1302 EFFECT OF DELIVERY ROOM CARE ON SURVIVAL AND OUTCOME OF LOW BIRTH WEIGHT INFANTS. Virginia D. Black, Lula O. Lubchenco, L. Joseph Butterfield, and Beverly I. Koops. Wayne State University, University of Colorado, Hutzel Hospital, Denver Children's Hospital, Departments of Pediatrics, Detroit, Denver.

Neonatal survival of very low birth weight (VLBW) infants (600-999 grams) and long-term outcome of low birth weight (LBW) infants (600-1499 grams) are correlated with optimal delivery room (DR) management. Over a 4-year period, 335 LBW infants were born alive at UCHSC. Of these, 108 were VLBW. Intrapartum and resuscitation management were reviewed and rated. "Optimal delivery care" was defined as appropriate intrapartum care and a controlled, uncomplicated delivery. "Optimal resuscitation" required that a team be present at delivery and encounter no technical problems. Optimal delivery room (DR) management occurred when both obstetric and pediatric care were appropriate. Adequate information was available to rate 80% of cases. Survival of VLBW infants was significantly improved with optimal DR care ($p < 0.05$). DR care had the greatest impact on 700-999 grams infants. In this group, 68% of survivors had "optimal care" while only 31% of the neonatal deaths (ND) had "optimal care" ($p < 0.01$). Neonatal deaths also occurred later with optimal DR care ($p < 0.02$). Unavoidable obstetrical complications occurred in 14 deliveries of VLBW infants (11 ND and 3 survivors) ($p < 0.05$). All of the survivors had optimal resuscitation. Only 1 of the 3 survivors was normal at follow-up. Vaginal breech delivery of LBW infants had a significant neonatal mortality compared to vertex vaginal delivery ($p < 0.01$) or breech C-section delivery ($p < 0.02$). Optimal DR management was also associated with normal long-term outcome for LBW infants. Fifty percent with optimal DR care and 30% without were normal at follow-up ($p < 0.05$). With improvement in Newborn Intensive Care, the effects of intrapartum and delivery room management can now be measured in both neonatal survival and long-term outcome. These findings have special significance for level I hospitals who transport LBW infants after delivery and stabilization.

●1303 INTRAVENOUS LIPID INFUSION INCREASES LUNG FLUID FILTRATION IN LAMBS. William G Teague, David Braun, Robert B Goldberg, and Richard D Bland. Cardiovasc Res Inst, Dept of Pediatrics, Univ of California, San Francisco.

In adult sheep intravenous infusion of a 10% lipid emulsion at an hourly rate of 0.25 g/kg body weight increases pulmonary microvascular pressure and filtration of fluid into the lungs, causing pulmonary lymph flow to double (J Clin Invest 61:1291, 1978). As 10% lipid usually is administered at lower rates in infants, some of whom have lung disease, we tested the effect on lung fluid balance of a continuous parenteral infusion of 10% fat emulsion at an hourly rate of 0.125 g/kg in healthy, awake newborn lambs. We measured mean pulmonary arterial ($\bar{P}pa$) and left atrial ($\bar{P}la$) pressures, arterial blood gas tensions (PaO_2 and $PaCO_2$), lung blood flow ($\dot{Q}_b$) and lymph flow ($\dot{Q}_l$), and protein concentrations in lymph (PR_l) and plasma (PR_p) of 5 lambs, 1 to 3 wks old. After a 2-3 h infusion of isotonic saline (control), the lambs received an infusion of 10% lipid for 3-4 h at the same rate as the preceding saline. Results ($\bar{X} \pm s_{\bar{x}}$; *$p < 0.05$):

Period	$\bar{P}pa$	$\bar{P}la$	PaO_2	$PaCO_2$	$\dot{Q}_b$	$\dot{Q}_l$	$PR_l:PR_p$
	-- torr --		--- torr ---		l/min	ml/h	
Control	16 ± 1	1 ± 1	84 ± 9	40 ± 2	2.4 ± .3	2.3 ± .7	.65 ± .10
Lipid	21 ± 4*	1 ± 1	73 ± 11*	40 ± 2	2.3 ± .4	3.9 ± 1.6*	.55 ± .10*

Lipid infusion at a rate suitable for infants increased pulmonary microvascular pressure and lung lymph flow, and decreased lymph protein concentration, suggesting that intravenous fat causes constriction of the pulmonary circulation distal to sites of microvascular fluid exchange in lambs. Lipid infusions may thereby contribute to lung edema and impair arterial oxygenation.

1304 ABSENCE OF PHOSPHATIDYLGLYCEROL IN AMNIOTIC FLUID OF BABOONS AT TERM. YW Brans, TJ Kuehl, RH Hayashi, DL Shannon, The University of Texas Health Science Center at San Antonio and Southwest Foundation for Research and Education, Departments of Pediatrics & Obstetrics and Gynecology, San Antonio.

89 samples of amniotic fluid were obtained from 46 pregnant baboons at 91 to 176 days of gestation (term = 180 days). In 8 baboons delivered by cesarean section at 174-176 days of gestation, the entire amniotic fluid contents of the uterus were aspirated and lung lavage was performed within 1 hour of birth. Surfactant was purified from these 8 amniotic fluids and products of lung lavage by differential and density-gradient centrifugation. Lecithin/sphingomyelin ratios ranged from 0 to 2.41. Mean (±SD) L/S ratio at term was significantly higher than before term (0.77±0.55 vs 0.28±0.25, $p<0.001$). Of 12 samples obtained after 170 days of pregnancy, only 6 had L/S ratios greater than 1 and only 1 had a ratio in excess of 2. The relation between L/S ratios and gestational maturity was best described as a second order polynomial ($r=0.63$, $p<0.001$). Phosphatidylglycerol (PG) was detected in none of the amniotic fluid samples. Of the 8 surfactants purified from amniotic fluid at term, none contained detectable amounts of PG. Yet, 6 of 7 surfactants purified from products of lung lavage did contain PG. These data suggest 3 possibilities: (1) baboon fetuses make no PG; (2) PG is present in amniotic fluid, but in concentrations too low to be detected; or (3) PG is present in the lungs but is not excreted into amniotic fluid. The third explanation appears to be most likely.

1305 SIMULTANEOUS STUDIES OF UNBOUND BILIRUBIN AND BILIRUBIN BINDING MEASUREMENTS USING TWO (2)AUTOMATED MICROMETHODS. Audrey K.Brown, Yoshitada Yamauchi Gerard J.Boyle&Barbara Delivoria. SUNY-Downstate Med.Cntr., Dept. of Pediatrics, Brooklyn, NY.

Use of 2 automated instruments, the UB Analyzer (Nakamura) and the AVIV Hematofluorometer has allowed us to examine unbound bilirubin values and bilirubin binding measurements simultaneously in 79 infants (142 samples). The UB Analyzer employs a modified peroxidase micromethod to measure unbound bilirubin (UB); results compare well with the manual peroxidase method ($r=0.87$, $p=0.001$). The AVIV Hematofluorometer depends on the fluorescence of albumin bound bilirubin. Bound bilirubin(B), total blood bilirubin(T) and reserve binding (R) are measured, as is B/R, (the degree of saturation of albumin binding sites). T-B can be calculated and represents bilirubin in blood not bound at the primary albumin binding site. Simultaneous performance of these measurements was possible in very LBW Infants since each method required 100µl blood. UB correlated directly with TB In all birthweight groups ($r=0.69$, $p=.0001$, $n=142$) and was markedly increased in infants of BW≤1000 g compared with those >1000 g at given bilirubin levels. UB correlated best with B/R ($r=0.82$, $p=.0001$, $n=142$) in all birthweight groups. The relationship between UB & T-B varied with BW and became striking in infants <1000 g ($r=0.95$, $p=0.0001$, $n=19$). Comparison of measures of albumin binding with that of UB has been limited. New insights have been gained by the ability to study these interrelationships in LBW Infants using two simple automated micromethods.

1306 CARDIOPULMONARY SUPPORT FOR NEONATAL MASSIVE PULMONARY HEMORRHAGE (MPH). Andrew Coe, Warwick Butt, Yashu Coe, Jeffrey Smallhorn, Jonathan Hellmann (Spon. Paul R. Swyer). Dept. of Pediatrics, U of Toronto, Res Inst and Divs of Perinatology and Cardiology, Hosp for Sick Children, Toronto.

MPH is a condition associated with very high mortality. In 1981 in our Unit 7/8 neonates with MPH died. MPH was defined as hypoxemia(PaO_2 40 in FiO_2 .9)with fresh blood from the endotracheal tube & compatible chest X-ray features. Pathophysiologically MPH was considered as hemorrhagic pulmonary edema secondary to left ventricular dysfunction.[1] We therefore attempted to improve left ventricular function by optimising ventilation (muscle relaxants, sedation, positive end expiratory pressure 8-10 cm H_2O, high mean airway pressure 18-25) & improving myocardial contraction(Dopamine 5-10mcg/kg/min ± Isuprel 0.1 - 0.3mcg/kg/min). 5 patients have been successfully managed with this protocol. Also, ventricular function was assessed in 2/5 patients with M-mode echocardiogram & showed improvement in left ventricular ejection fraction & resolution of paradoxical septal motion.

	N	Died	Birth Wt.	Gestation	SGA	MPH hr.	DIC	Birth Asphyxia
1981	8	7	2.15 (790-3880)	34 (25-40)	2	20 (2-60)	4	7
1983	6	1	2.14 (740-4180)	36 (24-41)	3	27 (4-72)	4	4

We suggest that aggressive cardiopulmonary support including inotropes can alter the previous poor prognosis of MPH.

[1]Cole: Pediatrics 512: 175-187, 1973.

1307 COMPLICATIONS OF ARTERIAL CATHETERS - RETROGRADE FLOW AND HYPERTENSIVE PEAKS. Warwick Butt, Robert Gow, Hilary Whyte, Jeffrey Smallhorn (Spon. Paul R. Swyer). Dept. of Pediatrics, U of Toronto, Divs of Perinatology and Cardiology, Hosp. for Sick Children, Toronto.

Arterial catheters are now an integral part of intensive care medicine & provide the capacity for continuous blood pressure measurement & the ability to perform frequent blood gases. However these catheters potentially have a number of complications including infection, hemorrhage, ischemia & embolisation. We investigated whether retrograde flow occurs with routine flushing of these catheters & if so whether it was associated with alterations of blood pressure at sites distal to the flushing point. We studied 14 patients whose weights ranged from 680-4180 g, gestation 24-41 wks, day to study 1-60 with 5 radial, 7 umbilical & 2 posterior tibial catheters. On flushing of the catheter with saline, following routine blood gas, ultrasound exam showed retrograde flow of "microbubbles" into the aortic arch, carotid artery & superior mesenteric in all patients. Also, pressure transmission was recorded with increases in peak systolic & diastolic pressures of 5.7-40% above basal lines. Variability of pressure transmission depended on the volume and speed of injection with respect to the phase of the cardiac cycle, & the intrinsic flow characteristics of the particular infant. Both retrograde flows of saline ± fibrin aggregates, & hypertensive peaks may have important implications in the pathogenesis of intraventricular hemorrhage & necrotising enterocolitis. With low volume (0.5 cc) + slow injection (10sec) neither "microbubbles" were seen, nor pressure transmission recorded.