638 THE RENAL HANDLING OF 3-METHYLHISTIDINE. Norman J. Siegel, Forrest J. Doud, Karen M. Gaudio, Gabor B. Huszar and John H. Seashore. Yale University School of Medicine, Departments of Pediatrics, Obstetrics and Gynecology and Surgery, New Haven, Connecticut.

The urinary excretion of the unique amino acid, 3-methylhistidine (3MH), has been proposed as a marker of endogenous protein catabolism and an index of a patient's metabolic state. Yet, the mechanisms of the renal handling of 3MH remain unclear. Consequently, we determined the simultaneous clearance of 3MH (C3MH) and inulin (C_{in}) in rats.

Net reabsorption of 3MH was a consistent finding. In ten euvolemic animals, C3MH (313.2 ± 37.5 µl/min/100g BW) was less than C_{in} (1017.1 ± 21.2) and the percent 3MH reabsorbed was 72.6 ± 3.7%. In five volume expanded animals, the percent 3MH reabsorbed was not significantly altered (80 ± 5.0%).

To confirm net reabsorption, 3MH combined with inulin was microinjected into proximal tubules of surface nephron Inulin recovery from the microinjected kidney averaged 102 ± 3% while the recovery of 3MH was only 74 ± 6% ($P < 0.01$). The percent of 3MH reabsorbed had no relationship to the quantity of 3MH injected, suggesting that there is no Tm for 3MH.

This study clearly demonstrates that: 1) the renal clearance of 3MH is less than that of inulin, 2) net tubular reabsorption occurs over a wide range of filtered loads of 3MH and 3) a Tm for reabsorption of this amino acid metabolite could not be documented. These factors must be considered in using urinary excretion of 3MH as a marker of nutritional status.

639 THE EFFECTS OF FORMULA (F) COMPOSITION AND VOLUME ON GASTRIC EMPTYING PATTERNS (GEP) IN THE PRETERM INFANT (PI). Robert Shaw and Allen Erenberg, U. of Iowa Coll. Med., Dept, Ped., Iowa City.

GEP may be influenced by the test meal volume (V) and its composition. To determine the effects of F composition and V on GEP, 4 PI, 1.3-1.7 kg, were fed consecutive alternate feedings of Similac 24 (S) or LBW (L) at 20 ml/kg using polyethylene glycol (PEG), a non-toxic, non-absorbable marker. Studies were repeated weekly for 3 wks. Four other PI, 1.1-1.8 kg, were fed S at consecutive alternate V of 10 or 30 ml/kg. All feedings were delivered by nasogastric tube over a 5-min period, 3 hrs apart, with the PI in the supine position. 1 ml of PEG was added to each ml of F. 1-ml gastric aspirates were obtained at 10-min intervals for 1 hr and replaced with equal V of F containing 4 mg PEG per ml F. Gastric residual volumes (GRV) were calculated from equations for double sampling. In PI fed 20 ml/kg, the mean GRV at 10 min was 35% for S and 46% for L, and neither changed significantly thereafter. There was no significant difference in the mean GRV between PI fed 20 ml/kg S or L during the test period. In PI fed S, 10 ml/kg, the mean GRV was 52% at 10 min and did not change significantly over the next 50 min. In PI fed 30 ml/kg, the mean GRV was 32% at 30 min and did not change significantly thereafter. Except at 20 min, the mean GRV was significantly greater at all intervals in the PI fed 10 ml/kg compared to 30 ml/kg. Conclusions: In the healthy PI, 1) there is no significant difference in GEP during the first hr after feeding in PI fed equal volumes of S or L; 2) the mean GRV varies with the volume of F fed.

640 MICROMETHOD FOR THE RAPID ANALYSIS OF PLASMA LIPIDS. Howard R. Sloan, Constance Seckel, Benny Kerzner. Ohio State University, College of Medicine, Columbus Children's Hospital, Department of Pediatrics, Columbus, Ohio.

The quantitation of plasma triglycerides (TG), cholesterol (C), cholesteryl esters (CE), and fatty acids (FFA) presently requires expensive, time-consuming multiple analyses; sample volumes are too large to permit repeated assays in the newborn. To overcome these problems, we have developed a thin-layer chromatographic (TLC) technique which simultaneously estimates these lipids. Blood is drawn into a 44.7µl heparinized capillary tube. One to ten µl of plasma is applied directly to the aquaphilic, preadsorbent area of a silica gel TLC plate. After thorough drying, the plate is developed to 10cm (20 minutes) with petroleum ether:ethyl ether: acetic acid-90:10:1 which quantitatively extracts the four lipids from the plasma and readily separates them. Color is developed with a cupric acetate stain, and the lipid content of each spot is estimated by visual comparison with standards or quantified by photodensitometry. This technique provides linear color responses over these ranges: TG, .5-10µg; C, .3-5µg; CE, .5-5µg; FFA, .5-5µg, quantities present in 10µl of normal or hyperlipemic plasma. The method's accuracy is ± 5% and its precision is ± 3%. Results are available within ninety minutes and the estimated cost is approximately one dollar per test. With TLC we have: determined the C, CE, and TG content of normal and hyperlipemic plasma; monitored on a daily, and even hourly basis, lipid levels of small premature infants receiving IV fat; and screened for hyperlipidemia. This microtechnique should facilitate the study of fat metabolism in infants.

641 THERAPY OF CHRONIC NONSPECIFIC DIARRHEA OF CHILDHOOD: A PROSPECTIVE STUDY. James R. Smalley, William J. Klish, Marilyn R. Brown, Mary Ann Campbell, (Spon. by Gilbert B. Forbes), University of Rochester School of Medicine. Strong Memorial Hospital, Department of Pediatrics, Rochester, NY.

Chronic nonspecific diarrhea of childhood (CNDC) is a common and frequently frustrating problem seen between 6 and 30 months of age. It is characterized by 2 or more loose, voluminous, foul smelling stools per day for more than 4 weeks, unassociated with pain or failure to thrive. The etiology of this disorder is unknown and little information as to proper treatment is available.

In order to assess bulk agents as therapy in this problem, 19 consecutive children with the clinical diagnosis of CNDC were studied. A 24 hour diet recall and stool examination for parasites, bacteria, occult blood, pH, and carbohydrate were obtained. All patients were negative for carbohydrate intolerance and occult blood. One child had campylobacter and 2 had giardia as the cause of their diarrhea. Sixteen remaining children were treated first with an unrestricted diet for 1 week, then psyllium containing bulk agents for 2 weeks (1 tbsp bid), and if no response, cholestyramine (2½ gms qid) for 2 weeks. 81% of the patients responded to therapy. Three (19%) responded to normalization of the diet only, 9 (56%) to psyllium, and 1 (6%) to cholestyramine. Only 3 (19%) did not respond. Of the patients who responded, most did so promptly and required only 2-3 weeks of therapy. A therapeutic approach consisting of normalization of the diet and bulk agents seems to be an effective mode of therapy in this common childhood disorder.

642 MEDICAL VS SURGICAL MANAGEMENT OF GASTROESOPHAGEAL REFLUX (GER) IN THE SEVERELY MENTALLY RETARDED. Judith M. Sondheimer, James D. Wilkinson and David L. Dudgeon. (Spon. by Frank Oski) SUNY, Upstate Medical Center, Depts. of Peds. and Ped. Surgery, Syracuse, New York.

We compared medical and surgical treatment of GER in 31 severely retarded children (mean age 15.9 yr; IQ<20) to define relative risk and effectiveness of each method and develop treatment guidelines for this special patient group. At diagnosis all 31 were treated ≥ 8 wks with antacids, small frequent feedings, elevation of head and in 2 bethanechol. In 8 "responders"(26%) symptoms cleared completely(4) or partially(4). Of 23 medical failures, 14 underwent Nissen fundoplication and gastrostomy. In 9 medical "failures" surgery was refused and medical therapy was continued. Results are below. *=effected at last visit/initially effected.

	Mean f/u months	6 mos wt gain	Emesis*	Respiratory symptoms*	Anemia*
"Responder"(8)	30	+14%	3/8	2/2	1/2
Surgical(14)	15.3	+33%	1/14	1/6	1/9
"Failure"(9)	16.9	+ 4%	8/9	3/5	4/8

Perioperative complications in 6 pts were esophageal perforation-2, gas bloat-2, herniated plication-2, intestinal obstruction-2, infection-2, gastric leak-1, esophageal stricture-1. Two surgical patients died of aspiration 40 & 60 days postop. Two medical failures also died of aspiration. Conclusions: Medical therapy of GER is less effective in retarded than normal children. Surgery carries high risk but provides good symptom control in medical failures. Mortality in medically uncontrolled patients is as great as that of surgical patients.

643 ZINC DEFICIENCY IN CHILDREN WITH CONGENITAL HEART DISEASE. Henry M. Sondheimer, Rae-Ellen Webb Kavey, Ruth Schwartz. (Spon. by Frank A. Oski). Department of Pediatrics, SUNY-Upstate Medical Center, Syracuse, and Division of Nutritional Sciences, Cornell University, Ithaca, New York.

Growth failure is a frequent problem in children with congenital heart disease. Since chronic hypozincemia can also cause growth retardation, fasting plasma zincs were obtained in 69 children undergoing cardiac catheterization to determine if zinc deficiency was related to growth delay in these patients. The mean plasma zinc for this group was 87 µg/dl (Range: 46-152) which is comparable to published normals. Ages ranged from 1 day to 21 years.

Patients with zinc levels in the low 20% (< 72 µg/dl) were then compared to the remainder of the group for weight percentile, age, use of chronic digoxin for heart failure, and presence of Downs Syndrome. Chi-squared analysis showed:

Weight < 5th percentile	$p < .01$
Age > 14 years	$p < .02$
Digoxin Therapy	NS
Downs Syndrome	NS

Only 2 patients were on chronic furosemide, a potent zincuric, but one of these had the second lowest zinc, 48 µg/dl. We conclude that hypozincemia is frequently seen in growth retarded children with congenital heart disease. However, this was not related to digoxin therapy for chronic congestive heart failure or the presence of Downs Syndrome in these children.