1351 MEASUREMENT OF BODY SURFACE AREA (BSA) IN PREMATURE INFANTS (PT). Luc Brion, Alan R. Fleischman, George J. Schwartz, Albert Einstein College of Medicine, Dept. Peds., Div. Neonatol. and Nephrol., Bronx, New York.

BSA is an important factor in caloric expenditure, fluid and drug management and assessment of GFR. Formulas designed for adults, children and infants have not been validated in PT. We performed 91 measurements of BSA in 70 PT of 3 gestational age (GA) groups (max 1 measurement per wk, per infant), using a geometric method (considering the body as a series of cylinders and the head as a sphere) that has been derived for older infants, children and adults (Haycock, et al., J. Ped. 93:62, 1978). We compared the geometric values to those obtained by 4 length-weight formulas based on BSA (m^2)=a L^bW^c, where L is the body length (cm), W is the weight (kg) and a/b/c are respectively: for Haycock's: .024265/.3964/.5378, for Dubois': .007184/.7258/.425 for Gehan's: .02350/.42246/.51456 and for Boyd's: .017827/.500/.4838. The mean differences (Geometric- a $L^bW^c \pm$ SE) between BSA obtained by geometric measurement and by each formula are shown:

GA	n	Haycock	Dubois	Gehan	Boyd
25-28	35	-2.7 ± .6**	-.2 ± .8	-9.1 ± .7**	-9.8 ± .8**
29-32	36	-1.5 ± .4**	2.1 ± .5**	-7.1 ± .5**	-7.2 ± .5**
33-36	20	-1.0 ± .9**	2.2 ± 1.1*	-7.0 ± .9**	-7.0 ± 1.0**

(Mean Difference ≠ 0: * p < 0.05; **p< 0.01)

The mean BSA obtained by Gehan's and Boyd's formulas overestimate the measured BSA by 7% or more, whereas the 2 other formulas give an error less than 3%. Therefore, Dubois' or Haycock's formula may be used in PT. Since Dubois' substantially overestimates BSA in larger infants and children, Haycock's formula is recommended for use in the general pediatric population, including PT and very low birth weight infants.

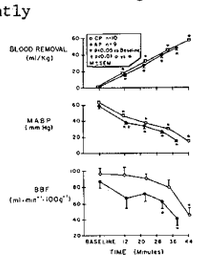
1352 HYPERKALEMIA (HK) IN VERY LOW BIRTH WEIGHT INFANTS (VLBW) WITH NON OLIGURC RENAL FAILURE. Luc Brion, Alan R. Fleischman, George J. Schwartz, Albert Einstein College of Medicine, Dept. of Pediatrics, Div. of Neonatol. and Nephrol., Bronx, New York.

HK is a frequent complication of acute renal failure (ARF), but is uncommon without oliguria. 7 out of 134 VLBW born during a period of 17 months presented with HK (K^+ > 7 mEq/l) confirmed in non-hemolyzed specimens during the first 3 days of life, and urine output > 0.5 ml/kg/h. Their BW, GA and Apgar scores at 1 and 5 min were respectively: median (range): 850 gm (620-1050), 27 wk (25-28), 5 (1-8) and 6 (2-10). They presented with HK and/or arrhythmias (ventricular premature beats, sine waves) at 9-70 h, associated with: IVH (6 pt), previous transfusion (4), hematuria (2), and indomethacin, hypotension, sepsis and bowel necrosis in 1 pt each. Other biochemical measurements included: Na 143 mEq/l(124-158), bicarbonate 18 mEq/l (16-22), BUN 25 mg/dl (7-44), plasma creatinine 1.4 mg/dl (1.1-2.6), pH 7.32(7.29-7.39) and Ucr/Pcr 7.3 (1.6-10). The plasma creatinine increased subsequently during the first wk of life by 0.4 mg/dl (0.1-1.1) up to a maximum of 1.7 mg/dl (1.2-3.7) with an estimated GFR by 0.3 L/Pcr (L=body length, cm) of 6.5 ml/min/1.73m^2 (3.0-6.8). Polyuria developed in 4 pts: 3.9 ml/kg/h (2.3-6.9). HK was corrected within 2 days (0.5-6 days) using Kayexalate enemas and combinations of glucose, insulin, calcium, bicarbonate and furosemide. 3 pt. died at 2-4 wk of age from causes other than HK.

We conclude that VLBW in the presence of mild renal impairment are at risk for early HK even in the absence of oliguria. The significant morbidity and potential mortality requires increased vigilance in monitoring plasma K^+ in VLBW during the first 3 days of life.

†**1353** ATROPINE (AT) REDUCES BRAIN-BLOOD FLOW (BBF) AT LOWER MEAN ARTERIAL BLOOD PRESSURES (MABP) DURING HEMORRHAGIC HYPOTENSION (HH) IN THE NEWBORN PIGLET (P). Ann-Mari Brubakk, William Oh, Barbara S.Stonestreet. Brown Univ. Dept. Ped., Women & Infants Hosp., Providence, RI.

We have previously shown that AT pretreatment modifies autoregulation of BBF during hypertension in the newborn P. During HH, AT may also prevent cerebral vasodilation (CV), thus resulting in a greater reduction in BBF at a higher MABP, than without AT treatment. HH was induced by graded phlebotomy in 19 P (9 treated with AT sulfate, 0.02 mg/kg (AP); 10 served as controls (CP). BBF (microsphere method) and MABP were measured. AT treatment resulted in a lower (p<0.01) MABP in AP than CP during early HH, however, there was no significant change in BBF in either group. When the MABP was 30 and 27 mmHg for CP and AP respectively, BBF was significantly (p<0.05) decreased in AP and not in CP. BBF was decreased significantly (p<0.05) in both groups at a MABP of 15 mmHg. We conclude that AT may limit CV at the lower end of the autoregulatory range, resulting in a pressure passive fall in BBF which occurred at a higher MABP in piglets treated (AP) compared with those not treated with AT (CP).



=**1354** ADAPTATION OF BRAIN BLOOD FLOW (BBF) TO PROLONGED HYPERCARBIA (PHC) IN THE NEWBORN PIGLET (P). Ann-Mari Brubakk, William Oh, Barbara S. Stonestreet, Brown Univ., Women & Infants Hosp., Dept. of Ped., Providence, RI.

In adult animals, hypercarbia-induced cerebral hyperemia may recede to normal, possibly because of the modulating effect of normalization of brain tissue pH (BtpH). Furthermore, if BtpH normalizes during PHC, a further reduction in BBF (below baseline (B)) may occur during the recovery (normocarbia, (NC)) phase. To test these hypotheses, 7 awake P's were exposed to PHC ($PaCO_2$ 60-70) for 4 hrs., followed by 3/4 hr. of NC. BBF (microsphere method, $ml \cdot min^{-1} \cdot 100g^{-1}$), BtpH (Roche glass electrode) and blood gases were measured during B, ½, 2 & 4 hrs. of PHC and ¼ & 3/4 hrs. during the NC recovery phase. Results appear below (M±SD):

Baseline		Hypercarbia			Normocarbia	
Hrs.	0	½	2	4	¼	3/4
$PaCO_2\Delta$	40±5	66±5*	68±4*	67±4*	45±1*	43±4
BtpH	7.24±.07	7.03 ±.03*	7.05±.04*	7.07±.08*	7.22±.05	7.22±.07
BBF	87±17	219±61*	209±70*	166±36*+	102±29	103±22

ΔmmHg., *p<.05 vs Baseline, +p<.05 vs ½ hr. Hypercarbia

BBF increased significantly during PHC; at 4 hrs. of PHC a slight reduction of BBF was observed when compared to the ½ hr. PHC value. BtpH was significantly reduced throughout PHC. During NC, BBF and BtpH were similar to B values. We conclude that in newborn P, the PHC results in persistent cerebral hyperperfusion resulting from a lack of BtpH normalization.

1355 CHLAMYDIA TRACHOMATIS (Ct) PNEUMONITIS IN PREMATURE INFANTS. David J. Burchfield, Peter D. Reuman, Richard L. Bucciarelli, Elia M. Ayoub, Dept. of Pediatrics, Univ. of Florida, Gainesville, FL.

Although Ct is recognized as a common etiologic agent in infant pneumonia, its role in pulmonary infection of premature infants has received little attention. Eight premature high risk babies hospitalized in our intensive care nursery over a 9 month period were documented to have Ct pneumonitis by standard McCoy cell tissue culture of endotracheal tube aspirates (7 patients) or nasopharyngeal swab (1 patient). All patients had negative CMV urine cultures. Birthweights ranged from 610-2200 g. and gestational ages from 26-34 weeks. Six patients were born vaginally and 2 by Caesarean section. Age ranges at time of Ct isolation was 8-83 days (mean 29 days). All patients were cultured during an acute worsening of their respiratory status; 7 showed acute changes on chest X-ray.

Seven patients were treated with erythromycin for 3 weeks; the remaining patient died prior to Ct identification. Five patients died of respiratory failure, 1 patient is at home on oxygen therapy for chronic lung disease and 2 patients have no residual lung disease. During this same time period, there were 8 infants of similar gestational age, birthweight, chronological age and mode of delivery whose endotracheal aspirate culture was negative for Ct. All these infants have survived.

Chlamydia trachomatis appears to be associated with severe pulmonary disease in premature infants. Ct pneumonitis should be considered in a premature high risk infant with worsening respiratory status.

1356 THE EFFECT OF PHENOBARBITAL (PB) ON CEREBRAL BLOOD FLOW VELOCITY (CBFV) FOLLOWING ENDOTRACHEAL SUCTION (ETS). Gary H Burgess, Benjamin S Brann IV, Barbara S Stonestreet, William Oh, Ann-Mari Brubakk. Brown Univ., Women & Infants Hosp., Dept. of Ped., Providence, RI.

ETS produces a transient fall in PaO_2 and a rise in mean arterial blood pressure (MABP). PB may decrease the neonatal response of CBFV as a result of ETS. 7 infants, mean birthweight 819g and mean gestational age of 27 wks, were studied in the first 20 hrs of life. Area under the velocity curve (AVC), peak systolic velocity (PSV), and end diastolic velocity (EDV) were measured with a doppler velocimeter before (C) and after (S) ETS at 3 time periods: prior to PB (baseline: 0), 2 hrs after and 4 hrs after an i.v. dose of 20 mg PB/kg. Heart rate, mean arterial blood pressure (MABP) and transcutaneous PO_2($TcPO_2$) were measured simultaneously with the doppler determinations.

Hrs after PB	0		2		4	
	C	S	C	S	C	S
MABP (mmHg)	36±3	40±3*	33±3	35±3	32±2	33±3
$TcPO_2$ (mmHg)	74±4	52±7*	64±4	51±4	75±6	59±8*
ΔAVC^2 (%change)	18±9		6±11		-13.5±8#	

M±SEM, *p<0.05 vs C, #p<0.05 vs time 0, ΔAVC=S-C/Cx100

There were no changes at any time with PSV (values: 7.4 cm/sec) and EDV (values: 2.1 cm/sec). As shown above, ETS produced a significant rise in MABP and a fall in $TcPO_2$. Four hours following PB treatment, the percent change in ΔAVC associated with ETS was reduced. We speculate that PB may modulate the response of ΔAVC to ETS.