

### 1344 BENIGN TRANSIENT HYPERBILIRUBINEMIA OF THE NEWBORN.

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Currently we placed all healthy term infants under phototherapy when their serum bilirubin  $\geq 15$  mg/dl. In an effort to re-evaluate our management of jaundice in our normal nursery population we screened 6,500 infants. Eight percent of these infants had peak bilirubin levels  $> 12$  mg/dl and were held in the hospital after maternal discharge for further evaluation. Two-thirds of this group had clinical and laboratory evidence of hemolytic disease. One-third of the held infants ( $n=100$ ) had no clinical, historical, or laboratory explanation for their hyperbilirubinemia. We are calling this condition benign transient hyperbilirubinemia of the newborn. The majority of these infants peaked at 14 mg/dl and required no treatment. Only three of the 100 infants had bilirubins  $> 18$  mg/dl and were treated with phototherapy. In conclusion we believe that we have identified a benign process in our infants for which treatment has been very arbitrary. All standard laboratory tests to evaluate jaundice except the Coombs test were not helpful in identifying this group of infants. Finally, the arbitrary treatment of healthy, term infants with benign transient hyperbilirubinemia needs to be re-evaluated.

### 1345 MORTALITY AFTER DISCHARGE FROM NEONATAL INTENSIVE CARE.

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Mortality rates for neonatal intensive care units are often reported as neonatal deaths ( $<28$  days) or deaths prior to discharge from the unit. We investigated deaths occurring after discharge from our intensive care nursery (ICN). Of 1,978 admissions to the Dartmouth-Hitchcock Medical Center ICN for the years 1976-1981, 225 infants died prior to discharge (11.4%). We matched the remaining 1,753 infants with New Hampshire and Vermont death records. We identified 40 post discharge deaths; 33 occurred at age  $<1$  year. Causes of death are recorded below.

Birth Defects	22
Congenital Heart Disease	5
Chromosomal	8
Other Birth Defects	9
Sudden Infant Death Syndrome (SIDS)	8
Birth Asphyxia (sequelae)	3
Infections	3
Other	4

Seven of the 8 SIDS infants were premature (out of 1,234 pretermures discharged); 6 of the 8 were male; 3 were one of twins. Apnea was identified prior to discharge in only 4 of the SIDS group. Significant pathology in the SIDS group related to the neonatal course included periventricular leukomalacia with cerebellar atrophy, laryngeal fibrosis with stenosis and bronchopulmonary dysplasia.

### †1346 CLASSROOM PERFORMANCE, HEALTH, SOCIAL FACTORS OF VERY LOW BIRTH WEIGHT (VLBW) CHILDREN: FOLLOW-UP AT 5-8 YEARS.

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Increasing survival of VLBW infants causes concern for long term health and educational needs. This study was designed to locate VLBW children at school age, to compare educational services they required with peers and term siblings and to review computerized data of the hospital course. Parental, educational and medical information was obtained from questionnaires, interviews and clinic or field visits. Of 43 neonates weighing  $<1250$ g ( $\bar{x} \pm \text{SEM} = 1076 \pm 19.2$ ) admitted for intensive care from 1974-1978 and surviving to school age, 7 were lost to follow-up and 3 have yet to attend school. Of the 33 VLBW children in school, 3 (9.1%) were in classes for the major handicapped while 30 (90.9%) were found comparable to their classmates by teachers or test scores; however, 14/30 (47%) required remedial instruction to perform at grade level. Major medical problems included seizures, spastic diplegia and visual or hearing loss. Of 13 VLBW children with siblings in school, 3 required more specialized staff than their siblings. The group without the need for specialized teaching staff had older maternal ages ( $\bar{x} \pm \text{SEM} = 24.7 \text{ yrs} \pm 1.28$  vs  $21.7 \pm 0.74$ ,  $p < 0.05$ ,  $t$ -test) and tended to reside in higher socioeconomic households by Hollingshead Index ( $p < 0.10$ ,  $\chi^2$ ) which may have resulted in more stimulation at home. The VLBW children had a greater proportion (17/33, 51.5%) requiring specialized instruction than the general school population (24%,  $p < 0.001$ ,  $\chi^2$ ), although with this instruction most compared favorably with classmates.

### 1347 THE EFFECT OF SUCTIONING ON PASSIVE RESPIRATORY SYSTEM MECHANICS IN INTUBATED PREMATURE INFANTS.

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Based on the hypothesis that mucous accumulation increases airway resistance, we measured passive respiratory system compliance (Cr<sub>s</sub>), resistance (R<sub>s</sub>) and the product of these mechanical variables, time constant (Tr<sub>s</sub>), just prior to and immediately following suctioning in 11 studies on 8 premature infants. All infants were intubated (3 mmID endotracheal tube (ETT)) and artificially ventilated with peak pressures ranging from 12-27 cmH<sub>2</sub>O and with 3-4 cmH<sub>2</sub>O end expiratory pressure. Ventilator rates ranged from 5-40 per minute. Inspired oxygen concentration varied from 0.21 to 0.35. A valve was inserted between the ventilator circuit and the ETT connector of the infant who continued to receive the required ventilation. Cr<sub>s</sub>, R<sub>s</sub>, and Tr<sub>s</sub> were obtained by occluding the airway at end-inspiration, measuring occlusion pressure and the flow and volume of the subsequent passive expiration. R<sub>s</sub> and Tr<sub>s</sub> fell significantly ( $p < 0.02$ ) after suctioning by an average of 19 and 25% respectively while Cr<sub>s</sub> did not change in a systematic manner. The high resistance in intubated infants is not entirely a function of the diameter of the ETT. It also depends on the amount of mucous accumulating within and at the tip of the tube. While a high inspiratory resistance is inconsequential to the ventilated infant, a high expiratory resistance is not. If the resistance is sufficiently high to increase Tr<sub>s</sub> to a value close to expiratory time, an occult PEEP may be generated and hyperinflation will occur.

### 1348 VITAMIN E CONCENTRATION IN NEWBORN'S SERUM AFTER TOPICAL USE OF VITAMIN E BY NURSING MOTHERS.

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Topical vitamin E oil has become a popular, though unproven, treatment for sore nipples occurring in the early days of breast feeding. We examined the effect of maternal topical vitamin E oil on serum vitamin E levels in twenty healthy, term, breast-fed infants on the first and sixth day of life. Ten mothers (group A) applied the contents of a capsule of 400 I.U. of d,l alpha tocopheryl acetate to nipples and areolae after each nursing. The other ten mothers (group B) used either lanolin or no topical treatment. No effort was made to remove Vitamin E before feeding and babies nursed at least six times per day.

Vitamin E levels in umbilical cord serum were similar in the two groups,  $0.40 \pm 0.14$  (A) and  $0.34 \pm 0.12$  mg/dl (B). In contrast, on day 6, the group A infants had significantly higher serum vitamin E levels ( $1.75 \pm 0.57$  (A) vs.  $1.22 \pm 0.37$  mg/dl (B)  $p < 0.025$ ). No clinical effects attributable to vitamin E were noted during this period.

We conclude that topical application of vitamin E oil by breast-feeding mothers results in higher levels of vitamin E in the nursing infant's serum. In view of reported adverse effects associated with elevated serum vitamin E levels in premature infants and term newborn animals and in view of the unproven efficacy of topical vitamin E for nipple soreness, we would discourage routine use of topical vitamin E by nursing mothers.

### 1349 PALATAL GROOVE (PG) FORMATION IN THE OROTRACHEAL INTUBATED INFANT (I).

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Use of orotracheal intubation (OI) in I has been associated with PG formation, acquired cleft palate and defective dentition. The purpose of this study was to determine the incidence of PG formation in I requiring OI for 1 to 62 days. Over a 12 month period, maxillary casts were made of 163 infants requiring an orotracheal or orogastric tube. An impression of the maxillary arch was made using a thermal plastic compound and a specially developed acrylic tray. A master cast was produced from the impression using dental stone. A PG was defined as a narrow channel of variable depth located near the midline of the palate as defined by visual inspection of the maxillary cast.

Sixty-three I weighing between 0.58 and 4.4 kg. had an orotracheal tube in place for 1 to 62 days prior to making of the maxillary cast. Forty-two of the I weighed less than 1.5 kg., and 68% had the maxillary impression taken during the first week of life. A PG was present in 47.6% of the I. An I intubated for less than 7 days had an incidence of PG formation of 39.5%, while an I intubated for 15 days or longer had an incidence of 87.5%. Maxillary impressions were made of 100 I weighing between 0.72 and 4.5 kg. with an orogastric tube in place for 1 to 50 days. No PG were seen in these 100 I. Conclusion: 1) OI is associated with a high incidence of PG formation. 2) The longer the duration of OI, the greater the incidence of PG formation.