1432 TREATMENT OF NEONATAL CHRONIC LUNG DISEASE WITH FUROSEMIDE. Susan Sniderman, Ronald I. Clyman, Mona Chung, Robert Roth and Roberta A. Ballard. Mt. Zion Hospital and Medical Center, Dept. of Peds., San Francisco, Ca.

Long term furosemide therapy has been recommended for neonatal chronic lung disease. 28 preterm infants (986±60 gm) with stable or worsening chronic lung disease due to bronchopulmonary dysplasia or chronic pulmonary insufficiency of the premature were treated with 1-2 mg/kg q 6 hours of furosemide. Infants entered this prospective study if they required mechanical ventilation for >2 wks or for FiO_2 of>.4,>.3 or>.21 at 3, 4 or 6 wks of age, respectively. Infants were evaluated using a computerized score based on peak ventilator pressures, end expiratory pressures, ventilator rate, FiO_2 and $PaCO_2$. Each infant acted as his own control. If he responded initially, therapy was discontinued after 7 days and he was evaluated for deterioration. 20/28 infants showed significant improvement ($p<.010$) when treated with furosemide. There were no significant differences between responders (n=20) and nonresponders (n=8) in mean gestational age (28.2 vs 28.5 wks), birth weight, male-female distribution, age at start of study, or type of chronic lung disease. 12/20 responders had a significant deterioration in their respiratory scores when therapy was discontinued. 21/28 received a second trial of furosemide: 14/21 responded to retreatment. An infant's response in the second trial was independent of his response in the first trial. Brief periods of furosemide therapy may be useful in the management of chronic lung disease in some preterm infants, but prolonged continuous use needs further evaluation.

●1433 PROSTAGLANDIN D2 (PGD2) DECREASES HYPOXIC PULMONARY HYPERTENSION IN NEWBORN LAMBS. Scott J. Soifer, Frederick C. Morin, Christine Roman, & Michael A. Heymann. Univ. of Calif., S.F., CA. Dept. of Ped. and the CVRI.

Prostaglandins may be important in regulation of the postnatal decrease in pulmonary vascular resistance (PVR). We investigated the effect of PGD2 on PVR in 5 unanesthetized near term lambs delivered by ceasarean section. Under local anesthesia tracheostomy and ductal ligation were performed; left and right atrial, pulmonary arterial (PA) and aortic (AO) catheters were placed, and an electromagnetic PA flow transducer was positioned. The lambs received 5 mg indomethacin during and at the end of surgery. They were ventilated with a mixture of air and N2 to produce PO2's in the 10-36 torr range. All lambs developed pulmonary hypertension with PA equal to AO pressure. They were given bolus injections into the PA of PGD2 in increments of 0.1 - 100 ugs. Each exhibited a dose related fall in PA pressure and increase in cardiac output (CO) without change in AO pressure. At 20 ugs, beyond which there was little change in effect, PA pressure fell by 28.7 ± 10.2% SE, CO increased by 48.3 ± 28.2%, and AO pressure increased by 3.1 ± 8.3%. At all doses PVR fell further than systemic vascular resistance (SVR). At the 20 ug dose PVR fell by 51.9 ± 13.3% while, SVR fell by 29.2 ± 12.5% due to the large increase in CO. Under these conditions PGD2 has a powerful and specific effect on PVR. This specificity may be important in the regulation of PVR at birth and in treatment of persistent pulmonary hypertension.

1434 COLLOID OSMOTIC PRESSURE OF NORMAL NEWBORNS AND PREMATURE INFANTS. A. Sola, G. Gregory, University of California, San Francisco, Dept. of Anesthesia, Pediatrics and Cardiovascular Research Institute, San Francisco.

Colloid osmotic pressure (COP) is an important regulator of fluid movement and can now be measured simply and reliably. We used the 4100 Wescor Colloid Osmometer to define COP values and its relation to total protein concentration (TP) in different groups of newborns. The mean COP (torr ± S.D.) was 19.38 ± 2.17 in 99 term infants delivered vaginally and 16.0 ± 2.07 in 40 term infants delivered by cesarean section ($p<0.005$). The lowest COP (14.9 ± 1.8) was in those born operatively without preceding labor. COP correlated well with TP (r=0.92) in term infants. In 60 sick preterm infants with 362 determinations, COP (12.46 ± 2.45) was different from term infants ($p<0.001$) and the correlation with TP was poor (r=0.64). Different therapeutic modalities affected COP widely. Crystalloid infusion (10-20cc/kg) decreased COP by 22% and surgery by 32%. COP increased 63% after exchange transfusion, 23% after infusion of plasma (10-20cc/kg) and 15% one hour after Furosemide administration.

We conclude that COP varies not only with gestational age but also with mode of delivery, experience of labor and therapy. In critically ill preterm neonates, since estimations from TP are inadequate, the only way to obtain a quantitative measure of COP is by direct measurement. Repeated COP measurements will permit precise selection of fluid therapy and warn of changes that may lead to pulmonary edema.

1435 COMPARISON OF INTRA-ARTERIAL (IA) AND NON INVASIVE BLOOD PRESSURE (BP) MEASUREMENTS IN SICK NEWBORNS (NB). A. Sola, F. Mather, L. Steddum, M. Leitner, C. Kapadia, J. Gershanik, (Spon. by G. Gregory), Southern Baptist Hospital, Dept. of Neonatology and Dept. of Biostatistics and Epidemiology, Tulane University, New Orleans.

Monitoring of BP is necessary for the care of sick NB. A simple, accurate, non invasive method for measuring BP almost continuously would be of great advantage and should reduce the frequency and duration of IA BP monitoring. In 18 critically ill NB, wgt: 840-3460gms.; Gest. Age: 28-42 wks, DX: RDS (13), PFC (2), Asphyxia (2), Sepsis (1),we compared the mean (M), Systolic (S) and Diastolic (D) BP recording from an automatic sphygomomanometer (Dinamap) to the simultaneous IA BP every 4 hours (n=279).

Linear regression of peripheral vs. IA mean values (n=18) showed a significant correlation (MBP-r=.96; SBP-r=.96; DBP-r=.98) and slope not significantly different from 1. Average values of the mean differences between peripheral and IA BP were near zero (n=279; MBP=0.5; SBP=0.2; DBP=1.6). Analysis of variance of the individual peripheral - IA differences showed significant variability within and between patients ($p<.001$). Overall, the within patient variability (±SD) was 12, 16 and 13 torr for MBP, SBP and DBP respectively. Between patient variability was only slightly lower.

In conclusion, when a series of measurements are made & averaged, the automatic sphygomomanometer correlates well with IA BP and could be useful for the longitudinal monitoring of sick NB. However, using only a few peripheral determinations could be misleading in estimating the IA BP, due to the large variability.

1436 A PROSPECTIVE CONTROLLED STUDY OF NASOTRACHEAL VERSUS OROTRACHEAL TUBES IN THE NEONATE. Alan R. Spitzer and William W. Fox. Dept. of Peds., Univ. of Pa. Sch. of Med. and Children's Hospital of Phila., Phila. PA.

Previous studies in older children have suggested that nasotracheal (NT), as compared to orotracheal (OT), endotracheal tubes remain fixed for longer periods of time without retaping or replacement and have fewer complications. To determine if these findings were valid for neonates, 86 consecutive admissions to the IICU of Children's Hospital of Philadelphia were prospectively studied. All required intubation >48 hrs. Mean birthweights were: OT - 1895±112 gms. SEM; NT - 1903±143 gms. SEM (NS). Mean gestational ages were: OT - 32.1±0.6 wks. SEM; NT - 32.9±0.5 wks. SEM (NS). Mean duration of intubation was similar: OT - 309.8±88.7 hrs. SEM; NT - 322.5±65.4 hrs. SEM (NS). During the period of intubation, there was no difference between frequency of tube retaping (OT-every 60.1±4.3 hrs. SEM; NT-every 64.7±7.7 hrs. SEM) or frequency of tube replacement (OT-every 109.3±9.0 hrs. SEM; NT-every 122.4±12.1 hrs. SEM). The incidence of pneumothorax was 4/43 (9.3%) with OT tubes and 3/43 (7.0%) with NT tubes (NS). Bacterial colonization occurred in 18.6% in the OT group and 39.5% in the NT group, but the difference was not statistically significant. Other problems occurred in 10 infants: 2 could not be nasally intubated; 4 with NT tubes developed nasal erosions; 3 babies with OT tubes developed palatal grooves. This study suggests that NT tubes offer no advantages over OT tubes in the neonatal period, either for stability or frequency of complications.

1437 POST-EXTUBATION ATELECTASIS - THE ROLE OF NASAL VERSUS ORAL ENDOTRACHEAL INTUBATION. Alan R. Spitzer and William W. Fox. Dept. of Peds., Univ. of Pa. Sch. of Med. and Children's Hospital of Phila., Philadelphia, PA.

To determine whether a particular type of endotracheal (ET) tube plays a role in post-extubation atelectasis, 86 consecutive admissions to the IICU of The Children's Hospital of Philadelphia were prospectively studied. All required >48 hrs. intubation. The infants were admitted for the following conditions: 70(81.4%)-respiratory distress syndrome; 5(5.8%)-apnea; 4(4.6%)-birth asphyxia; 3(3.5%)-persistent pulmonary hypertension; 3 (3.5%)-sepsis; 1(1.2%)-congenital anomalies (non-respiratory). Infants were assigned randomly to either an oral (OT) or nasal (NT) endotracheal tube for their entire hospitalization. Mean birthweights were: OT 1895±112 SEM gms.; NT 1903±143 SEM gms. (NS). Mean gestational ages were: OT 32.1±.6 SEM wks.; NT 32.9 ±.5 SEM wks. (NS). Fifteen of 43 (34.9%) of infants in the NT group developed post-extubation segmental or lobar atelectasis, whereas 5/43 (11.6%) of infants in the OT group had post-extubation atelectasis ($p<.025$). Eleven of the NT babies (25.6%) and five (11.6%) of the OT babies required reintubation (NS). This study suggests that nasal ET tubes result in a significantly increased incidence of post-extubation atelectasis in the neonate as compared to oral ET tubes. Since the human newborn is an obligate nose breather, nasal intubation for greater than 48 hrs may lead to significant edema and increased upper airway resistance after extubation. Oral ET tubes, especially for the premature baby with RDS, may therefore be the preferred route of intubation.