatrics, Maywood, Illinois. Forty-six infants with b. w. < 1,501 gm were prospectively studied to determine if the presence and grade of IVH adversely affected neurodevelopmental outcome. CT scans were done on all infants and hemorrhages graded according to Papile's method. Twenty-six infants had no hemorrhage (Group 1); 12 had Grade I or II (Group 2), and 8 had Grade III or IV (Group 3). Groups did not differ in x b. w., obstetrical complications, or socioeconomic status. The following were significantly different between groups:

	Group 1	Group 2	Group 3
x GA	30.7	29.5	28
x Postnatal Complication Score	77.1	64.6	62.2
x Bayley PDI	91±13	81±13	66±21
x Bayley MDI	116±24	99±17	79±38
Abnormal Neuro Exam	0%	10%	67%

In spite of significant mean differences in Bayley scores and abnormal neurological examinations among the groups, 3 of 7 (43%) patients in Group 3 were completely normal. We suggest that although Papile's method of grading IVH is useful it is not reliably predictive of abnormal outcome.

**1324** RELATIONSHIP OF ENDEMIC NECROTIZING ENTEROCOLITIS (NEC) TO ALIMENTATION. DM Anderson, ES Rome, RM Kliegman. CWRU, Depts Nutr & Peds, Clevel, OH

Feeding has been implicated in the etiology of NEC. To determine the relationship between milk selection, enteric(PO) feeding rate and total fluid volume, the alimentation records of 19 cases of NEC were compared to 2 controls(CON) for each NEC, matched by birthweight and time of admission(CON=38). Birth-weight(1.4±0.4 v 1.4±0.4kg) (X±SD), gestational age(31.6±2.8 v 31.4±2.6wks), Apgars, sex, weight for age, incidence of intubation and umbilical arterial catheters(UAC) were similar. Initiation of feeds after removal of UAC was equivalent: NEC 30.8±19.2 and CON 51.3±46hr. Furthermore, the use of PO medications, formula/milk selection, aspirates as % of feed, 1st day of PO feeds (3.9±2.6 v 7.3±8.7d) and volume fed 1st day(22±20 v 16±13) were not different. Onset of NEC was 9.9±6.3d of life. The day of maximum PO volume among NEC patients was 5.0±4.1 and was matched to that specific, corresponding day in the 2 respective case controls(table). The daily increment of PO volume was greatest

	POml/kg	Daily rate of increase	Tot Vol	IV Vol
NEC	124±57	27.9±16	161±44	35±48
CON	84±60	16.8±11	137±39	49±50
p value	<0.02	<0.001	NS	

in NEC patients after 3±2d of feeds. This increment was higher in NEC(57±19 v 22±30, p<0.001) when matched for the increment on the corresponding day in CON. We conclude that rapid feeding progression or excessive acute volume increments may predispose the neonate to endemic NEC.

**1325** NONINVASIVE MONITORING OF OXYHEMOGLOBIN SATURATION IN CRITICALLY ILL INFANTS. John V. Anderson, Jr., Katherine S. Claflin and Fred K. Hall (Spon. by Robert T. Hall), Univ. of Missouri School of Medicine, Children's Mercy Hospital, Dept. of Pediatrics, Kansas City, Missouri.

A noninvasive method for continuously determining oxyhemoglobin saturation (O2 sat) was compared with measured arterial O2 sat. Fifty-two critically ill infants (71% Caucasian) were sequentially selected because of their need for arterial oxygen measurement. Concurrent readings were taken from a Nellcor Pulse Oximeter (P.O.) at the time of arterial sampling. Thirty-seven infants had samples from umbilical arterial catheters and fifteen from percutaneous arterial punctures. Arterial O2 sat was measured on a Radiometer OSM-2 Hemoximeter or an Instrumentation Laboratory Model 282 CO-Oximeter. The infants were characterized as follows:

percentile	age(days)	wt(gm)	Arterial O2 Sat	P.O. O2 Sat
10th	0.42	760	78	72
50th	2.0	1490	95	91
90th	45.0	2890	100	96

Analysis performed by the method of least squares showed the regression line to be

$$\text{Arterial O2 sat} = 22 + (0.72 \times \text{P.O. O2 sat})$$

The Pearson Product-Moment Coefficient (r) was 0.89 with an r-square of 0.79. The standard error of the estimate was 4.6. In conclusion, the Nellcor Pulse Oximeter can reliably determine arterial O2 sat in the critically ill newborn.

**1326** ROUTINE SUCTIONING AND DOPPLER BLOOD FLOW ECHOES IN LOW BIRTHWEIGHT (LBW) NEONATES. Ede M. Apostolakis,\* Ramon Gonzalez,\* Ron Palmer, Stephen Ashwal, (Sponsored by Joe Quilligan), Loma Linda University School of Medicine Departments of Pediatrics and Physiology, Loma Linda, CA.

We applied spectral analysis of Doppler echoes to describe cerebral artery characteristics in 14 stable 24-hr-old neonates (M. Wt=1016gm;M.gest.age=27 wks) before(DB), 1 min. after 20% increase in FIO2, and ventilation(AS), with each catheter passage (S 1-5), and at 1(PS1), 3(PS3), 5(PS5) and 10(PS10) min.after last passage. Mean peak-systolic(SBw) and end-diastolic(DBw) bandwidths peak-systolic frequencies(PF), heart rate(HR), mean BP(mBP) and pulse pressure(PP) include:

	DB	AS	S2	S3	PS3	PS10
SBw(KHz)	1.06±.14	.70±.07	.90±.18	.84±.19	.58±.05	.67±.06
DBw(KHz)	.59±.06	.64±.11	.62±.12	.48±.08	.37±.07	.40±.06
PF(KHz)	1.81±.14	1.60±.11	1.93±.31	1.53±.23	1.33±.17	1.42±.23
HR(b/min)	152±3	158±3	151±4	152±4	158±6	150±3
mBP(mmHg)	37±1	39±2	41±3	40±2	37±2	38±1
PP(mmHg)	18±1	18±1	18±2	19±1	18±1	22±2

Correlation coefficients indicate little relation between sonic characteristics of baseline AC flow and HR/mBP. Strong correlation was during AS with mBP, during sequential suctioning with HR/mBP, and during PS with HR. These data suggest when LBW neonates are at rest, AC vascular bed flow is primarily resistive, but becomes reactive during AS, with suctioning, and for considerable time after suctioning. This implies significant change in physical characteristics of AC vascular bed in association with suctioning of stable 24-hr-old LBW neonates.