600 ENTEROCOLITIS FOLLOWING SURGERY FOR TOTAL COLONIC AGANGLIONOSIS (T.C.A.)-A SYNDROME DUE TO BACTERIAL OVERGROWTH. Alex F. Flores, Aubrey J. Katz, (Spon. by Harvey Colten),Dept. of Ped., Harvard Medical School, Childrens Hosp. Med. Ctr.Boston.

Enterocolitis is evolving as a common entity in patients after surgery for T.C.A., irrespective of the surgical procedure. The syndrome is characterized by diarrhea, cachexia,and abdominal distention. We evaluated 3 childrens with this syndrome, aged 13 months, 14 months, and 6 years. Patients had evidence of marked small and large bowel dilatation on xray, confirmed on barium studies. Stool cultures were negative for all currently known enteropathogens and rotovirus. All patients had malabsorption as indicated by iron deficiency anemia, an abnormal stage 2 Schillings test, and abnormal lactose hydrogen breath test. Colitis and enteritis were documented on biopsy. Duodenal fluid cultures were negative for bacterial pathogens. Treatment: All patients were placed on hyperalimentation and total bowel rest. T.P.N. alone did not alleviate their symptoms. Metronidazole and Sulfasalizine therapy however induced remission in all 3 patients. Conclusions: Enterocolitis is common following surgery for T.C.A. 2. Malabsorption occurred in all 3 patients. 3. T.P.N., Sulfasalizine, and Metronidazole therapy resulted in remission in all 3 patients, supporting the role of bacterial overgrowth in the pathogenesis of this syndrome.

601 SERUM TRACE ELEMENTS AND CERULOPLASMIN (CP) CONCENTRATIONS ON MATERNAL AND CORD BLOOD AT DELIVERY. Robert D. Foster, Shang Y. Chen, Esther M. Ponce, Mehmet Y. Dincsoy, Platon J. Collipp, Health Sciences Center, SUNY at Stony Brook, Nassau County Medical Center, East Meadow, NY. Since an accelerated rate of placental transfer have been suggested for some trace elements as the gestation advances, determination of paired samples of maternal (M), umbilical cord arterial (A) and cord venous (V), serum zinc (Zn), iron (Fe), copper (Cu) and CP concentrations were carried out. The study group consisted of 10 healthy mothers and their full term newborn infants with gestational age of 38.6±1.4 wks and birth weight of 3219±133 gm. Comparison of serum concentrations of trace elements and CP on maternal-V, cord-V and cord-A follows:

	n	Zn(ug/dl)	Fe(ug/dl)	Cu(ug/dl)	CP(mg/dl)
Cord-Venous	9	133±28	323±168	83±21	10.1±1.9
Cord-Arterial	7	159±51*	268±85 *	81±26*	9.5±2.7*
Maternal	10	75±21	95±50	248±39	59.0±8.9
V/M ratio	9	1.82±0.39	3.54±1.84	0.33±0.07	0.16±0.03

Standard t: *$p < 0.001$; paired t: †$0.05 < p < 0.10$

Marked gradient favoring fetus in concentrations of Zn (1.8 fold) and Fe (3.5 fold), yet protecting it from high Cu transfer via placenta (1/3 rd of the mother's) are indicative of a well controlled active transport mechanism. Zn and Fe gradients observed here suggest that the fetus may deplete these two elements in the mother. The function of elevated maternal CP and Cu concentrations in serum and their relationship to Zn and Cu metabolism remain unknown.

● 602 EFFECT OF PARENTERAL NUTRITION(TPN) ON POSTNATAL DEVELOPMENT OF THE SMALL INTESTINE. D. Grant Gall, Ilan Zahavi, May Chung. Univ of Calgary, Calgary. CANADA

Although TPN is used frequently in young infants, little information is available regarding its effect on postnatal development of the gut. The effect of TPN on ontogeny of the small intestine was examined in infant rabbits who received 2.5% amino acid (3.6 g/kg/24h), 10% glucose(14.4g) and 10% fat emulsion (4g) for 7 days starting at age 10-12 days. We measured mucosal weight, DNA and disaccharidase activities in segments of proximal, mid and distal small intestine and Na^+ transport in short-circuited jejunum in TPN (9) and control (5) animals at age 17-19 days. Weight gain in TPN animals (63±11g, X±SD) was equivalent to controls (53 ±8g). TPN induced development of sucrase and maltase activity despite causing a significant decrease in mucosal weight and DNA content(µg/g mucosa). Results for the proximal segment are presented(Table); similar findings were seen in the mid and distal segments.

	Sucrase(U)	Maltase(U)	Mucosal Wt(mg/cm)	DNA(µg)
C	1.5±3.6	14.5±2.0	69±11	5.9±1.1
TPN	14.6±3.2	63.7±2.0	51±14	3.6±1.8
p	<0.005	<0.001	<0.05	<0.025

Under basal conditions unidirectional (Jms, Jsm)and net(Jnet) Na^+ fluxes were not different. The addition of 30 mM glucose, which had no effect in controls, significantly($p<0.05$) increased Jms and Jnet Na^+ fluxes in tissue from TPN animals. The precocious development of sucrase, maltase and glucose-stimulated Na^+ transport indicates that TPN, despite producing mucosal atrophy, stimulates accelerated postnatal maturation of the small intestine.

603 MID-ARM CIRCUMFERENCE/HEAD CIRCUMFERENCE RATIO (MAC/HC) AS AN ANTHROPOMETRIC MEASURE OF PROTEIN-CALORIE DEPRIVATION IN PRETERM INFANTS. Michael K. Georgieff, Sharon R. Moskowitz, Gilberto R. Pereira, and John B. Watkins. Univ. of Minnesota School of Medicine, Dept. of Pediatrics, Minneapolis, MN; Univ. of Penna. School of Med., Children's Hosp. of Phila., Dept. of Pediatrics, Philadelphia, PA.

MAC/HC has been a useful anthropometric measure of malnutrition in older infants. Since standards have not been established for term or preterm neonates, we measured MAC/HC on day 3 of life in 104 term and 100 preterm infants (EGA 37.5-43 and 26-37 wks). A strong correlation between increasing gestational age and MAC/HC was found defining a standard curve y=.0056x + .066 ($r=.85; p<.001$). The MAC/HC of 25 preterm infants was then determined at 1 week intervals for 6±3 weeks (avg±SD). All infants were AGA, without hydrocephalus by ultrasound. 88% (22/25) of infants demonstrated a decrease in the MAC/HC during the first week postnatally and then fell to values below -2SD from the curve. By hospital discharge, 23/25 regained their birth HC percentile, but only 5 infants regained birth MAC/HC percentile. The mean caloric and protein intakes were significantly lower during weeks when MAC/HC decreased than when it increased (mean age at increase 2.9 ±1.1 wks). Caloric intake: 76±28 vs 104±24 Kcal/kg/d; $p < .001$; protein intake: 1.75±.8 vs 2.5±.8 gm/kg/d;$p < .001$. CONCLUSIONS: 1) The MAC/HC increases with gestational age. 2) Preterm infants fall off the standard curve on the basis of protein-calorie deprivation. 3) HC returns to its original percentile before MAC/HC demonstrating head-sparing at the expense of body mass in preterm infants. 4) Preterm infants remain below the MAC/HC standard curve at discharge despite presumably adequate weight gain and protein and calorie intake.

604 A PROSPECTIVE, RANDOMIZED, DOUBLE-BLIND STUDY OF GASTROESOPHAGEAL REFLUX SURGERY: NISSEN FUNDOPLICATION VS. ANGELCHIK PROSTHESIS. Glenn R. Gourley, John R. Pellett, B Ulysses K. Li, Cheryl M. Thoreson, William Adkins Jr., Gerard B. Odell, University of Wisconsin Hospitals, Depts. of Pediatrics and Surgery, Madison, Wisconsin.

In order to compare the standard Nissen fundoplication with the more recent Angelchik anti-reflux prosthesis, 20 pediatric-sized, developmentally disabled patients were prospectively randomized to receive either of these gastroesophageal anti-reflux procedures. The two groups were comparable at the time of surgery with regard to age, weight, surface area, preceding weight gain, emesis, number of chest x-rays, medications, lower esophageal sphincter pressure and number and duration of reflux episodes during standard acid reflux testing. The Angelchik group required significantly less anesthesia time than the Nissen group, 111.7±19.7 min (mean±SD) vs. 163.8±24.8 min ($p < .001$). There was no difference in length of post-surgical hospital stay. Six months after surgery, both techniques were effective, and no differences were seen between the two groups in the following evaluations: mean subjective assessment scores; decreases in emesis, numbers of chest radiographs, hospital days or medications; increased lower esophageal sphincter pressure; or decreased numbers and duration of reflux episodes during acid reflux testing. The Nissen group gained significantly more weight during the 6 months after surgery, 9.8±4.6 lb (mean±SD) vs. 2.4±4.4 lb ($p < .01$). Further study of this recent surgical development is indicated.

605 A RAPID METHOD FOR COLLECTION AND ANALYSIS OF BILE PIGMENTS IN HUMANS. Glenn R. Gourley, Frank L. Siegel, Gerard B. Odell. U. of Wisconsin Hospitals, Depts. of Pediatrics and Physiological Chemistry, Madison WI.

Duodenal fluid was collected using an Entero-test^R string, which was swallowed at bedtime and removed the next morning. Fluid squeezed from the string was centrifuged 4 min and injected into a reverse-phase HPLC system equipped with a Guard-PAK^R pre-column module and C-18 µBONDAPAK^R column. Pigments were eluted with an acetonitrile gradient. Peaks were identified by: a) standards prepared from TLC of rat bile; b) in-vitro incubations of UDP-sugars (glucose, xylose, glucuronic acid) and bilirubin isomers (IIIα, IXα, XIIIα) with liver microsomes; and c) referral to Onishi's method (Biochem J 159:1899, 1980). Total bilirubin diglucuronide (DG), monoglucuronide (MG) and monoglucoside-monoglucuronide diester (DE, tentative assignment) account for more than 90% of the 436-nm peak areas. This has been defined as 100% in the following table; data = mean±SD.

Subj	n	DG	DE-I	DE-II	MG(C-8)	MG(C-12)	MG-Total
19♀	27	80.6±8.5	7.2±2.3	1.8±1.4	5.2±3.8	4.9±3.6	10.3±7.5
15♂	15	76.5±10.3	6.5±2.8	2.0±1.5	7.6±4.3	6.9±3.8	15.1±8.5
4 GS	4	65.4±15.4	3.3±1.7	0.8±0.9	15.0±7.3	14.0±6.1	30.5±13.9
Sig: ♂ v GS:		NS	$p < .05$	NS	$p < .025$	$p < .01$	$p < .025$

This method is safe, reproducible, requires no derivatization or extraction and is easily performed in the ambulatory setting. Bile pigment composition is similar in males and females and independent of estrus. Analysis of 4 male patients with Gilbert's syndrome (GS) demonstrates the increased excretion of MG seen in this condition.