79 EFFECT OF EARLY ADOPTION ON I.Q. AND SCHOOL PERFORMANCE OF MALNOURISHED CHILDREN. Myron Winick, My Lien Nguyen, Knarig, K. Meyer and Ruth C. Harris. Columbia Univ. College of Phys. and Surg., Institute of Human Nutrition, New York City.

There has been recent interest in the thesis that the effects of early malnutrition can be reversed in children who are subsequently raised in an "enriched" environment. To test this possibility we examined the records of a cohort of Korean children, severely malnourished (SM), moderately nourished (MN), and well nourished (WN) during the first six months of life. All were adopted by U.S. families and school records were evaluated between ages 6 and 12. Results demonstrated that in those adopted before age two the I.Q. of the SM averaged 102, that of WN, 112, with the MN in between. Measurement of school performance showed a similar pattern (stanine 5 - SM; 5 - MN; 6 - WN). In those children not adopted until they were beyond two years of age, I.Q. and achievement was reduced in all groups so that the malnourished children fell significantly below American norms (stanine 4.5). An inverse relationship between height, I.Q. or achievement and time of adoption was noted. These data demonstrate that although certain differences may persist between previously malnourished and well nourished children, time of adoption is extremely important in determining the magnitude of these changes.

80 EARLY RETRANSFER: A METHOD OF OPTIMAL UTILIZATION OF NICU BEDS. M. Zarif, J. Rest, D. Vidyasagar, Dept. of Ped., ALSM, University of Illinois, Chicago, Ill.

To facilitate increased utility of a 16 bed NICU Unit, we adopted a policy of early discharge (ED) of infants <2000 gm following recovery from acute illness. Once the infant was out of O₂ and oral feeding started, infant was retransferred to the hospital of birth. An inservice teaching program at primary hospitals preceded such policy. In a 12 month period 273 infants were referred to NICU. 72/243 died; 171 infants survived. 62/171 were infants <2000 gm at birth. 50% (32/62) of them were ED to the primary hospital; 49% were discharged late (LD) from NICU. 20/32 ED & 16/30 LD required assisted ventilation. None of the ED infants developed complications at the primary hospital. Relevant data is shown below.

	GA	B.W.	Wt. Dis.	Final Dis.	NICU Stay	LOHosp	Total Stay
(ED)	31±0.6	1425±55	1703±128	2207±20	15±2.2	21±3.5	36±5.7
(LD)	33±0.6	1401±59	2070±96	2070±96	40±6	-	40±6

G.A., Birth Wt. & Final Weight at discharge from hospitals was the same in both groups. Data shows that length of NICU stay for LD was significantly high. (P < .001). This leads to significantly high cost per patient in LD than in ED (\$10,000 vs \$5,000). Based on 100% occupancy of 16 beds and average length of stay of 16 days, only 365 infants could be admitted in a year. Actual admissions to our unit during this period was 435, a 16% increase in bed utilization. We conclude ED of infants from NICU increases 1: utilization of beds 2: decreases the cost of health care 3: increases the participation of primary physicians.

CARDIOLOGY

81 INOTROPIC & CHRONOTROPIC RESPONSES TO CEREBRAL & SYSTEMIC G-STROPHANTHIN IN LAMBS. Robert A. Achter, and Hector E. James, (Spon. by C. Charlton Mabry), University of Kentucky School of Medicine, Lexington Kentucky, and The Sutter Memorial Hospital Research Foundation, Sacramento, California.

The contribution of the central nervous system (CNS) in newborns to inotropic and chronotropic responses induced by G-Strophanthin (G-S) is unknown and was the subject of this investigation. Five reflexive lambs, 2-15 days of age, in which the cerebral circulation had been isolated were subjected to (1) cerebral, and then, (2) systemic infusions of G-S (80 ug/Kg). Cerebral perfusion pressure (arterial - intracranial pressure), flow, and EEG, systemic pressure, left ventricular contractility (LVC) during pacing, and EKG were continuously monitored while in both circulations blood gases and temperature were kept close to normal. The infusion of G-S into the cerebral circulation was not associated with significant changes in LVC, rate, or rhythm. Systemic infusion of G-S produced a significant increase in LVC (p .01) evidenced by an increase in DP/DT/P. Chronotropic disturbances developed in 4/5 animals. CNS perfusion and its viability was interrupted, LVC transiently increasing (p .001). All lambs developed arrhythmias when the G-S infusion was increased. It is concluded that CNS influences are not essential for inotropic and chronotropic responses to G-S in the lamb.

82 EFFECT OF RADIATION AND CONTRAST MEDIA ON CHROMOSOMES. Forrest H. Adams, Amos Norman, Renato S. Mello, and Doris Bass, U.C.L.A. School of Medicine, Department of Pediatrics, Los Angeles.

In recent years, the complexity of diagnostic cardiac catheterization and angiocardiology had increased greatly resulting in the performance of more angiocardiology per study and the lengthening of exposure time.

We have measured the chromosome aberrations in blood samples obtained from one child immediately before and for 3 years after 70 min. of radiation during cardiac catheterization and angiocardiology and the micronuclei in blood samples obtained immediately before and after similar studies from 5 children. An increase in chromosome damage was observed in all patients. The absorbed radiation dose estimated from the chromosome damage, on the order of 50 rads, was an order of magnitude larger than the estimate based on measurements of x-ray exposure rates.

Subsequently in vitro studies were performed in peripheral blood cells to determine the separate effects of contrast agents and/or radiation on chromosome damage and production of micronuclei. The data clearly indicate that exposure of the cells to 5% solutions of Renografin or Hypaque alone for 30 minutes increases the yield of chromosome breaks and micronuclei to levels comparable to those found in our patients after angiocardiology. The ability of contrast media to break chromosomes in the absence of radiation indicates a hazard in their use to tissues outside the x-ray beams and for times much longer than the x-ray exposure.

83 HYPERTENSION IN COARCTATION OF THE AORTA- Bruce S. Alpert, Hugh H. Bain, J. William Baife, Peter M. Olley and Langford Kidd, The Hospital for Sick Children, Department of Pediatrics, Toronto, Canada.

We have studied the renin-angiotensin system in the hypertension of coarctation of the aorta in 10 children with previously unstudied coarctation (group I), 6 with recoarctation (group II), and 2 with persistent post-resection hypertension without signs of recoarctation (group III). Parameters studied included plasma renin activity (PRA) in ng angiotensin/ml/hr on normal and low salt diet (7 days) and after 3 oral doses of Furosemide. Bromide space, plasma volume, exercise induced peak systolic blood pressure (BP), cardiac index and gradient across the coarctation were measured. Group I PRA's averaged 1.94, 2.69 and 21.37 for the three periods studied. Group II PRA's averaged 2.00, 6.06 and 21.51, Group III 2.49, 5.33 and 9.40. Normal PRA's (mean±S.D.) are 2.75±.89, 6.03±2.07 and 4.32±2.72. Bromide space on normal sodium diet when compared to the regression equation of Cheek averaged 118% (group I), 100% (group II) and 108% (group III). Plasma volumes (normal 43±5 ml/kg) in group I averaged 53.2 and 53.1 pre and post salt restriction, group II 47.9 and 46.0 and group III 46.7 and 48.2. Average peak increases in exercise systolic BP for the three groups were 45, 85 and 89 mmHg, with peak maximum BP of 185, 231 and 220. Gradients averaged 44 and 31 mmHg for groups I and II, cardiac indices 4.3 and 3.8 L/min/m². The near normal values of renin pre and post salt depletion, the initial volume expansion, and the marked rise post Furosemide of the PRA's supports the single kidney Goldblatt hypothesis for coarctation associated hypertension.

84 ECHOCARDIOGRAPHIC ASSESSMENT OF RIGHT VENTRICULAR FUNCTION IN D-TRANSPOSITION OF THE GREAT ARTERIES. Bruce S. Alpert, Kenneth R. Bloom, and Richard D. Rowe, The Hospital for Sick Children, Division of Cardiology, Toronto, Canada.

The ability of the right ventricle (RV) to maintain systemic pressures has been questioned in patients with D-transposition of the great arteries (D-TGA). We have studied 7 patients aged 3 to 12 11/12 yrs. (mean 8 5/12 yrs.). Five were post Mustard repair and 2 were pre-operative. The age at surgery varied from 2 5/12 yrs. to 7 10/12 yrs. The interval since surgery was from 1 5/12 to 8 3/12 yrs. Echocardiograms were evaluated for RV systolic time intervals (STI) from the aortic valve motion. Right heart dimensions were measured. These were compared with the RV ejection fraction (EF) calculated from the angiograms using the 2 chamber method. This varied between 51 and 22%. The ratio of the pre-ejection period (PEP) to the ejection time (ET) was compared to the EF. An excellent correlation was obtained (r=.90). Normalisation of the STI's for age and rate show prolongation of the PEP to a mean of 186% of predicted (range 139-265%). The ET's averaged 98% (range 81-124%). No significant correlations were obtained between EF and any of 1) RV end-diastolic pressure; 2) normalised RV end-diastolic dimension or 3) normalised PEP or ET. RV function may be compromised in D-TGA. Reduced values were found both in pre- and post-operative patients. The ratio of the PEP/ET as derived echocardiographically has excellent correlation with angiographic EF and appears to offer a reliable non-invasive method of identifying and following these patients.