† **199** OXYGEN CONSUMPTION (VO_2) AND TISSUE METABOLISM IN THE HYPOXIC LAMB. Michele Moss, Gordon Moreau, and George Lister. Dept. of Pediatrics, Yale University School of Medicine, New Haven, CT

The observation has been made in the newborn (NB) animal that a fall in VO_2 with alveolar hypoxia is not always accompanied by acidosis, suggesting that there is primarily a reduction in non-essential oxidative metabolism. To test this hypothesis we compared the metabolic consequences of an induced reduction in VO_2 in conscious NB and older lambs. Seven lambs with chronic aortic and pulmonary arterial catheters were studied at < 7 days, at 1 mo. and at 2-3 mos. Sequential measurements were made at FIO_2 = .21, .16, .12 and .08 obtaining: arterial and mixed venous blood gases, hemoglobin (Hb) concentrations, $\%HbO_2$, lactate (L), VO_2, and CO_2 production (VCO_2). Base deficit (BD), cardiac output, systemic O_2 transport (SOT) and R (VCO_2/VO_2) were calculated. All data were compared to measurements at FIO_2 .21. In all groups when SOT fell sufficiently with hypoxia there was a fall in VO_2. This occurred at a higher SOT in the NB (15 mlO_2/min/kg) than lambs 2-3 mos (10 mlO_2/min/kg). Δ L (L-L@control) consistently increased at all ages to ≥ 3 mMol/L whenever VO_2 decreased to ≤ .7 x control VO_2. Like L, BD and R increased significantly with a fall in VO_2. Therefore we found that a comparable decrease in VO_2 is attended by evidence of anaerobic metabolism at all ages; the major age related difference was the higher critical SOT at which this occurred in the newborn. Thus, the newborn does not seem to be less susceptible than the older subject to the impairment of oxidative metabolism caused by alveolar hypoxia.

† **200** PENTOBARBITAL THERAPY (P) DOES NOT IMPROVE NEUROLOGICAL OUTCOME IN NEAR-DROWNED, FLACCID CHILDREN (C_3). Eliezer Nussbaum, Wendy Dorchester (Spon. by Houchang Modanlou). Pediatric Critical Care, Miller Children's Hospital of Long Beach and The Department of Pediatrics, University of California, Irvine.

The relative effect of P was evaluated in 51 C_3 children who were divided into: A-16 treated with hypothermia (H=86±2°F) and P, achieving serum levels >25 mcg/cc. B-25 treated with H but P completely excluded and, C-10 receiving H but had P serum levels <25 mcg/cc. All 51 (C_3) children received conventional therapy (i.e. $PaCO_2$ 20-25 torr, Pa_{O_2} > 100 torr, fluid restriction, pancuronium bromide, dexamethasone and Lasix or mannitol). Analysis of variance failed to detect statistically significant differences (SSD) among the 3 groups for age, submersion time, arterial pH, core temperature and mean intracranial pressure (ICP) prior to initiation of P. A had 9 intact survivals (IS), 6 brain damaged (BD) and 1 who expired (E). B had 7IS, 4BD, 14E and C had 3IS, 4BD, 3E. ICP in IS or BD was 10.6±4.7 and 13.1±6 mmHg respectively VS E (27.7±19.5 mmHg) ($P<0.001$). Chi Square analysis with Yates correction revealed higher mortality for B than A ($P<0.01$) and higher than A & C ($P<0.01$). No SSD in BD or IS among survivors for A, B and C. In conclusion: 1) P does not improve neurological outcome in C_3. 2) ICP was lower for survivals (IS&BD) but could not predict neurological outcome. 3) The higher survival rate with P was associated with BD rather than IS. 4) P may not be justified in C_3. 5) Previous claims implying better neurological outcome with combined H&P should probably be attributed to the effect of H alone.

201 DIAGNOSIS RELATED GROUPS: A COMPARISON OF PEDIATRIC INTENSIVE CARE AND NONINTENSIVE CARE PATIENTS. L. Reuven Pasternak, J. Michael Dean, Frank R. Gioia, and Mark C. Rogers, The Johns Hopkins Medical Institutions, Departments of Anesthesiology/Critical Care Medicine and Pediatrics, Baltimore, Maryland 21205.

The case mix for 2,403 pediatric intensive care (PICU) and 14,552 general ward patients (WARD) by Diagnostic Related Groups (DRGs) were examined for a three year period. Available data included length of stay (LOS) and mean charges (MC) within eight accounting categories for each DRG for PICU and WARd. A subset of 856 PICU and 2,222 WARD patients in 9 most common DRGs was examined for variations in LOS and MC per patient. While case mix by DRG was consistent over time for both groups, the PICU case mix differed significantly from that of the WARD ($p<.001$). After adjustment for inflation and for differences in case mix, the average LOS for the PICU was 10.7 days versus 6.1 for the WARD ($p<.025$) with a MC of $7,172 for PICU and $2,946 for WARD ($p<.01$). These differences increased over time. During the three year period, PICU average LOS increased by 4.9% (.5 days) while that of the WARD decreased by 29.4% (2 days). In addition, marked differences in LOS and MC between PICU and WARD were found within the 9 DRGs. We conclude that significant inhomogeneity exists between PICU and WARD in all indices of resource utilization. Combining the PICU and WARD populations for the purpose of setting target rates and projecting length of stay would strongly bias reimbursement protocols against the PICU population.

† **202** COMPARISON OF MYOCARDIAL DYSFUNCTION IN THREE FORMS OF EXPERIMENTAL SEPTIC SHOCK. Keith J. Peevy, Tim Reed, Stephen A. Chartrand, Richard D. Olson, and Robert C. Boerth, University of South Alabama, College of Medicine, Depts. of Peds. and Pharm., Mobile, Alabama.

Previously we have demonstrated myocardial dysfunction in experimental group B streptococcal shock. To determine if myocardial dysfunction occurs in other forms of experimental septic shock, rabbits were instrumented to measure mean arterial pressure (MAP), heart rate (HR), left ventricular dP/dt (LVdP/dt) and end diastolic pressure (LVEDP), cardiac output (CO), pulmonary artery pressure (PAP), and arterial blood gases. Hemodynamic variables and blood gases were assessed before and 30 minutes after infusion of heat-killed S. epidermis (SE), H. influenza (HI) and E.coli (EC), 10^{12} organisms/kg. The Table shows mean values ± SEM for MAP and LVdP/dt for each group of animals at BASE and 30 minutes. * = different from BASE ($p<.05$).

	EC(N=4)		HI(N=4)		SE(N=6)		CONTROL(N=4)	
	BASE	30 min	BASE	30 min	BASE	30 min	BASE	30 min
MAP(mmHg)	90±6	*52±5	91±10	*57±11	83±4	*45±4	90±5	90±4
LVdP/dt	7373	*2439	5506	*2931	5359	*2234	5862	5952
(mmHg/sec)	±1700	±932	±1082	±946	±334	±429	±605	±428

MAP, LVdP/dt, CO, and HR all fell significantly in each experimental group and PAP rose significantly with EC and SE and was increased with HI. LVEDP was not altered significantly in any group. We conclude that septic myocardial dysfunction is not unique to a specific organism, but is a common component of both gram negative and gram positive septic shock. These data support the concept that endogenous substances modulate septic shock.

203 SEVERITY OF ILLNESS IN CHILDREN: MULTI-INSTITUTIONAL VALIDATION OF THE PHYSIOLOGIC STABILITY INDEX (PSI). Murray M Pollack, Urs E Ruttimann, and the Multi-institutional Study Group (Alan I Fields, Bradley P Fuhrman, Nancy L Glass, Peter R Holbrook, Robert K Kanter, Robert W Katz, Curt M Steinhart, William A Spohn, Timothy S Yeh, Aaron R Zucker). (Spon by Glenn Rosenquist). GWU Med Sch, Child Hosp Nat Med Cntr, Depts of Pediatrics and Anesthesia, Washington, DC.

Direct assessment of severity of illness would benefit many aspects of pediatric intensive care (e.g. cost containment, quality of care, therapeutic efficacies, institutional comparisons). The PSI, a direct assessment of severity of illness has been prospectively validated in 1 PICU. The PSI assesses risk of mortality by sampling 34 variables from 7 physiologic systems. However, assumptions in the PSI's development, especially the possibility of under or over measurements, require a multi-institutional validation. Participating centers collected daily PSI scores on ≥ 200 consecutive PICU patients or for ≥ 6 months. The observed mortality for ordered admission PSI scores was compared to the predicted mortality. The model to predict mortality was developed by logistic regression analysis predicting mortality from the organ system PSI scores and age as predictor variables (822 patients). Results: 4 centers have completed data collection. The average mortality rates ranged from 3.0% to 12.5% ($p<.01$). However, when adjusted for severity of illness by admission PSI scores, the observed mortality rates for the admission PSI intervals were statistically reliably predicted by the model (X^2 (3) for each center = 0.84, 2.54, 4.15, 6.36). Conclusions: 1) The PSI is a statistically reliable predictor of mortality in all tested centers. 2) A single system is applicable to all tested centers.

204 CARDIOPULMONARY (CP) VARIABLES IN SURVIVORS(S) AND NONSURVIVORS(NS) OF SEPTIC SHOCK. Murray M Pollack, Alan I Fields, Urs E Ruttimann (Spon by Glenn Rosenquist) GWU Med Sch, Child Hosp Nat Med Cntr, Depts of Pediatrics and Anesthesia, Washington, D.C.

The distributions of CP variables obtained during the period of therapy for hypotension during septic shock may better delineate the important CP variables and their optimal ranges. All patients meeting the following criteria were included: 1) positive culture; 2) hypotension; 3) ≥ 3 clinical criteria for shock; 4) advanced CP variables obtained from thermodilution pulmonary artery catheters during therapy for hypotension. When multiple data sets/pt were obtained, they were averaged to obtain 1 data set/pt. The distributions of S/NS were analyzed by chi-square like statistics (Woolf's G test and Cochran's chi-square linear regression) and focused on 2 emperic variable cutoff values, the normal range and the median value of S. Results: There were 18S and 24NS. S and NS were similar for age (1.8 yr vs 1.1), underlying disease (44% vs 50%), data sets/pt (1.9 ± .5 vs 3.0 ± .4) and distributions of Gm+, Gm-, single and multiple isolates. NS did receive more vasoactive agents (1.9 ± .2 vs 1.1 ± .2, $p<.01$). Analysis of the significance of the normal range revealed that outcome was improved ($p<.05$) for CI and PCWP in the normal range. The following variables and ranges showed improved ($p<.05$) outcome outside the normal range: O_2 Extr (> .28), VO_2 (> 200), $C(a\text{-}v)O_2$ (> 5.5), pH (> 7.44) and core temp (< 37). Median survivor values indicated that Qsp/Qt (< 12%) was also a significant ($p<.05$) variable. Conclusion: The normal range of CP variables are not necessarily optimal. Clinical use of the optimal ranges isolated by this analysis may improve outcome from septic shock.