475 β-2-THIENYL-DL-ALANINE (Thi) AS AN INHIBITOR OF PHENYLALANINE HYDROHYLASE (PheH) AND PHENYLALANINE (Phe) INTESTINAL TRANSPORT, IN VITRO AND IN VIVO. Raul A. Wapnir, Gary S. Moak, Susan A. Moak and Fima Lifshitz. Dept. of Peds., North Shore Univ. Hosp., Manhasset, NY 11030 and Dept of Peds., Cornell Univ. Med. Col., New York, NY 10021.

Thi inhibits Phe tubular resorption and also causes malabsorption of Phe in animals. Structural similarities between Phe and Thi suggested Thi may be a good inhibitor of PheH and hence reproduce the biochemical lesion in PKU. The effects of Thi on rat liver (Lv) and kidney (Kd) PheH were assessed in vitro and in vivo, and on intestinal transport of Phe. The K_m for Lv PheH changed from 0.54 mM in the absence of Thi, to 6.6 mM in the presence of 24 mM Thi with no significant change in V_m. For Kd the respective K_m were 0.60 and 3.0 mM, both cases indicating competitive inhibition. K_i were similar in both tissues: 3.2 and 3.4 mM. Hill coefficients close to 1 showed PheH in Lv and Kd was not an allosteric enzyme. No inhibition of PheH in vivo was observed in Lv and Kd, 1 or 24 hr after an i.p. dose of Thi (2 mmoles/kg). When injections were repeated daily for 4 days, only a marginal inhibition of PheH (14% in Lv and 23% in Kd) was observed. In other experiments, when 24 mM Thi was perfused in vivo together with Phe through a 20 cm jejunal segment, it produced a moderate inhibition of Phe intestinal transport. Kinetic studies also indicated competitive inhibition. The elevated K_i for Thi (80 mM)makes it unlikely that oral Thi could effectively decrease Phe absorption and hence provide an alternative to low Phe diets in the management of PKU.

476 ROLE OF LOWER ESOPHAGEAL SPHINCTER INCOMPETENCE IN RECURRENT PNEUMONIA AFTER REPAIR OF ESOPHAGEAL ATRESIA. Whitington, Peter F., Shermeta, Dennis W., Seto, Dexter S.Y., Hendrix, Thomas R., (Sponsored by Odell, Gerard B.). Johns Hopkins University School of Medicine, The Johns Hopkins Hospital, Departments of Pediatrics, Medicine, and Surgery, Baltimore.

The cause of recurrent aspiration pneumonia after repair of esophageal atresia (EA) and tracheo-esophageal fistula (TEF) is obscure. In order to explain this occurence we performed esophageal manometry and examined barium esophagrams in eight patients, ages 11 weeks to 20 years, who had undergone repair of EA and TEF. Two patients with repeated aspiration pneumonia, a history of severe regurgitation, and free gastro-esophageal reflux of barium were found to have subnormal lower esophageal sphincter (LES) tone. One of these children's LES pressure was zero mm Hg while the other, who had previously had a Nissen proceedure, was 11 mm Hg with no relaxation after deglutition. Bethanechol, 0.075 mg/kg IM markedly augmented the LES pressure. Ten minutes after drug administration the LES pressure was 35 mm Hg in both patients. Sphincteric relaxation with deglutition was normal. Chronic bethanechol administration has proven effective in the long term therapy of one child. In contrast, six patients with no history of regurgitation and no gastro-esophageal reflux were found to have normal LES function (mean pressure=26.5 mm Hg; range=20-35 mm Hg). We feel that LES incompetence is one of the variably expressed parts of the syndrome EA and TEF that may have an adverse effect on long term prognosis.

477 TETANY INDUCED DURING INTRALIPID INFUSION-ELEVATED FREE FATTY ACID EFFECTS ON SERUM IONIZED Ca (iCa) IN VITRO, Jeffrey A. Whitsett, and Reginald C. Tsang University of Cincinnati, Cincinnati, Ohio.

A pre-term one-mo-old neonate developed laryngospasm and overt tetany during 10% Intralipid-heparin infusion. Serum total Ca was 5.0-6.0 mg%. This observation led to the hypothesis that Ca might be complexed by elevations of free fatty acids (FFA), lowering serum iCa and possibly serum total Ca. Ca and Mg form soaps with FFA that are generally water insoluble. Hydrolysis of Intralipid produces FFA's, predominantly C 18: linoleic, linolenic and oleic acid; marked elevations (2.0-7.0 mM) are reported during intravenous fat infusions, especially in SGA and pre-term infants. FFA effects on serum iCa were examined in vitro from umbilical $cord_{(6)}$, $infant_{(1)}$ and $adult_{(3)}$ blood samples. To aliquots of serum increasing concentrations of palmitic (C16), oleic (C18) or butyric acids (C4), from 0-10 mM were added. Sample pH was unchanged; iCa determinations (Orion SS-20) were made under 5% CO_2 and in room air. The slope of the change in iCa/mM FFA by regression analysis for oleic acid was 0.166± .018 ($\bar{x}$±SEM), palmitic acid was 0.11±.006 and no change for butyric acid. Oleic acid reduced iCa significantly greater than palmitic acid (t test $p<.02$). These findings represent a 60% drop in serum iCa when FFA are increased by 10 mM oleic acid. Precipitates are seen when FFA exceeds 5 mM. Presumably iCa is complexed by FFA's and forms insoluble Ca soaps at higher concentrations. Since many infants in intensive care nurseries are simultaneously at risk for both high FFA and low iCa the use of Intralipid may expose them to an added risk for tetany.

478 CHRONIC IDIOPATHIC INTESTINAL PSEUDO-OBSTRUCTION (CIIP) IN A 16 MONTH OLD MALE: MANOMETRIC STUDIES. Steven J. Widzer, Philip G. Holtzapple, William J. Snape Jr., Stephen J. Shochat, Mark A. Sullivan. University of Pennsylvania Medical School, Children's Hospital of Philadelphia, Department of Pediatric Gastroenterology, Philadelphia.

CIIP describes recurring bowel obstruction without organic occlusion of the lumen. The patient had repeated episodes of obstruction not corrected by repair of omphalocoele or malrotation, or lysis of adhesions. Histologically normal ganglion cells were present in the ileum, transverse colon and rectum. Idiopathic bilateral hydroureteronephrosis was present at birth. To define the motility defect, esophageal, duodenal, and colonic manometry were performed using perfused catheters. In the esophagus primary peristalsis was absent. The lower esophageal sphincter pressure was 41 mm Hg with incomplete relaxation (54%). Duodenal studies showed a basal state motility index of 190/min. In contrast to normal adult subjects, no response to water distention and a minimal response to secretin (0.5 U/kg IV) was observed. Bethanechol (0.1 mg/kg SC) increased the colonic motility index from a basal level of 126/min to 452/min. CIIP in this child is associated with a) absent primary peristalsis of esophagus, b) incomplete relaxation of the LES, c) impaired duodenal motor response to distention or secretin infusion, d) normal colonic motor response to a cholinergic agent, and e) idiopathic hydroureteronephrosis. Gastrointestinal smooth muscle response to physiologic stimuli is impaired in CIIP but response to pharmacologic agonists may be preserved and of therapeutic benefit.

479 IN VIVO INTESTINAL ABSORPTION OF VALINE IN GROWTH RETARDED INFANT RATS. M.K. Younoszai and P. Sufficool. College of Med., Univ. of Iowa Hosp., Dept. of Pediatrics, Iowa City, Iowa.

Absorption of amino acids by the small intestine seems to be more efficient during infancy than later in life. Growth retardation during infancy could adversely effect the efficiency of intestinal absorption of amino acid. We determined the rate of absorption of valine (val.) in segments of the jejunum and ileum of 2, 3 and 4 week old normal control(C) and growth retarded(GR) rats. Growth retardation was induced by raising rats with mothers fed a protein deficient diet and fed the protein deficient diet post weaning. Rate of absorption of val. was assessed during in situ perfusion of the segments with a solution containing per liter: 5 mmole L-val., tracer ^{14}C-L-val., 148 mmole NaCl and 20 mg Phenol Red. Jejunal absorption of val. (μmoles/g dry wt/hr) was greater in GR (Mean±SE at 2, 3 and 4 weeks: 955±133, 604±71, 377±45) than in C rats (591±43, 330±19, 143±27) at all 3 ages ($p<0.05$). Ileal absorption of val. was greater in GR (709±42, 395±23, 669±72) than in C rats (570±89, 406±25, 259±7) only at 4 weeks. These findings suggested that in the GR infant rats the absorption of val. was increased above normal rather than suppressed. The enhancement was mainly in the jejunum and persisted during the suckling and early post weaning period.

480 GASTROINTESTINAL ENDOSCOPY IN CHILDREN AND ADOLESCENTS. P. Zucker, F.Daum, G. Dinari, S. Kleinhaus, S.Boley, Albert Einstein Coll.Med., Montefiore Hosp. & Med.Ctr., Dept. Pediatrics & Surgery, The Bronx, New York. (Introduced by M. I. Cohen)

Flexible fiberoptic endoscopy has proven useful in studying adults with gastrointestinal complaints, but its usefulness in children and adolescents has not been demonstrated. During a two year period, 61 upper gastrointestinal endoscopic procedures and 67 colonoscopies were safely performed under sedation in patients ages 10 weeks to 19 years. A diagnosis was established in 11 of 26 gastroscopies for recurrent pain or vomiting. These diagnoses included webs, esophageal disorders, and ulcers. Radiology had previously failed to clearly establish these diagnoses. Gastroscopy was performed in 24 patients for evaluation of an acute bleeding episode and in 4 with suspected non-bleeding varices. The bleeding site was visualized in 6 of 8 children, but in only 1 of 16 adolescents. Removal of foreign bodies and follow-up studies accounted for 7 additional gastroscopies. 49 colonoscopies were performed in patients with inflammatory bowel disease and 16 studies provided information not available on barium enema examination. Colonoscopy was more sensitive in determining the activity of disease in ulcerative colitis and the extent of disease in granulomatous colitis. Colonoscopy was also performed in 18 patients because of bleeding. Polyps were removed in 7 patients and a colonic ulcer noted in 1 child. In the remaining 10, the source of bleeding was not determined despite intensive diagnostic investigation. These data demonstrate a safe and important adjunctive role for fiberoptic endoscopy in children and adolescents.