151 CONTINUOUS PULMONARY ARTERY PRESSURE MONITORING IN PERSISTENT PULMONARY HYPERTENSION OF THE NEWBORN. George J. Peckham, William W. Fox, Marta Blesa (Spon. by William J. Rashkind) Univ of Pa. Sch. of Med., Dept. of Peds. and The Children's Hospital of Philadelphia, Philadelphia, PA.

During the past year, we have monitored continuous pulmonary artery pressure in 9 critically ill newborns (weight range 2.2 to 4.4 kg and gestational age 36 to 43 weeks) with persistent pulmonary hypertension (PPAH). Indications for monitoring were 12 to 24 hours of PaO2 <60 on 100% inspired oxygen and suprasystemic pulmonary hypertension at cardiac catheterization. Cardiac catheterization data on these patients showed right to left shunting at the foramen ovale and/or ductal level with pulmonary artery pressure (PAP) greater than systemic arterial pressure (SAP) by a mean of 21.0 mm Hg (P<0.05). NIH #5 catheters placed by saphenous vein cutdown remained in position after fluoroscopic confirmation of location. SAP was obtained from indwelling umbilical or radial arterial catheters. SAP and PAP were displayed at bedside on digital readouts and continuously recorded on a computerized trend recording. Catheters remained in place for a range of 24 to 336 hours (mean 112 hours) and were removed after PaO2 >50 mm Hg on 60% inspired oxygen. Eight patients survived and two patients had local infections at the cutdown site. PAP levels permitted regulation of specific therapy for pulmonary hypertension (correction of pH and intrapulmonary artery tolazoline in 7/9). In critical situations where PPAH is the principle cause of severe hypoxemia in neonates, this selective approach for documentation of response to therapy is warranted.

152 DETERMINATION OF HUMAN NEONATAL MEAN ARTERIAL BLOOD PRESSURE PRIOR TO UMBILICAL CORD CLAMPING AND PREDICTABLE SEQUENTIAL CHANGES IN THE FIRST HOUR OF LIFE Ronald M. Perkin, Maynard B. Ramsay, and John S. Curran (Spon. by Lewis A. Barness) University of South Florida College of Medicine, Department of Pediatrics, Tampa, Florida

Non-invasive mean arterial blood pressure determinations in twenty-five normal term unmedicated newborn infants from the moment of birth until the end of the first hour of life were performed by a semi-automated electronic oscillometric method. The infants were divided into two groups: A-19 infants with cord clamped at mean = 80 seconds and B-6 infants with cord clamped at a mean = 10.3 seconds.

			Time after cord clamping (min.)				
		Pre-clamp	1	2	10	15	60
Mean Art. Press.	A	56.3	69.5	58.2	49.1	59.0	49.6
(mm.Hg)	B	-	-	74.3	46.5	48.5	44.5
Std. Error	A	2.5	2.5	2.6	2.1	2.6	1.1
(± mm.Hg)	B	-	-	7.0	1.7	3.0	1.2
p						<.05	<.01

Mean arterial blood pressure curves plotted vs. time demonstrated four phases: (1) Primary rise-first 1-2 minutes, (2) Early fall-second to tenth minutes, (3) Secondary rise-tenth to fifteenth minutes, (4) Stabilization after fifteen minutes. The sequence demonstrated is highly suggestive of a functioning autonomic nervous system with chemoreceptor and baroreceptor input from birth. Early clamped infants consistently demonstrated lower pressures after the third minute of life.

153 ADVANCES IN PERMANENT PACING, William W. Pinsky Paul C. Gillette, and Dan G. McNamara, Baylor College of Medicine & Texas Children's Hospital, Deptartment of Pediatrics (Cardiology) Houston.

Four areas of improvement in pacemaker (P) design and application provide the potential for more effective permanent pacing: 1. Use of lithium power source (LP); 2. Use of rechargeable batteries (RP); 3. the use of atrial epicardial leads (AP) for sick sinus syndrome (SSS); and 4. atrial sequential pacemaker (ASP) for use in complete AV block (CAVB) when atrial augmentation of cardiac output is needed. The purpose of this report is to present the experience in 20 pts, 8 days to 24 years, mean 11 years of age, using these new pacing techniques. The treatment has been evaluated with respect to desired result, duration of effectiveness and acceptability to the patient and parents. Lithium AP was used successfully in 3 pts with SSS and normal AV conduction, although 1 pt still has intermittent tachydysrhythmias. Ventricular P were used in 2 pts with SSS and abnormal AV conduction and in 13 pts with CAVB. There were 11 LP and 4 RP, all of which have functioned without a battery failure; duration of use: LP 1-31 mos, mean 13.7 mos, and RP: 21-37 mos, mean 27.3 mos. Pacing has been effective with complications in only 2 pts: asymptomatic diaphragmatic stimulation. ASP was used in 2 pts with CAVB and congestive heart failure. Both ASP failed to sense atrial depolarization and functioned as fixed-rate ventricular P.

LP and RP offer a durable power source acceptable for pediatric pts needing atrial or ventricular permanent pacing. ASP has not yet proven to work efficiently.

154 COMPARISON OF RHEUMATIC MITRAL VALVE INSUFFICIENCY WITH THE "CLICK-MURMUR" SYNDROME BY ECHOCARDIOGRAPHY. William W. Pinsky, Howard P. Gutgesell and Dan G. McNamara, Baylor College of Medicine, Texas Children's Hospital, Houston, Texas.

To study the usefulness of echocardiography in determining the etiology of mitral insufficiency, echocardiograms from 17 children with documented rheumatic mitral valve insufficiency (RMVI) and 27 children with the mitral "click-murmur" syndrome (CMS) were compared with studies from 130 normal children.

Mitral valve excursion was increased in 11 of 17 patients with RMVI and 16 of 27 patients with CMS. The rate of early diastolic closure (E-F slope) was increased in both groups. Aortic root diameter was normal in all patients with RMVI but was increased in 9 of 27 patients with CMS. Mitral valve prolapse was present, as expected, in the patients with CMS. However, prolapse also was present in 6 of 17 patients with RMVI.

Thus, the echocardiographic pattern of mitral valve motion was similar in children with RMVI and those with CMS. In the absence of aortic root dilatation there were no echocardiographic features which clearly separated the two groups of patients. In particular, the demonstration of mitral prolapse did not exclude rheumatic fever as the cause of mitral insufficiency.

155 USE OF UMBILICAL VESSELS FOR CARDIAC CATHETERIZATION. Co-burn J. Porter, Paul C. Gillette, Charles E. Mullins, Dan G. McNamara, Baylor College of Medicine, Texas Children's Hospital, Department of Pediatrics (Cardiology) Houston

The umbilical vein (UV) and artery (UA) provide an easily accessible route for cardiac catheterization (CC) in neonates, but catheter manipulation reportedly is more difficult and long term sequelae more likely than with cutdown(C)or percutaneous(P) entry of the femoral veins. This study was undertaken to evaluate these objections to UVCC and UACC.

From January 1971 through July 1976, 193 infants ≤1 week old underwent CC. Of these infants 85 (44%) had UVCC, 77 (40%) CCC, and 31 (16%) PCC. The UA was also catheterized in 74/85 with UVCC, 39/77 CCC, 14/31 PCC. Success of catheter manipulation is shown by the ratio of chamber entered/chamber accessible to catheter:

	RV	LA	LV	PA PROGRADE	PA RETRO-GRADE BY UA	MEAN TIME
UVCC	81/84	82/86	64/69	30/75	14/75	115 min
CCC	74/77	75/77	63/72	28/55	3/55	143 min
PCC	31/31	31/31	28/31	16/24	2/24	146 min

During CC, complications related to method of catheter entry occurred in 3/85 with UVCC, 1/127 UACC, 2/77 CCC, 0/31 PCC. In those surviving 24 hrs after CC and in whom we have adequate follow-up, complications recognized >24 hrs after CC were found in 4/67 with UVCC, 0/110 UACC, 10/73 CCC, and 1/30 PCC.

UVCC and UACC was performed more quickly and as successfully as CCC or PCC in the neonates evaluated and with no more immediate or long term complications.

156 QUANTITATION OF RIGHT VENTRICULAR (RV) HYPERTROPHY WITH THALLIUM-201 IN CHRONICALLY HYPOXIC RATS. Marlene Rabinovitch, Keith Fischer, Walter J. Gamble, Lynne Reid, and Salvador Treves, Spon. by Alexander S. Nadas. Harvard Medical School, Children's Hospital Med. Ctr. Dept. of Cardiology, Radiology, and Pathology. Boston, Mass.

Twenty rats (Charles River CD) mean weight 223gm, were divided into two groups: 10 control rats (CntR) kept in room air, and 10 hypoxic rats (HypR) kept in a hypobaric chamber (air at 380 mmHg absolute). At two weeks all the animals were weighed and injected intravenously with 50uCi thallium-201. After 10 min. the animals were exsanguinated. The RV and left ventricles (LV) were separated and weighed. Thallium-201 radioactivity of RV and LV was measured in a gamma well counter. The arterial tree of the lungs was injected with micropaque gelatin and the alveolar tree inflated and fixed for histology. The HypR did not grow well and were polycythemic. The HypR showed significant RV hypertrophy; LV/RV mass ratio (MR) = 2.4 mean; CntR-MR = 3.8 mean ($p<.0005$). LV/RV thallium-activity ratio (TAR) correlated well with the MR in both HypR and CntR ($r = .962$ where $MR = .863\ TAR + .27$). HypR vs CntR showed histologic changes of hypoxic pulmonary hypertension: i.e. increased muscularity of small intracinar pulmonary arteries ($p<.013$), abnormal extension of muscle into small arteries ($p<.004$) and decreased number of peripheral arteries ($p<.0005$). We conclude that myocardial thallium-201 uptake reflects and quantitates LV/RV mass ratio which, in our model, included normal and abnormal (RV hypertrophy associated with hypoxic pulmonary hypertension). This may have clinical application in the external detection of right ventricular hypertrophy with the gamma camera.