1441 PERINATAL REGIONAL CEREBRAL BLOOD FLOW (rCBF): EFFECT OF THEOPHYLLINE. David T. Lyons, Robert C. Vannucci. (Spon. by Edward O. Reiter),Univ. of Mass., Baystate Medical Center, Dept. of Ped., Springfield, MA and Cornell Univ. Medical College, Dept. of Ped. and Neurol, NY,NY.

Theophylline (T) is known to produce cerebral vasoconstriction in both animals and humans. It is unclear whether these effects vary regionally, especially in the developing brain. Using the tracer iodo-[^{14}C] antipyrine and the indicator-fractionation technique described by Cavazutti and Duffy, we studied rCBF in awake newborn dogs (3 to 9 days old), treated with either saline (n=4) or T (n=3).

Catheters were placed in the right common carotid artery and the right external jugular vein while under halothane anesthesia. Following a 4 hour recovery period, either T, 45 mg/kg, or saline was administered by slow IV infusion. After an additional 1 hour equilibration period, the rCBF measurement was performed. pCO_2, measured just prior to rCBF determination, was 36 ± 3 mm Hg (mean ± S.D.) in the saline group and 26 ± 6 mm Hg in the T group. T levels in treated animals equaled 38 ± 4 µg/ml.

RCBF in the saline group ranged from 6 ml/100 gm/min in subcortical white matter to 75 ml/100g/min in the oculomotor n. nucl. T treated dogs, when compared to saline treated dogs, had lower values in all 28 areas of the brain analyzed. Thalamic and midbrain nuclei showed the greatest reductions (35-48%). At the other extreme, medullary and cerebellar structures showed little reduction (7-16%) with T. Though exceptions were noted, the degree of T associated reduction in rCBF generally paralleled reported newborn dog CO_2 - CBF sensitivity.

†1442 REGIONAL CEREBRAL BLOOD FLOW (rCBF) IN THE IMMATURE RAT. David T. Lyons, Robert C. Vannucci. (Spon. by Edward O. Reiter), Univ. of Mass., Baystate Medical Center, Dept. of Ped., Springfield, MA, and Cornell Univ. Medical College, Dept. of Ped. and Neurol., NY, NY.

7-day old rats (15 g body weight) were injected subcutaneously with iodo-[^{14}C] antipyrine (5 µCi). After a variable period, each pup was decapitated and arterial blood collected for scintillation counting. Brains were immediately removed and either prepared for isotopic counting or frozen for autoradiography. The brain: blood partition coefficient was determined (0.944 ± .066 ml/g (mean ± S.E.)). Both cerebral hemispheric blood flow (CHBF) and rCBF were calculated according to a formula derived from the Fick equation. CHBF equaled 66 ± 4 ml/100 g/min (mean ± S.E.), a value midway between reported 1-day old rat CBF and adult rat CBF. Autoradiograms were of sufficient quality to permit microdensitometric readings of a minimum of 11 structures. rCBF ranged from 20 ml/100 g/min in subcortial white matter to 71 ml/100 g/min in the brain stem. Immature rat rCBF, as a proportion of adult rat rCBF, was greatest in brain stem.

Other 7 day old rats underwent right common carotid artery ligation and subsequent exposure to an 8% O_2 environment. Right hemispheric flow was reduced to less than 5% of left hemispheric flow. This reduction was greatest in the distribution of the right middle cerebral artery. Vascular columns perpendicular to the pial surface, corresponding to columns seen metabolically and histopathologically, were not found. Thus, we have developed a relatively simple means of measuring rCBF in the immature rat and we have used it to study a model of cerebral hypoxia-ischemia.

●1443 IS ULTRA EARLY (UE) SURFACTANT (S-TA) TREATMENT IN HYALINE MEMBRANE DISEASE (HMD) BENEFICIAL? Haruo Maeta, Dharmapuri Vidyasagar, Tonse Raju, Hiroo Matsuda, Rama Bhat, Margaret Go, Urmila Dahiya, Yvette Roberson. University of Illinois Hospital, Department of Pediatrics, Chicago, Illinois.

Although S-TA has been used in the treatment of HMD, the optimal time of therapy is not established. We compared the physiologic responses to ultra early (UE) and late (LT) treatment of S-TA therapy in preterm baboons (76% of term). After C-section they were intubated and ventilated. S-TA 100 mg/kg was instilled at 10' in UE group and at 2 hrs. in LT group. All were treated to maintain normoxia, normocarbia, and normal pH range. Sequential data are shown below. Improvement in compliance (CL) was significantly

Time	(post surf.)	Pre-1 hr.	Post-1 hr.	Post-6 hr.	Post-14 hr.
CL	UE group		0.36±0.10	0.37±0.07*	0.35±0.07**
	LT group	0.21±0.08	0.37±0.03	0.23±0.06	0.26±0.05
a/APO_2	UE group		0.52±0.08	0.48±0.11	0.55±0.01
	LT group	0.20±0.10	0.53±0.05	0.42±0.08	0.52±0.17
FiO_2	UE group		0.86±0.05	0.45±0.13	0.32±0.07
	LT group	1.00±0	0.87±0.05	0.50±0.12	0.34±0.07
MAP	UE group		8.7±1.2***	8.4±1.6***	5.2±2.2***
	LT group	14.5±1.1	13.4±1.6	11.7±0.7	10.2±0.5

(Table: X ± S.D., *p<0.05, **p<0.01, ***p<0.005)

better in UE than LT group. Mean airway pressure (MAP) dropped significantly in UE group reaching 5.2±2.2 cmH_2O at 14 hrs. P-V curves of lungs at autopsy showed significantly higher lung vol. (at P5 deflation, 19.3±5.2 vs 11.6±2.8 ml/kg. P<.02) in UE group. These data suggest UE treatment establishes rapid alveolar stability and improves lung compliance facilitating rapid drop in MAP. better than the late treated group.

†1444 OPTIMAL THERMAL MANAGEMENT FOR LOW BIRTHWEIGHT INFANTS NURSED UNDER HIGH-POWER RADIANT WARMERS. Seth Malin & Stephen Baumgart (Spon. by W.W. Fox). Univ. of Pa. Sch. of Med., Dept. of Peds., Children's Hosp. of Phila., Phila., PA.

Radiant warmers positioned over open bed platforms provide continuous thermal maintenance while allowing ready access to critically ill infants. There are no studies defining a thermoneutral temperature using high-output radiant warmers servocontrolled to anterior abdominal wall skin temperature (T_{abd}). To determine thermoneutral temperature, 17 low birthweight infants recovering from respiratory distress syndrome (BW 1.28 ± .25 kg, EGA 30.7 ± 1.9 wk, age at study 7.5 ± 3.7 days) (mean ± SD) were studied. Oxygen consumption ($\dot{V}O_2$, ml/kg/min) was measured continuously using open-circuit technique for 90 minute study periods at 35.5°, 36.5° and 37.5° C servocontrolled T_{abd}. Mean skin (T_{sk}) and rectal temperatures (T_R), heart rate (HR bpm) and % sleep time were also monitored. Results are summarized below.

	T_{abd}	$\dot{V}O_2$	T_{sk}	T_R	HR	Sleep Time
1	35.5	8.83 ± 3.04[ab]	35.2 ± .26[c]	35.8 ± .8[c]	146 ± 10[c]	71 ± .24%
2	36.5	7.40 ± 2.38[a]	36.3 ± .29[c]	36.6 ± .7[c]	153 ± 12[c]	75 ± .23%
3	37.5	7.57 ± 2.96[b]	37.3 ± .27[c]	37.4 ± .7[c]	159 ± 13[c]	84 ± .14%

a: 1>2, p<.05; b: 1>3, p<.02; c: 1<2<3, p<.01.

Nine infants had T_R > 37.5° and 3 had T_R ≥ 38.0° when servocontrolled to T_{abd} 37.5°C. There was a trend to decreased activity at higher temperatures. 36.5°C was a well-tolerated T_{abd} control-point with a minimal $\dot{V}O_2$ without risk of core hyperthermia. A control-point of 37.5°C should not be used because of the risk of hyperthermia.

†1445 SERUM B 12 AND FOLATE LEVELS IN LBW INFANTS: A REASSESSMENT OF RECOMMENDED INTRAVENOUS SUPPLEMENTS. Jeanne I. Manser, and Nancy L. Brodsky, (Spon. by Hope Punnett). Temple University School of Medicine, Albert Einstein Medical Center, Northern Division, Dept. Pediatrics, Philadelphia

Serum B 12 and folate were measured by RIA in maternal serum, cord blood and at 2 wk intervals in 18 LBW infants (gestational age 29.9 ± 1.9 weeks, birth weight 1.18 ± .26 kg). All infants received parenteral alimentation (PA) (18.8 ± 13.9 days, range 2-51 days) with supplemental B 12 (5 ugm/day) and folate (50 ugm/day) as recommended by the AAP Pediatric Nutrition Handbook (1979). After PA, infants received only B 12 and folate present in formula (1.5-2ugm/l and 50-100 ugm/l). Cord B 12 (805 ± 2.8 pg/ml)and folate (14.6 ± 2.8 ng/ml) were higher (p<.01) than maternal B 12 (464 ± 534 pg/ml) and folate (4.4 ± 4.5 ng/ml). (Adult normals: B 12 >250 pg/ml, folate > 4 ng/ml). At two wks B 12 and folate were higher than cord levels (p<.01); 88% of B 12 levels > 2000 pg/ml and 75% of folate levels > 20 ng/ml. B 12 (100% > 2000pg/ml) remained > cord B 12 (p<0.01) throughout 6 wks PA. Folate (60% >20ng/ml) remained > cord folate (p<0.01) for 4 wks PA. B 12 and folate obtained 6 to 8 weeks after discontinuation of PA remained higher than cord B 12 and folate (p<0.01). Median B 12 1520 pg/ml and 100% folate levels were still > 20 ng/ml. Changes in B 12 and folate levels did not correlate with Hgb, rate of growth, length of PA or length of po feeds. LBW infants who receive at least two days of PA with B 12 and folate supplementation do not need oral supplements beyond what is present in formula. We conclude that the present recommended intravenous supplements of B 12 and folate are excessive and that lower levels of supplementation need to be assessed.

1446 MODERATE LEVELS OF HYPERBILIRUBINEMIA DO NOT INFLUENCE THE BEHAVIOR OF JAUNDICED INFANTS. Paludetto R., Mansi, G., Rinaldi P., Ariola P., Cascioli, C.F. (Spons. by J.H. Kennell). Neonatal Unit, 2nd School of Med., Naples, Italy.

Recently several reports have suggested some short-term effects of moderate hyperbilirubinemia questioning the treatment protocols used for neonatal jaundice. The majority of these studies were not designed to tease out the effects of phototherapy. In our study with the Brazelton Neonatal Behavioral Scale we evaluated a group of 17 heathy moderately jaundiced term infants (mean bilirubin level 10.6 mg/100ml, range 8.4-14.3) not treated with phototherapy compared to 17 not jaundiced matched subjects on the 3rd day of life. No differences were found between the 2 groups. On the 4th day of life we evaluated 14 jaundiced subjects (mean bilirubin level 10.4 mg/100ml, range 8.4-12.9) and 14 not jaundiced matched infants and again we did not find any differences. At one month of age, 10 ex-jaundiced infants (mean bilirubin level 11.5mg/100ml,range 9.1-15.9) and 10 matched not jaundiced subjects were available, and still no differences were found between the 2 groups. Our data therefore indicate that moderate levels of hyperbilirubinemia do not influence neonatal behavior. Therefore we do not advocate more aggressive treatment protocols at least for term infants.