613 PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IN YOUNG CHILDREN. Keith J. Benkov, Philip G. Kazlow, Harriet Blumencranz, Jerome Waye, Neal S. LeLeiko (Spon. by Kurt Hirschhorn). The Mount Sinai School of Medicine, The Mount Sinai Hospital, Div. of Pediatric Gastroenterology, New York City.

Three children, ages 7 to 48 months, with severe neurological deficits, incapable of adequate oral intake, received percutaneous gastrostomies assisted by endoscopy. This recently developed technique has yet to receive notice in the pediatric literature. This procedure which we have used in patients at risk for surgery and general anesthesia, is well tolerated and easily mastered by a trained endoscopist. Endoscopy was first performed to be certain that there were no obstructive lesions. The stomach was then inflated with air and at the point of maximum transillumination on the anterior abdominal wall, (which had been surgically prepped) lidocaine was injected. A plastic Medicut catheter was plunged through the wall and into the stomach. A long nylon thread was passed through the sheath into the stomach and was grasped by the endoscopic forceps. The thread was then pulled out of the mouth, leaving one end still emerging from the abdominal wall. The end from the mouth was tied to a specially prepared Malecot catheter which was then pulled in retrograde fashion, into the stomach so that the end of it emerged from the abdominal wall. The gastrostomy was used the following day. The procedure averaged 11 minutes, compared to 57 minutes with the standard surgical gastrostomy. We believe this technique may be used by our pediatric colleagues who manage such patients.

614 CARBOHYDRATE (CHO) MALABSORPTION IN PREMATURE INFANTS Keith J. Benkov, Scott M. Sirlin, Edwin G. Brown, Cheryl Stawski, Richard M Fagerstrom, Neal S. LeLeiko (Spon. by Kurt Hirschhorn). The Mount Sinai School of Medicine, The Mount Sinai Hospital, Div. of Pediatric Gastroenterology, New York City.

We measured breath hydrogen in eleven premature infants after they received three different CHO solutions on three separate days. Gestational age ranged from 30-35 weeks (average 32.5 ± 1.4 weeks), with an average birth weight of 1805 ± 285 grams. All infants were receiving a 100% lactose containing formula (SMA) and were studied at the time they reached full feeds, ranging from 5-44 days. The babies were fasted for six hours and then received either a 10% solution of lactose (L), a 10% solution of glucose polymers (GP), or a combined solution of 5% glucose polymers with 5% lactose (GP-L). Despite the fasting, 92% of the tests, began with elevated baselines. There was no significant difference in the peak hydrogen production with the three solutions as a group (L 17.4 ± 13.0 ppm, GP 23.2 ± 19.8 ppm, GP-L 17.4 ± 14.6 ppm). Two infants had markedly elevated peak hydrogen production with the lactose solution, and had required the longest number of days to reach full feeds, 18 and 23, (average for all 9.6 ± 6.5 days). Weight gain for all infants was 24.9 ± 6.7 gm/day (receiving 111 ± 13.8 kcal/kg/day). Our preliminary results indicate that CHO fermentation occurs with several different CHO sources. The data does not support the routine exclusion of lactose from the healthy, growing premature infant's formula. A subgroup of infants exists, who might benefit from a reduced lactose formula. Total weight gain does not seem to be affected by this generalized degree of carbohydrate malabsorption.

● 615 EGF-MEDIATED BREAST MILK-ENHANCED INTESTINAL GROWTH IN NEONATAL RATS: Carol Lynn Berseth; (Spon. by G. Gilchrist), Mayo Clinic, Department of Pediatrics, Rochester, MN.

We recently showed that newborn rats handfed rat breast milk for 40 hours demonstrated greater intestinal growth than animals handfed an isocaloric formula. (Clin Res 31: A132, 1983) It was postulated that Epidermal Growth Factor (EGF) present in rat breast milk may be partly responsible for mediating this trophic response. 87 neonatal rats who never suckled were fed artificial formula containing 0, 1.2, 3.0, or 6.0 mcg/ml EGF for 40 hours. All 4 groups of rats gained weight by 40 hours, but there were no differences in whole body weight among the groups. Animals fed 3.0 and 6.0 mcg/ml of EGF-supplemented formula had significantly heavier whole intestines ($p<.05$ and $p<.01$, respectively); however, there were no significant differences in stomach or liver weight. Rats fed formula containing 3.0 and 6.0 mcg/ml EGF demonstrated significantly greater incorporation of ^3H Thymidine into DNA in the proximal ($p<.01$) and distal bowel ($p<.01$) compared to animals fed 0 EGF. Additionally, animals fed 3.0 and 6.0 mcg/ml EGF had greater intestinal DNA content ($p<.05$).

Ten newborn rats were fed breast milk containing rabbit-derived EGF antibody for 40 hours. The intestines of these pups were lighter ($p<.001$) and contained less DNA ($p<.05$) than the intestines of 10 newborn rats fed breast milk without antibody. These data indicate that EGF may in part mediate breast milk-enhanced intestinal growth in the newborn rat.

616 Effect of Vitamin E and Polysorbate on Bile Acid Transport in Newborn Rabbit Hepatocytes. R. Bhat, J-X Jiang, J.M. Walsh, M.L. Mortensen, D. Vidyasagar and M.A. Evans. Departments of Pediatrics and Pharamacology, University of Illinois Health Sciences Center, Chicago, Kunming Medical College, China and Centers for Disease Control, Atlanta.

Cholestasis as defined by a high direct bilirubin has been identified as an initial common symptom in newborn infants receiving a natural vitamin E product with high polysorbate concentrations. These studies were performed to examine the effects of Polysorbate 20 and Polysorbate 80 in combination with vitamin E on cellular toxicity, bile acid uptake and secretion in freshly isolated hepatocytes from newborn rabbits. Cellular bile acid uptake and secretion were quantitated using radiolabelled deoxycholic acid and glycocholic acid respectively. Both control and treated hepatocytes were incubated for one hour in the presence of polysorbate prior to kinetic analysis of bile acid transport. A summary of transport data is presented in the table.

		POLYSORBATE 20 (mg%)			POLYSORBATE 80 (mg%)		
	control	0.33	0.033	0.0033	0.33	0.033	0.0033
UPTAKE	++++	+++++	++++	++++	0	+++	++++
SECRETION	++++	0	0	++	0	0	0/+

Transmission electron microscopy following 1 hr incubation with 0.33% Polysorbate 80 revealed cellular blebs containing intracellular milieu, loss of microvilli and loss of ribosomes from the endoplasmic reticulum. It is concluded that polysorbates selectively inhibit hepatic bile acid secretion at concentrations below that producing either cellular damage or inhibition of bile acid uptake. The observed effects were dependant on both age and the individual polysorbate.

617 AMELIORATION OF HEPATIC CANALICULAR FUNCTION IN NEONATES RECEIVING PARENTERAL NUTRITION (PN) SOLUTIONS PROTECTED FROM LIGHT. Jatinder Bhatia, Audelio Rivera, Jr., David K. Rassin and William F. Balistreri, Departments of Pediatrics, University of Texas Medical Branch, Galveston, Texas and University of Cincinnati, Cincinnati, Ohio.

Photooxidized amino acids may have a role in the pathogenesis of PN-induced hepatic dysfunction. Protection of PN solutions from light might decrease cholestatic response to PN in neonates. Eighteen premature infants (BW=1104±229g; GA=30±2 wks) were randomly administered PN under usual nursery conditions (+light) or PN protected from light (-light). PN solutions contained dextrose, amino acids, electrolytes, minerals and vitamins. Blood was drawn before and 8 days after PN was initiated and analyzed for γ-glutamyl transferase (U/ml), cholylglycine (mM) and 5'Nucleotidase (u/hr). Intake of amino acids, dextrose, energy as well as BW & GA were similar in the two groups. Results (Mean±SD)

		γ-glutamyl transf.		Cholylglycine		5'Nucleotidase	
Group	N	Day 1	Day 8	Day 1	Day 8	Day 1	Day 8
+Light	9	48.8±31.7	36.8±22.3	2.4±2.8	6.1±3.9	0.22±0.1	0.27±0.1
-Light	9	38.8±23.4	22.0±11.0	5.9±2.8	2.8±1.9	0.26±0.2	0.23±0.1

γ-GT was significantly higher on day 8 in infants receiving PN + light than those receiving PN - light. Cholylglycine concentrations were not different; however 4 of 5 infants in the light exposed group had increased CG concentrations compared to 4 of 5 in the - light group who had a decrease. 5'Nucleotidase activity was not altered by light treatment. Our results suggest light exposure of PN solutions may alter hepatic canalicular function in neonates.

618 ESOPHAGEAL HISTOLOGY IN PEDIATRIC PATIENTS: MEASURES OF ESOPHAGITIS AND CORRELATION WITH GASTROESOPHAGEAL REFLUX (GER). D.D. Black, R.C. Haggitt, S.R. Orenstein, P.F. Whitington, Univ of Tennessee CHS, LeBonheur Children's Med Cntr, and Baptist Mem Hosp, Memphis.

Suction biopsies (BXs) containing full thickness epithelium (EPI) and muscularis mucosae (MUS) were obtained from 56 patients (mean age 15.2 mos; 34 male, 22 female) referred for evaluation of symptoms of GER and/or esophagitis and were stained with H&E and Luna (for eosinophils). Autopsy material from motor accident victims (n=5, mean age 10.6 mos) was used as control tissue. Morphometric studies included % basal cell thickness (BCT,nl<20), % papillary height (PAP,nl<60), EPI eosinophils/mm MUS (EOS,nl-absent), and neutrophils/mm MUS (PMN,nl-absent). Esophagitis was diagnosed when any value was abnormal. Continuous 24 hr esophageal pH monitoring was done in 39 patients.

RESULTS:	BCT	PAP	EOS	PMN	pH study
BCT	---	0.36a (0.008)b	0.62 (0.000)	0.14 (NS)	NS
PAP	0.36 (0.008)	---	0.34 (0.013)	0.13 (NS)	NS
EOS	0.62 (0.000)	0.34 (0.013)	---	0.25 (0.03)	NS
PMN	0.14 (NS)	0.13 (NS)	0.25 (0.03)	---	p<0.02

Analysis by linear correlation - a = corr coef, b = p value

Esophagitis was found in 45 BXs. Of 32 patients who had abnormal GER, 27 had esophagitis and 5 did not; of 7 without GER, 5 had esophagitis and 2 did not. EOS were seen in only 10 BXs, and 9 of those had other criteria for esophagitis. PMN were seen in only 4 BXs; 3 had other criteria for esophagitis.

CONCLUSIONS: Our data indicate accepted adult values for esophagitis apply to children. Most symptomatic patients have both GER and esophagitis, but GER does not always predict esophagitis. Histologically, EOS and PMN, which can be found in pinch BXs, are insensitive but specific indicators of esophagitis. Suction BX improves sensitivity because all histologic elements are present.