445 SERUM BILE ACIDS IN PROTRACTED DIARRHEA OF INFANCY. John D. Lloyd-Still and Laurence Demers (Intr. by H. Nadler). Northwestern Univ. Med. Sch., Children's Memorial Hosp. Dept. of Ped., Chicago and Dept. of Path. The Penn. State Univ. Col. of Med., Hershey, Pa.

Measurement of 4 glycine conjugated fasting serum bile acids (μmol/l) by radioimmunoassay in 9 infants with protracted diarrhea showed values for cholylglycine 2.81 ± 3.13 (N=0.2-0.9), chenodeoxycholylglycine 2.55 ± 4.04 (N=0.05-0.2), deoxycholylglycine 0.15 ± 0.19 (N=0.08-0.7), sulfolithocholylglycine 0.31 ± 0.24 (N=0.07-0.3). Hyperbilirubinemia was absent in all infants. Other conventional tests of hepatic function were normal or showed minimal abnormalities. Six infants had secondary monosaccharide intolerance. The raised levels of serum bile acids were not related to i.v. alimentation which was administered to 3 of the 9 infants. The raised serum bile acid values were similar to those found in other hepatic disorders characterized by cholestasis (Gastroenterology 71:919, 1976). Older children with chronic inflammatory bowel disease showed normal values for serum bile acids. These findings suggest that hepatic dysfunction is commonly present in protracted diarrhea of infancy. It is possible that endotoxins are adversely affecting hepatocyte function. The long term effects of these observations are unknown. Measurement of serum bile acids are a sensitive indicator of disturbed hepatic function.

446 LOW PREVALENCE OF ANEMIA AMONG NAVAJO CHILDREN Betsy Lozoff, Gary M. Brittenham, Mahmoud Y. ElNajjar (spon. by M. Klaus), CWRU School of Medicine, Rainbow Babies & Childrens, Cleveland Metropolitan General Hospitals, Depts. of Pediatrics, Medicine, Anthropology, Cleveland

Both historical and recent evidence has suggested that iron deficiency may be common among southwestern American Indians. To assess the nutritional status of young Navajo Indians, nutritional histories, heights, weights, and fingerstick blood samples were collected from 576 children from 6 months to 10 years of age. Using Harvard standards, 19% of heights and 9% of weights were <3rd percentile for age; only 2% of heights and 4% of weights were >97th percentile. Microhematocrit determinations demonstrated a very low prevalence of anemia: only 2% were >2 S.D. below the mean for age. Plasma iron levels were determined on 440 samples with a new spectrophotometric method using ferrozine and requiring 50μl of plasma. Less than 6% of the children had iron values <12.5μmol/l (70μg/dl). Although almost all hematocrit values were normal, children with lower hematocrits for age tended to have lower plasma irons ($p<.001$) and to be shorter ($p<.001$) and lighter ($p<.03$). A much higher proportion of children with iron deficiency anemia has been reported in other U.S. populations of similar economic level. The high prevalence of breastfeeding (46%), the use of iron fortified infant formulas (by history 75% of formula users), participation in food supplementation programs, and a cultural tradition that includes meat in children's regular diet may be factors in the unusually low prevalence of nutritional anemia among these Navajo children.

447 EFFECT OF A CHEMICALLY DEFINED DIETARY SUPPLEMENT ON NITROGEN BALANCE AND SERUM LIPIDS IN CHILDREN WITH CYSTIC FIBROSIS. A. Harold Lubin, Judy Bonner (Spon. by Stella B. Kontras) Ohio State University, College of Medicine, Children's Hospital, Department of Pediatrics, Columbus, Ohio.

This investigation was conducted to determine the effect of a chemically defined dietary supplement on nitrogen balance and serum lipids of children with cystic fibrosis. Ten children with confirmed diagnosis of cystic fibrosis, minimal complications and failure to achieve growth potential were selected for the study which consisted of two consecutive two-week periods (control and experimental). The children were admitted to the hospital for the final six days of each period. Nutrient and food energy intake were provided at levels representing usual intakes based on a prestudy dietary assessment. A chemically defined formula providing one third of the Recommended Dietary Allowance for protein was given to the children during the experimental period. Nitrogen balances and other metabolic parameters were determined. During the experimental period mean nitrogen balance increased significantly and percentages of dietary nitrogen excreted in the feces and urine decreased significantly. Apparent efficiency of utilization of protein was significantly higher during the experimental period as were total lipid, triglycerides and phospholipid concentrations. Nutrition supplementation with a chemically defined formula was an effective method of improving nitrogen retention. These children will now be studied prospectively in order to ascertain whether improvement in protein utilization will result in significant improvements in growth velocity, resistance to infection and general health status. Grant #74-153, Eaton Lab.

448 TRANSIENT STEATORRHEA AFTER MILD DIARRHEA OF INFANCY. William C. MacLean, Jr., Gordon L. Klein, Guillermo Lopez de Romaña, Enrique Massa, George G. Graham. Johns Hopkins Univ. School of Medicine, Dept. of Pediatrics, Baltimore, Md. and Nutrition Research Institute, Lima, Peru.

Chronic and recurrent diarrhea is a recognized antecedent of malabsorption and malnutrition. The relationship of transient mild diarrhea to subsequent malabsorption is unknown. Six normal term infants, for whom 6 d balance control data were available, developed diarrhea in hospital while consuming formula diets (116±22 Kcal/kg/d). Mean age of onset was 29 d (range 13-37). Treatment: dilute diet (2), Lytren (2), IV + Lytren (2). Full diet was tolerated and all infants clinically well in 3-9 d. Six-day restudy was carried out 7-13 d later while gaining weight on 145±13 Kcal/kg/d. Results (mean±S.D.):

	Age	Fecal Wt-g	Fecal Fat g/d	Fecal Fat % Intake
Pre-diarrhea	14.9	65.9±35.3	2.8±1.6	14.0±9.0
Post-diarrhea	38.6	146.8±58.0	9.4±3.0	28.5±7.3
Paired "t"		-4.591	-5.081	-3.317
"P"		<0.001	<0.001	<0.01

Apparent N absorption and retention slightly lower and rate of wt gain slightly higher post-diarrhea, neither significantly so. Fecal fat in 9 similarly fed 33 d old infants without diarrhea: 3.3±1.1 g/d, 10.5±3.8% intake ($P<0.001$). Steatorrhea had resolved 4 wks later in the 2 infants restudied. Mild diarrhea may cause steatorrhea which persists several weeks after illness has clinically resolved. This could be the first step towards malnutrition-chronic diarrhea cycle in marginally fed infants.

449 NEONATAL CHOLESTASIS: ROLE OF SEPSIS AND INTRAVENOUS ALIMENTATION. Frank P. Manginello, Engeline Kok, Norman B. Javitt. Spon. by Peter A.M. Auld. New York Hospital-Cornell Medical Center Perinatology Center, Dept. of Pediatrics, N.Y., N.Y.

Parenteral alimentation is essential to the management of a variety of illnesses in the premature infant. Several reports of cholestasis in association with intravenous fat emulsions and/or protein solutions prompted a study of 24 neonates requiring continuous intravenous alimentation for as long as 70 days. Serum bilirubin (diazo method) and serum bile acids (gas-liquid chromatography) were estimated at regular intervals and correlated with body weight, antibiotics, phototherapy, and other medications. In 18 of the patients without sepsis, ranging in body weight from 800gm. to 3220gm., serum bile acids ranged from less than 2.0 - 26.8mcg./ml. ($\bar{m}$ = 13.7), and serum bilirubin fell progressively during intravenous alimentation. Sepsis in 5 of the patients was associated with both hyperbilirubinemia and markedly increased bile acids, ranging from 60-140mcg./ml. ($\bar{m}$ = 76), significantly different ($p < 0.002$) from the non-sepsis group. These findings confirm the importance of sepsis as a cause of neonatal cholestasis and emphasize the need to seek specific causes for the occurrence of cholestasis in infants requiring intravenous alimentation.

450 THE INFLUENCE OF HYPERALIMENTATION SOLUTIONS ON INSENSIBLE WATER LOSS (IWL) IN PREMATURE INFANTS. Keith H. Marks, Timothy P. Farrell, Zvi Friedman, M. Jeffrey Maisels. (Spon by Nicholas M. Nelson) Penn State Univ Coll Med, M S Hershey Med Ctr, Dept Ped, Hershey, PA.

An indirect technique of multiple weighing on an electronic balance inside an incubator was used to measure IWL in seven infants, 4-21 days old, receiving parenteral nutrition. Birth weight ranged from 960-1900 g ($\bar{x}$ 1307±321g) and gestational age 26-32 weeks ($\bar{x}$ 28.4±2 wks). Consecutive three hour Δ weight readings were made on each infant during infusion of four separate solutions while under the same environmental conditions and after allowing a 30-60 minute "washout" period between measurements. Intravenous fluids were infused at a rate of 7.7±1 ml/kg/hour.

Solution	IWL-Mean±SD g/kg/hr	g/m²/hr	p<.05
A. 5% Dextrose in .25% NaCl	0.5±.2	5.1±5.6	A:C,A:D
B. 10% Dextrose in .25% NaCl	0.9±.7	7.9±5.3	B:D
C. 10% Dextrose-amino acid solution	1.1±.6	9.3±4.3	C:D
D. 10% Dextrose-amino acid + intralipid	1.7±.6	14.8±5.6	

There was a highly significant correlation between caloric intake and insensible water loss. This indicates that (1) Parenteral nutrition solutions are rapidly metabolized and the increase in IWL is probably secondary to an elevated metabolic rate; (2) With increasing caloric intake, IWL may alter the fluid requirements of infants during parenteral nutrition.