†200 EFFICIENCY OF PEDIATRIC INTENSIVE CARE: A COMPARATIVE ANALYSIS OF 8 PEDIATRIC ICUS. Murray M Pollack, Pamela R Getson, Urs E Ruttimann, Curt M Steinhart, Robert K Kanter, Robert W Katz, Aaron R Zucker, Nancy L Glass, William A Spohn, Bradley P Fuhrman, James D Wilkinson (Spon by Glenn C. Rosenquist). GW Univ and Child Hosp Nat Med Cntr, Wash., DC and NIH, Med Coll of GA, SUNY-Syracuse, Univ's of NM, Chicago, Texas, Minn, Depts of Peds and Anesth.

A national standard of ICU efficiency does not exist. This study objectively measures efficiency rates in 8 PICUs to determine if PICUs greatly differ in their efficiencies. Data included demographics, daily mortality risk (Dynamic Risk Index) and therapeutic interventions. Inefficient use of PICU resources was defined using daily mortality risks and a previously developed list of unique PICU resources; (a) low risk, monitored (LRM) pts had daily mortality risks of < 1% and did not use any unique PICU therapies and (b) potential early discharge (PED) pts did use unique resources or have mortality risks >1% during the early ICU stay but their last, consecutive PICU day were equivalent to LRM pts. Total, LRM and PED days of care were used to calculate efficiency rates. RESULTS. Data was collected on 1668 pts and 6962 days of care. LRM pts comprised from 16% to 58% of the PICU pts ($p < .0001$) and utilized between 5.4% and 34.5% of the days of care ($p < .0001$). PED pts comprised from 12% to 29% of the PICU pts ($p < .0001$) and their PED days comprised from 5.1% to 17.2%. Overall, the efficiency ratings ranged from .89 to .55. CONCLUSIONS. (1) Large differences in efficiency of PICU utilization exist. (2) The finding of significant over-utilization by PED patients is unique. (3) Efficiency rates over .80 are reasonable. Supported by MCH grant MCJ-11-527.

●201 THE PEDIATRIC RISK OF MORTALITY (PRISM) SCORE: A SIMPLIFICATION OF THE PHYSIOLOGIC STABILITY INDEX (PSI). Murray M Pollack, Urs E Ruttimann, Pamela R Getson (Spon by Glenn C Rosenquist). GW Univ, Child Hosp Nat Med Cntr, Departs of Anesth and Peds, Wash., D.C.

The PSI, an assessment of severity of illness with 34 physiologic variables and 75 variable ranges, is becoming important in clinical research, cost containment, and quality assurance. This analysis simplifies the PSI to enable broader use. METHODS. 2642 patients from 9 PICUs were used. The sample was split into estimation (n = 1415, 116 deaths) and validation (n = 1227, 105 deaths) groups. A series of statistical techniques developed the PRISM score. The PRISM score performance was tested using goodness-of-fit tests and ROC analysis. RESULTS. Using the estimation group, the number of admission day, variables was reduced to 14 (all non-invasive) with 23 ranges. Performance evaluation in the validation set indicated the observed deaths were accurately predicted in all 6 PICUs in the validation group. ($X^2(5)$: 0.88, 1.05, 2.91, 4.95, 5.61, 9.44) as well as the total validation sample ($X^2(5) = 1.33$). Overall, 105 deaths were observed and 108.9 were predicted. The PRISM score also performed extremely well in the all pt classification groups including: operative pts (N = 403, $X^2(5) = 5.26$); nonoperative pts (N = 824, $X^2(5) = 3.32$); cardiovascular pts (N = 229, $X^2(5) = 2.47$); respiratory pts (N = 359, $X^2(5) = 7.71$). The performance of the PRISM score as assessed by ROC analysis was excellent (area index = .92). CONCLUSION. The PRISM score is a greatly simplified version of the PSI score with equivalent performance. It is institutionally independent and not influenced by diagnosis. Supported by MCH Grant MCJ-11-527.

202 FLUID ACCUMULATION AFTER CARDIOPULMONARY BYPASS WITH DEEP HYPOTHERMIA AND TOTAL CIRCULATORY ARREST. Ronald L. Rabin, Edward D. Verrier, Scott J. Soifer (Sponsored by Michael A. Heymann). University of California, Dept. of Pediatrics, Surgery, and CVRI, San Francisco, California.

Cardiopulmonary bypass (CPB) with deep hypothermia and total circulatory arrest (DHTCA) is commonly used for total correction of congenital heart malformations in infants. One of the most striking sequelae of DHTCA is the large extravascular fluid accumulation. It is commonly believed that the youngest infants accumulate the most extravascular fluid, and that this accumulation may affect mortality. We asked whether age is indeed a predictive factor for extravascular fluid accumulation, and whether there were other predictive factors. We retrospectively studied 50 patients, age 1-334 days, 90.6 ± 82.0 (mean ± S.D.), who underwent DHTCA from July 1, 1984 to December 30, 1985. Variables examined were age at operation, preoperative, and immediate postoperative hematocrits, CPB time, DHTCA time, lowest nasopharyngeal and rectal temperatures, arterial blood gas base deficit immediately after bypass, the highest postoperative creatinine, and mortality. These variables were compared to maximum % weight gain (as an index of extravascular fluid accumulation). The maximum % weight gain was 1-38% (16.7 ± 9.0). None of the factors examined correlated with maximum % weight gain, and thus extravascular fluid accumulation. The mortality rate was 10%. We conclude that there are no predictive factors for extravascular fluid accumulation, and that it does not affect mortality.

▲203 ELEVATED CARDIAC OUTPUT (CO) WITHOUT ELEVATED O_2 DELIVERY (QO_2) DOES NOT PROTECT AGAINST METABOLIC ACIDOSIS DURING SEPSIS IN PIGLETS. B.F. Rudinsky, E. Strates, K.J. Komar, W.L. Meadow (spon. K-S Lee), Dept. of Pediatrics, U. of Chicago, Chicago IL.

Infants infected with Group B Streptococcus (GBS) develop reduced CO, reduced QO_2, and metabolic acidosis. We investigated whether reduced CO is a necessary prerequisite for acidosis during GBS sepsis. Piglets (n=16) were anaesthetized and ventilated. Blood pressure, left atrial pressure (LAP), and CO were measured. Blood gases and O_2 contents were determined q. 30 min X 4 hours from aorta and PA. Group 1 (GBS,n=6) received GBS X 4 hours. Group 2 (GBS/DEX,n=6) received GBS + 6% Dextran sufficient to raise LAP from 5 to 12 mm Hg. Group 2 piglets were phlebotomized to maintain QO_2 equal to Group 1 during every 30-minute interval. Group 3 piglets (SAL,n=4) received 0.9% NaCl.

After 240 minutes of GBS, CO and QO_2 fell from 104.4 to 42.5 cc/min/kg and 14.2 to 5.7 cc O_2/kg/min (both $p<.01$). After 240 minutes of GBS/DEX, QO_2 fell from 16.8 to 7.3 cc O_2/kg/min ($p<0.01$, 0 vs 240 mins; p=N.S. at each 30-minute interval vs GBS), while CO did not fall significantly (119.9 to 105 cc/kg/min p=N.S. vs SAL; $p<0.01$ vs GBS). Both GBS and GBS/DEX developed lower pH (7.20; 7.22) and greater base deficit (-14.0; -9.7) than SAL (7.44, -2.7) ($p<0.05$ GBS & GBS/DEX vs SAL; p=N.S. GBS vs GBS/DEX). No differences in VO_2 or O_2 extraction were noted between GBS and GBS/DEX.

Conclusions: 1. GBS infusion reduced CO, QO_2, & pH in piglets. 2. Dextran raised LAP and CO during GBS sepsis. 3. Elevation of CO (but not QO_2) during GBS did not protect against the development of metabolic acidosis. Reduced CO is not a hemodynamic prerequisite for acidosis during GBS sepsis in piglets.

204 HYPOCALCEMIA IN ACUTELY ILL CHILDREN: STUDIES IN SERUM Ca, BLOOD IONIZED Ca AND Ca REGULATING HORMONES. GJ Sanchez, PS Venkataraman, RW Pryor, MK Parker, HD Fry, KE Blick. Univ. Okla. Pediatr.,Okla. City (Spon. OM Rennert).

In acutely ill children requiring intensive pediatric care we studied the theses, 1) serum Ca would be low, 2) serum calcitonin (CT) would be elevated, and 3) decrease in serum CT and increase in serum parathyroid hormone (PTH) would result in restoration of serum Ca. In 8 children, ages 3.4±1.1 yrs. (mean ±s.e.), whole blood ionized calcium (iCa), serum Ca, Mg, P, PTH and CT were measured within 24 hrs. of hospitalization, and on days 2 and 3. Serum Ca was 7.9±0.34 on entry (N 8.5-10.5 mg/dl) and increased to 8.3±0.21 and 8.3±0.14 mg/dl, $p<0.03$, blood iCa was 4.49±0.05 on entry (N 4.7-5.2 mg/dl) and rose to 4.85±0.08 and 4.75±0.16 mg/dl, on days 2 and 3, $p<0.015$. Serum Ca rose in 7/8 children who improved, and declined in 1 child who expired. Serum Mg and P did not change. Serum PTH was 83±27 (RIA, N 29.5-85 pmol/L) on entry and 82±23 and 82±28 pmol/L on days 2 and 3, change not significant. Basal serum CT was elevated at 335±126 pg/ml, $p\leq0.05$ (RIA, N 54± pg/ml) and remained elevated 255±53 and 238±43 pg/ml on days 2 and 3. Thus, in acutely ill children, 1)serum Ca is low and rise with clinical improvement, 2)serum CT is elevated, 3)serum PTH is normal. We speculate that hypercalcitonemia and transient unresponsiveness to serum PTH may result in hypocalcemia in sick children.

205 CHANGES IN BODY COMPOSITION IN PEDIATRIC INTENSIVE CARE UNIT (PICU) VS WARD (W) PATIENTS. Dominic Sanfilippo, Andreas Theodorou, Dora M Alvarez, Jay R. Shayevitz, D. Dean Wade, Ashok P.Sarnaik (Spon. by Alan Gruskin). Depts. of Pediatrics and Anesthesiology Wayne State Univ. Sch. of Med., Det., MI 48201.

We performed a prospective survey of PICU and W patients to compare changes in body composition over time. On admission and hospital day 3, we recorded weight (WT), midarm circumference (MAC), triceps skinfold thickness (TST), and therapeutic intervention score (TIS). Anthropometrics were normalized as a percentage of the value for day 1 to minimize size and age effects. We compared WT, MAC, TST, and TIS score on day 1 with day 3 by 2-way ANOVA. $P \leq 0.05$ was considered significant. Values are expressed as mean ± SD.

	PICU (N=18)				WARD (N=6)			
	DAY 1		DAY 3		DAY 1		DAY 3	
	%	Values	%	Values	%	Values	%	Values
WT	100	(2.7-56.6kg)	101± 8		100	(3.46-12.2)	102±5	
TST	100	8.6±5.2mm	86±17	7.4±4.7	100	6.5±2.1	102±9	6.4±2.0
MAC	100	15.9±5.0cm	98± 6	15.5±4.9	100	13.1±4.7	102±3	11.8±3.1
TIS		30.9±9.0		24.7±10		7.5±2.1		5.7±2.2

By Least Significant Difference ($P \leq 0.05$), day 3 PICU TST is less than both day 1 PICU and day 3 W TST. These results suggest that a rapid loss of fat stores occurs in PICU but not in W patients over time (P=0.04). TIS scores were higher in PICU vs W patients on both days (P=0.045). Decline in fat stores may be related to severity of illness or to deficient provision of supplemental nutrition. We can make no conclusions about differences in premorbid nutritional state between PICU and W patients.