● 602 SUPERIOR EFFICACY OF THE PRONE ELEVATED POSITION IN TREATMENT OF POST-PRANDIAL GASTROESOPHAGEAL REFLUX.

W.F. Meyers, J.J. Herbst, and S.G. Jolley, Univ. of Utah, Dept. of Peds. and Surg., Salt Lake City, Utah.

Positional therapy for gastroesophageal reflux was evaluated by extended pH monitoring of the esophagus during the post-prandial period in 28 normal and 45 reflux patients. Frequency of reflux (F), percent time the esophagus was pH<4 (%) and mean duration of reflux (MD) were determined while awake, asleep, supine, sitting, and prone on a board with the head elevated 30^0. In normals, position or state of alertness did not affect reflux. Compared to normals, the increased % in reflux patients while awake ($p<.001$) was mainly related to increased F ($p<.001$) and normal MD; while asleep the increased % ($p<.05$) was related to normal F and prolonged MD ($p<.05$). Reflux patients have less % while on the board than while sitting or supine, both awake and asleep ($p<.05$). MD while asleep on the board was less than supine ($p=.05$), but F was unchanged; while awake, F was less on the board ($p=.02$) than supine, but MD was unchanged. These data demonstrate that alertness and position affect gastroesophageal reflux only in abnormal patients. The major determinant of increased acid exposure to the esophagus in reflux patients varies with the state of alertness, being mainly frequency of reflux while awake and prolonged duration while asleep. The prone elevated position effectively reduced these determinants in refluxers compared to supine positioning. The same effect could not be demonstrated for the sitting position.

603 UREA NITROGEN EXCRETION OF CRITICALLY ILL CHILDREN.

John J. Mickell (Spon by H. Maurer) Medical College of Virginia, Department of Pediatrics, Richmond, Va.

Urinary urea nitrogen (UUN) excretion as an index of protein catabolism was assayed in 32 children (2m to 15y, median 6y)(50% mechanically ventilated) during an ICU course of 1 to 10 days (median 3d). Mean daily UUN excretion was 171 ± 89 mg/kg (4.38 ± 2.22 gm/m^2), with greater excretion within 24 hours of ICU admission than subsequently. Average daily nitrogen balance per child was - 146 ± 82 mg/kg (-3.73 ± 2.04 gm/m^2), and was independent of caloric intake.

Average daily UUN excretion per child was well described by regression equations for weight (mg = 219.76(kg) - 1.74$(kg)^2$, r^2 = 0.908), height (mg = 4.07(cm) + 0.25$(cm)^2$, r^2 = 0.917), and meter squared body surface area (mg = 4421.5(BSA), r^2=0.903).

Excretion data in mechanically ventilated versus spontaneously breathing children, and in 4 diagnostic subgroups (sepsis 6, Reye syndrome 7, elective surgery 7, and miscellaneous 12) was evenly distributed about regression lines for length, weight, and body surface area. Increased UUN excretion accompanied isoproterenol infusion and prednisone administration. Decreased excretion accompanied insulin infusion and high blood levels of barbiturates.

This study documents the magnitude and time course of protein catabolism in critically ill children and suggests rarely considered drug effects. It confirms progressive protein depletion at per kg rates of UUN excretion comparable to critically ill adults with wide individual variability but little variation between diagnostic subgroups.

604 NEONATAL GASTROSCHISIS/OMPHALOCELE: PROGRAMMED SURGERY PLUS INTENSIVE NUTRITION.

C.E. Mize, W. Dammert, T.P. Votteler. Univ. of Tx. Health Science Ctr. at Dallas & Children's Medical Center, Dallas.

To attempt to improve outcome in gastroschisis (G) and omphalocele (O), a combination of defined surgical technique and total parenteral nutrition (TPN) has been undertaken over the past 5 years. Among 47 patients (26 G, 21 O), primary surgical repair was emphasized for correction (74%), with Silon closure in 10/47. A protocol of TPN-peripheral and/or TPN-central was employed in 23/26 with G, and 5/21 with O. Overall survival was 88% with G and 67% with O. Excluding multiple malformation syndromes, 37 of 40 infants survived. Bacterial sepsis occured in 8 patients, all in the first 32 months. Minimal surgical morbidity was evident. Selected hormones were measured in several patients under approximated steady-state conditions of controlled infusion ≥ 24 hrs following incremental caloric input with controlled amino acid (AA) load. Plasma glucagon, high initially (190-245 pg/ml), was lowered moderately (50-195 pg/ml) as glucose input increased. Plasma insulin, normal or low initially (2-6 uU/ml), increased moderately (8-38 uU/ml) with increasing glucose. Different AA loads (1.5-4.5 gm/kg/d) did not appreciably affect these responses. Plasma cortisol values were not altered. We conclude that low mortality can be obtained with a programmed surgical and nutrition team protocol. Medical and surgical complications are low, and steady-state high-glucose infusion produces only moderately altered levels of insulin and glucagon.

605 A NUTRITION SURVEY OF PEDIATRIC INPATIENTS.

C.E. Mize, A.F. Strickland, B. Teitell, C. Cunningham, J. Parker. Univ. of Tx. Health Sci. Ctr., Dallas, and Children's Medical Center (CMC), Dallas. (Sponsored by C.W. Fink)

To assess the state of nutrition of patients hospitalized at CMC, objective data were obtained by physical and biochemical measurements. Anthropometrics, body weight, and clinical observations were made by the CMC Nutrition Support Team on 74 of the total inpatient census of 77 patients during a single day. Available biochemical data were abstracted from the respective charts. 54% of patients <age 3 years and 19% of patients >age 3 years were at weights <5th percentile. In patients <age 3 years, 41% had head circumferences <5th percentile and 59% had mid-arm to head circumference ratios (MAC/FOC) <0.30. 32% of all patients had triceps skinfold thicknesses <5th percentile; the same percentage had calculated arm-muscle circumferences <5th percentile. 59% of patients had one or more clinical changes of mucous membrane, nail bed, tongue, skin, or hair associated with nutritional deficit. Hemoglobin concentration was <11 and absolute lymphocyte count <3000 in 14% and 39% of all patients, respectively. An increasing percentage of patients <age 4 years had abnormal McLaren ratios with increasing length of in-hospital stay; for consecutive days in-hospital, patients with MAC/FOC <0.30 were: ≤2 days-31%, 3 to 14 days-60%, 15 to 102 days-82%. We conclude significant undernutrition exists in this hospitalized urban population. As undernutrition can adversely affect patient response to medical care, such data can help define prospective nutrition support needs as a key adjunct in medical decisions.

606 ETIOLOGY OF THE HYPERSECRETINEMIA IN THE NEWBORN ANIMAL.

Farhat Moazam, Bradley M. Rodgers, Byron E. Kolts and M. Claire James. University of Florida College of Medicine, Shands Teaching Hospital, Departments of Surgery and Pediatrics, Gainesville, Florida.

A state of hypersecretinemia has been established in the human neonate, as well as the newborn swine. The etiology of this phenomenon remains unknown. The mean fasting serum secretin levels in 16 newborn swine were found to be 298.0 pg/ml (SD±18.8), significantly higher than those in the adult animal. Intraduodenal infusion of 0.1N HCl produced dramatic elevations of the serum secretin levels to 2090.5 pg/ml (SD±1360.4), whereas intraduodenal infusions of sugar and normal saline failed to produce statistically significant changes. Acetic acid extract of duodenal mucosa revealed secretin concentration of 1.82 gm/gm wet tissue weight, comparable to adult values, and ruling out increased tissue content as the etiology of hypersecretinemia. Only a single molecular species of tissue secretin, identical to that found in adult animals could be identified. The mean disappearance half-life of exogenously administered secretin determined in five newborn swine, was found to be 3.6 minutes, significantly prolonged when compared to values in adult swine. These data are consistent with the hypothesis that fasting and acid stimulated serum secretin levels are higher in the newborn than in the adult swine and that delayed secretin degradation can be implicated as a factor in the etiology. Whether a prolonged secretin half-life and not increased production is also responsible for the hypersecretinemia in the human neonate, requires further investigation.

607 BIOTIN DEFICIENCY: A NOVEL COMPLICATION OF PARENTERAL ALIMENTATION.

Donald M. Mock, William M. Liebman, Alfred DeLorimier. G.C.R.C. and Depts. of Pediatrics, Medicine and Surgery, Univ. of California, San Francisco, Calif.

All reported cases of biotin deficiency in man have been associated with prolonged ingestion of substantial amounts of raw egg white. A 12-month-old girl developed facial and perineal rash, alopecia totalis, waxy pallor, hypotonia, and irritability while receiving total parenteral alimentation (TPA) for short gut syndrome. Deficiencies of zinc and essential fatty acids (EFA) were ruled out. Biotin deficiency was documented by biotin levels and urinary excretion of organic acid.

	Before Biotin	After 1 wk of 10 mg Biotin/day	After 4 wks of 0.1 mg Biotin/day	Normal Range
Biotin in Body Fluids				
Plasma (pg/ml)	135	1.15×10^4	-	215-750
Urine (ug/day)	0.94	1.23×10^4	168	6-50
Organic Acid Excretion (umol/mg Creatinine)				
Methyl citrate	0.115	<0.01	<0.01	<0.01
3 methylcrotonyl-glycine	0.717	<0.01	<0.01	<0.01
3 hydroxyisovalerate	0.345	<0.01	<0.01	<0.16

The clinical and biochemical abnormalities resolved with biotin supplementation alone and did not recur with supplementation at normal biotin requirements (0.1 mg/day). Acquired deficiency of biotin, as well as zinc and EFA, must now be considered when rash and alopecia appear in patients receiving TPA.