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THE IMPROVING SURVIVAL OF < 1000 BIRTH WEIGHT INFANTS - 1963-76. W.D. Cochran and H.W. Tausch,

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 Of approximately 6,000 deliveries/yr., 4.8/1000 were < 1000 gms. in the years 1963-76. In 1976 the survival rate of this weight group, for the first time, rose above 20%. Since 1971 when it began being documented, gestational age of all the infants was 25.8 wks. but for those who lived it was 27.1 wks. Analyzing in 50 g. weight group increments, we found that the survival rate for the 950-1000 weight group did not exceed 50% until 1974. In 1974 there was a 55% survival rate, in 1975 a 78% survival rate and in 1976 a 67% rate for this group (950-1000 g).
 In the years 1975-76, analyzing the use of respirators for this weight group (< 1000 g.) as to the day of onset of respirator use and ultimate survival, we found that no infant survived whose birth weight was < 750 g. if put on a respirator at anytime. Between 750-800 gms. none survived if < 2 days old when first treated with a respirator. For the group > 900 g., some infants survived when treated with respirators less than one day of age. We conclude that very low birth weight infants have increased survival when treated in perinatal centers wedding neonatal intensive care with obstetric intensive care.

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RESTING OXYGEN CONSUMPTION OF PREMATURE INFANTS COVERED WITH A THERMAL BLANKET DESIGNED TO REDUCE INSENSIBLE WATER LOSS. Robert A. Darnall, and Ronald

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 Premature infants in single wall incubators covered with "thermal blankets" (TB) made of plastic packing material have large reductions in insensible water loss (IWL) compared to naked infants. We postulated that such reductions in evaporative heat loss would not result in decreases in caloric expenditure if body temperature were maintained by a servo controlled heat source. Using an open circuit technique, we measured oxygen consumption ($\dot{V}O_2$), carbon dioxide production ($\dot{V}CO_2$), heart rate (HR), respiratory rate (RR), abdominal skin (T_{abd}), cheek, thigh, rectal, incubator air, wall, and room air temperature in 10 infants less than 36 weeks gestation and from 2 to 24 days of age both naked and covered with a plastic TB. T_{abd} was maintained between 36.2 and 36.8 and rectal temperature between 36.8 and 37.2 °C. in each environment by manual or automatic servo control. A "resting state" was defined using a combination of subjective and objective criteria. The mean values of $\dot{V}O_2$ during the "resting state" were 7.31 and 7.59 cc/kg/min. for naked and covered infants, respectively. Mean values of $\dot{V}CO_2$, respiratory quotient, HR, RR, abdominal, cheek, thigh, and rectal temperatures were essentially identical in both environments. Operant temperatures, however, averaged 0.5 °C. lower when the infants were covered. These data support the hypothesis that decreases in IWL do not necessarily imply reductions in caloric requirements in infants where T_{abd} is maintained by servo control.

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EVALUATION OF EARLY POSTPARTUM DISCHARGE PROGRAM IN A LARGE METROPOLITAN HOSPITAL. Carl F. Coffelt, Paul

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 An increase in deliveries from 9,000 to over 12,000 per annum necessitated the adoption of an early discharge program at the LAC-USC Med. Ctr. in November 1974. 'Normal' mothers/infants were identified by strict protocol and discharged at <48 hrs. instead of >72 hrs. This report represents the result of an evaluation study of the program covering the period June 21 to August 31, 1976. Basic demographic prenatal and delivery information was obtained from the hospital discharge and home visit referral forms. Information on patient's safety and satisfaction was obtained from two questionnaires, one completed by patient and visiting nurse between 3rd and 5th postpartum day, and the other by the patient 10 to 14 days postpartum. There were 1,276 early discharge patients representing 47% of deliveries: 810 cases had home visits by a visiting nurse. In the mothers 15% had problems, 2% required emergency room referrals, and 0.25% hospital readmission. In the infants, 16% had problems, 6% required emergency room referrals and 0.9% had hospital readmission. A comparison of 147 patients discharged between 25-36 hrs. with those discharged between 49-60 hrs. postpartum did not reveal any significant difference in problems found at home visit. Eighty-five percent of the patients expressed satisfaction with the program.

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TRANSPORTING SICK NEONATES < 1000 GRAMS IN NEW YORK CITY. CORRELATES OF SURVIVAL. Yvonne D'Sylva, Angelo

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 During a 2 year period (1975-1976) 159 preterm neonates <1000 grams were transported by NYC-ITS from 60 hospitals to 12 regional centers. All were M.D. assisted & 47.6% were intubated. The preterms were stratified into 2 weight groups: 39 "Light" <750 gm with \bar{x} (mean wgt) 657.7 gm \pm 102.8gm (SD) & 120 "Heavy" 751-1000 gm with \bar{x} of 887.6 gm \pm 73.2 into 2 time periods of age (<3h, >3h) & into 4 types of hospitals of birth (Voluntary and Municipal with residencies & Voluntary & Proprietary without residencies). Overall survival was 33.8% (smallest survivor was 567gm).
 RESULTS: (1) By F testing no significant difference in survival by 4 types of hospital of delivery. (2) No significant difference in survival by age of preterm at time of transport. (3) Within each weight group ("L&H") no significant difference in survival by hospital, age or time. (4) Significant difference in survival of those intubated at hospital with residencies (16.7%) versus those \bar{x} residencies (0%). Overall intubated survival rate=12.5%. (5) Significant survival difference between "Light" (10.3%) and "Heavy" group (41.7%); $\chi^2=13.5$ -P<.0005.
 SURVIVAL RATES BY WEIGHT, AGE & HOSPITAL OF ORIGIN

	Prop. \bar{x}	Vol. \bar{x}	Vol. \bar{c}	M \bar{c}
N=39 "Light"<3h	N= 5(0%)	N= 2(0%)	N=10(10%)	N= 5(0%)
"Light">3h	N= 1(0%)	N= 0(0%)	N= 5(0%)	N=11(18.2%)
N=120 "Heavy"<3h	N=11(36.4%)	N=11(36.4%)	N=24(37.5%)	N=17(47.1%)
"Heavy">3h	N= 7(42.9%)	N=4(50%)	N=26(50%)	N=20(35%)
N=159 MEAN TOTAL:	29.2%	35.2%	36.9%	32.1%

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A NOVEL FLUORESCENCE TECHNIQUE FOR DETERMINING BILIRUBIN BINDING CONSTANTS (LIPIDS AND ALBUMIN) AND SERUM BILIRUBIN (FREE AND TOTAL). Marilyn L. Cowger

and Sunji Nagaoka, Albany Medical College, Department of Pediatrics and State University of New York, Department of Chemistry, Albany, New York.
 The interaction of bilirubin with various lipids was studied utilizing a novel approach - a static fluorescence quenching method. A quenching equation was developed to determine bilirubin binding constants. The method was tested first by a dansyl bovine albumin system which yielded an association constant of $3.5 \pm 1.6 \times 10^7 M^{-1}$ and then applied to fluorescence probe containing lipids. Of the pure lipids tested, sphingomyelin showed the highest association constant ($2.4 \times 10^8 M^{-1}$). Two mixed lipid systems showed the following values; bovine brain lipid 4.2 to $5 \times 10^5 M^{-1}$ and pig skin lipid 3 to $3.6 \times 10^5 M^{-1}$.
 The techniques used in this work led to the development of a unique method for measuring serum bilirubin. The method is sensitive, compares well to the diazo method, and uses minute quantities of blood (5ul sample). It is also applicable to the determination of "free" bilirubin in serum. The experimental values were in agreement with those expected theoretically at and above the point where albumin is saturated with bilirubin, but were considerably higher at unsaturated conditions. (Supported by NIH).

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CEREBROSPINAL FLUID BICARBONATE AND POTASSIUM REGULATION IN ICN NEONATES William H. Edwards, E.E. Nattie*,

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 CSF obtained for evaluation of potential sepsis in 42 ICN babies of B.W. 930-4090 gms. and gest. age 27-42 wks. was evaluated for HCO_3^- and K^+ regulation. Total CO_2 content was measured. CSF HCO_3^- was compared with plasma values calculated from pH and PCO_2 measurements bracketing the time of L.P. in infants with stable acid-base values for 3 hours. CSF K^+ was compared with same day plasma values. Three HCO_3^- groups appeared evident within the wide distribution of values. I: A reference group with minimal abnormality where CSF HCO_3^- was greater than expected from adult results. II: A group of infants with sepsis, birth asphyxia or recent severe hypoxia. CSF HCO_3^- values were lower than expected when samples were obtained within 24 hours of the insult. III: A small group (N=3) with severe metabolic acidosis and no sepsis or recent hypoxia that had CSF HCO_3^- values similar to those of Group I.

	pH	PCO_2 (mmHg)	HCO_3^- (mM/l)	CSF
Group I (N=6)	7.33 \pm 0.02	40.1 \pm 2.5	19.7 \pm 0.7	22.9 \pm 0.6
Group II (N=12)	7.29 \pm 0.03	40.6 \pm 3.2	17.4 \pm 0.5	17.1 \pm 0.9

With respect to K^+ in 38 of 42 infants CSF values varied from 3.0-3.9 mM/l while plasma values ranged from 3.1-6.3 mM/l. Our results suggest these infants regulate CSF HCO_3^- poorly when stressed by sepsis, severe hypoxia or birth asphyxia. They regulate CSF K^+ very well. (Partially supported by NHLBI grant HL 18351; * supported by NIH RCDA HL 00364.)