427 FAILURE AND HAZARDS OF SUPERIOR MESENTERIC ARTERIAL INFUSION OF VASOPRESSIN FOR CONTROL OF BLEEDING VARICES IN CHILDREN. F.Daum,P.Zucker,G.Dinari, S.Kleinhaus,M.I.Cohen,S.J.Boley,Albert Einstein Coll.Med., Montefiore Hosp.& Med.Ctr.,Dept.Ped. & Dept.Surg.,The Bronx, NY.

In adults with cirrhosis and hemorrhage from esophageal varices, infusion of vasopressin into the superior mesenteric artery (SMA) has resulted in the rapid control of bleeding, often within minutes. Three children with chronic liver disease, cirrhosis, and bleeding varices documented by fiberoptic endoscopy, received vasopressin by continuous SMA infusion. The dose of vasopressin used was 0.1 to 0.4u/min for a period of 50 to 145 hours. Despite receiving the maximal dose of vasopressin recommended for adults over a prolonged period of time, the three patients continued to have intermittent but significant bleeding requiring further blood transfusion. Transient side effects of vasopressin included mild to severe water intoxication and significant bradycardia with loss of all palpable pulses without other signs of vascular instability. Early and late complications of the transfemoral arterial catheterization in one child included paresthesias in the ipsilateral extremity within 24 hours of catheterization and severe ischemic changes 10 days later requiring three thrombectomies. The failure of continuous prolonged intraarterial vasopressin infusion to adequately control bleeding and the complications associated with this procedure suggest that the use of this therapy may not be appropriate for children with cirrhosis and varices.

428 EFFECTS OF PHOTOTHERAPY ON INTESTINAL DISACCHARIDASE ACTIVITY IN THE RAT. G.Dinari, F.Daum, M.I. Cohen, H.McNamara,Albert Einstein Coll.Med.,Montefiore Hosp. & Med.Ctr.,Dept. Pediatrics, The Bronx, New York.

Diarrhea occurs in some newborns undergoing phototherapy for hyperbilirubinemia presumably due to decreased intestinal lactase activity. Such an effect may result directly from photo-energy or photo-oxidative products on the enzyme. To study the mechanism of this diarrheal state, a congenitally jaundiced homozygote Gunn rat (jj) and a non-icteric heterozygote litter mate (Jj) were used. Both jj and Jj adult rats were shaved of hair, treated with phototherapy for 48 hours, sacrificed, and the activity of lactase and sucrase determined in intestinal mucosal scrappings. In 5 therapy treated jj rats, lactase and sucrase activities were 2.1 and 14.1 umol/g/min respectively, compared to 4.7 and 24.0 in 5 untreated jj controls ($p < .05$ lactase, and $p < .001$ sucrase). There were no significant changes in disaccharidase activities in a group of 13 similarly treated Jj rats. A stable mucosal peptidase, GGTP, was unaffected in jj and Jj phototherapy treated rats. Bile collected from a treated jj rat had no effect on disaccharidase activities when incubated with mucosa in vitro. Incubation of mucosa with serum from a treated jj rat similarly had no effect on disaccharidase activities. The in vivo decrease in disaccharidase activities in phototherapy treated jaundiced rats (jj) but not in their anicteric litter mates (Jj) suggests that the photo-oxidative products and not direct light-energy alters disaccharidase activities. The mechanism for inhibition remains unknown.

429 COMPARATIVE INHIBITORY EFFECTIVENESS OF CHOLESTRYAMINE RESIN AND ACTIVATED ATTAPULGITE ON VIBRIO CHOLERAE ENTEROTOXIN. M.M. Drucker, J. Goldhar, P.L. Ogra and E. Neter. Dept. Pediatrics, State Univ. of N.Y. at Bflo.

Cholestyramine resin, an anion exchange material binding bile acids, and activated attapulgite, composed of magnesium silicate particles adsorbing bacterial toxins, have been used in the treatment of diarrheal diseases. The relative effectiveness of cholestyramine and attapulgite in inhibiting the toxicity (fluid accumulation) of V. cholerae enterotoxin in the ligated intestinal loop of rabbits was determined. Toxin was mixed with equal amounts of a 10% suspension of either drug or physiologic saline and incubated for 1 hour at room temperature prior to injection into the loops. The animals were sacrificed 18 hours following surgery. The mean index of fluid accumulation (ml/cm per loop) with toxin alone was 1.7; with toxin-cholestyramine 1.6; with toxin-attapulgite only 0.32; and with the drugs alone 0.30. Attapulgite neutralized 8 to 10 minimally effective doses of toxin. Preliminary studies with other drugs revealed that 10% suspension of activated charcoal and 10% suspension of kaolin were effective; bismuth subsalicylate in the form of peptobismol^{R} was less efficacious than attapulgite. The clinical implications for the prevention of enterotoxin-induced diarrheal disease by available drugs are obvious.

430 DETECTION OF GASTROESOPHAGEAL REFLUX (GER) IN THE PEDIATRIC AGE PATIENT BY ESOPHAGEAL INTRALUMINAL PH PROBE MEASUREMENT (TUTTLE TEST). Arthur R. Euler, Marvin E. Ament, University of California, Center for the Health Sciences, Department of Pediatrics, Los Angeles.

The Tuttle Test, which directly measures gastric acid reflux, is the best method for detecting GER in adults. We used this test in 25 children (ages 4 wks.-16 yrs.) with GER symptoms to determine if this diagnostic tool was as useful in them and to learn if it was superior to cineesophagogram. Vomiting (20/25), retrosternal pain (9/25), weight<3%ile (8/25) and dysphagia (6/25) were the commonest symptoms. Skinner's[1] technique was used with the following modifications: 1) the volume of acid used was calculated by the formula (300ccs. 0.1N HCl/1.73 M^2:(X)cc./S.A. of patient. 2) the pH probe was placed orad to the lower esophageal sphincter (LES) at a position equal to 13% of the distance between the teeth and LES. Cineesophagrams were done in all patients. GER was seen in 3 but none of these children had positive Tuttle tests. One child with an esophageal stricture on cinestudy had a positive Tuttle test. Esophageal manometrics which evaluate LES function but do not detect GER were performed on all patients. Nineteen had normal LES pressures. Three of these had positive Tuttle Tests (reflux of acid). Five of 6 with decreased LES pressures had positive tests. The Tuttle test should be included in the diagnostic evaluation of all children with symptoms of GER because it has proven to be the most sensitive method for documenting gastric acid reflux in the pediatric age patient. 1. Skinner, D.B., Booth, D.J.:Ann. Surg. 172:627,1970

431 VITAMIN D LEVELS IN THE SERUM OF CYSTIC FIBROSIS PATIENTS. Philip M. Farrell and Paul A. di Sant' Agnese. NIH, Bethesda, Maryland

Vitamin D deficiency rickets has only rarely been seen in patients with cystic fibrosis (CF), in contrast to other diseases accompanied by fat malabsorption. The lack of rickets in CF has not been explained previously and led us to examine the vitamin D status of selected CF patients with steatorrhea and absent pancreatic enzymes. Accordingly, blood was obtained for analysis from 12 CF patients, 5-43 years of age. Total vitamin D activity was determined in serum samples by the standard bioassay technique which utilizes rachitic rats and gives a range of 25-400 units/dl serum in normal subjects. In addition, total carotenes and vitamin E were measured in lipid extracts of plasma by colorimetric methods. Vitamin E deficiency was found in each of these patients (mean alpha-tocopherol = 92 µg/dl, range = 8-175; normal value = 400 - 1000 µg/dl). All of the samples likewise also showed abnormally low carotene levels (<50 µg/dl). Results of vitamin D bioassays indicated that nine of the CF patients had greater than normal values. Only one showed a deficient level; however, this patient had advanced biliary cirrhosis and was in a terminal condition. Values in the other 11 patients ranged from 236 to 950 units/dl, and the average for the entire group was 604 units/dl.

In conclusion, our unexpected finding of high serum vitamin D levels in CF patients, despite their pancreatic achylia, explains the lack of clinical rickets in cystic fibrosis. This may be due to preserved intestinal absorption and/or adequate synthesis of vitamin D in exposed skin surfaces.

432 THE EFFECT OF PARENTERAL FAT EMULSIONS (PFE) ON TISSUE FATTY ACID COMPOSITION, THE MAJOR URINARY METABOLITES OF E PROSTAGLANDINS (PGEM) AND LUNG HISTOLOGY. Zvi Friedman, Edwin L. Lamberth, Jurgen C. Frolich, Richard L. Naeye (Spon. by Nicholas M. Nelson). Penn State Univ Coll Med, M S Hershey Med Ctr, Dept Ped and Path, Hershey, Pa. and Vanderbilt Med Ctr, Dept Med and Pharm, Nashville, Tenn.

The essential fatty acids (EFA) are incorporated into biological membranes and serve as prostaglandin (PGS) precursors. Plasma, RBC and tissues were analyzed in 2 neonates receiving total parenteral nutrition (TPN) for the first 11 weeks and in 3 controls fed breast milk (1) or formula (2). TPN included Intralipid (IL-50% of which is linoleic acid) 1-4 gms/kg/24 hrs. Analysis of phospholipids, cholesterol esters, free fatty acids and triglycerides by TLC and GLC revealed that: (1) plasma, RBC and tissues from infants receiving IL contained higher levels of linoleic acid compared with controls ($p < 0.001$); (2) the higher polyenoic acid derivatives of linoleic acid, Δ-8,11,14 eicosatrienoic and arachidonic acids were lower in infants receiving IL ($p < 0.001$); (3) the sum of the FA belonging to the linoleic acid series were similar in both groups. PGEM levels were lower in infants receiving IL ($p < 0.01$) as compared with controls. Histological examination of lung tissues from both infants receiving IL revealed numerous globules of sudanophilic material in septal capillaries and in the cytoplasm of septal macrophages. Plasma lipid content was not elevated. Both infants required assisted ventilation. Further study is needed to evaluate the effects of PFE on biomembranes, PGS biosynthesis, lung capillary RBC investment and gas exchange.