637 A FUNCTIONAL MEASURE OF VITAMIN E VALIDATED. Harry A. Cynamon, J. Nevin Isenberg, Co H. Nguyen. (Spon. by Geraldine K. Powell) University of Texas Medical Branch, Department of Pediatrics, Galveston.

A sensitive, standardized method of measuring a biological function of vitamin E(E) is needed to define a protective E level. We therefore evaluated the release of thiobarbituric acid reacting substances(TBARS) from red blood cell(RBC) membranes after paired incubations in buffered H_2O_2, pH 7.4, alone and with azide to promote maximal release. TBARS was quantitated spectrophotometrically. Values were expressed as the ratio of TBARS release without azide/maximal release x 100 (%TBARS). Individual fasting plasma lipid levels were added to give total lipids(TL). Three groups were compared: A) E sufficient noncholestatic children (N=14); B) E sufficient noncholestatic adults (N=6); C) E deficient cholestatic children (N=11).

Results show a strong negative correlation in all subjects between %TBARS and E levels, E/TL, E/cholesterol (r=-.84,-.89, -.89,p<.001). Significant differences in E and E/TL in groups A or B vs C are reflected by marked differences in %TBARS release (p<.001). Groups A+B had higher maximal TBARS release vs C (p<.05). Values listed below are mean ±SD.

Group	E(μg/ml)	E/TL(mg/gm)	%TBARS
A	9.8±2.6	2.5±0.7	2.0±1.7
B	13.7±4.6	2.5±0.5	2.2±1.6
C	0.9±0.7	0.2±0.1	53.1±10.6

We conclude that %TBARS release provides a sensitive measure of E level and biologic function that could be utilized in clinical assessment of E-sufficiency.

638 NUTRITIONAL STATUS IN FED AND UNFED CHILDREN RECEIVING HOME PARENTERAL NUTRITION. Anders K Dahlstrom, Birgitta Strandvik, Joel D Kopple, Marvin E Ament. Department of Pediatrics and Medicine, UCLA Medical Center, Los Angeles, and Karolinska Institute,Stockholm.

Nutritional status and growth were evaluated in 19 children who received home parenteral nutrition(TPN). In 9 pts(age 32±17 SD months, group I), TPN was the only source of nutrition; 10 pts(age 34±16 months, group II) received less TPN and ingested 30 to 70% of their total caloric intake. Energy and amino acid intake from TPN was 81±26 and 110±41% of RDA in group I and 67±15 and 67±29% in Group II. Group I and II had received TPN for 32±10 and 33±17 months, respectively, at evaluation. All pts in Group I and four pts in Group II had short bowel syndrome; five in Group II had pseudo-obstruction syndrome. At the onset of TPN, height and weight were significantly below normal in both groups. At the time of evaluation, group I had normal height (Z scores(Z)= -0.63±2.11) and, for chronological age, normal weight (Z=0.94 ±2.13), mid-arm circumference (MAC)(Z=-0.47±1.47), mid-arm muscle circumference (MAMC)(Z=0.69±1.0), and triceps skinfold thickness (TSF)(Z=0.40±0.87). In contrast, in Group II patients, height (Z=-1.15±1.02), MAC(Z=-1.53±1.33), and TSF(Z=-1.17±0.64) were significantly below normal, and their weight, MAMC and TSF were lower than in Group I. These data indicate that children undergoing long term TPN can obtain and maintain normal height, weight and other anthropometric parameters of nutritional status. The poorer growth and nutritional status in Group II may be due to an overestimation of the food ingested and absorbed; they need more calories from TPN to normalize growth.

● **639** TAURINE SUPPLEMENTS IMPROVE FAT ABSORPTION IN PATIENTS WITH CYSTIC FIBROSIS. P. Darling, G. Lepage, C. Leroy, P. Masson, and C.C. Roy. Univ. of Montreal, Dept. of Pediatrics, Hôpital Ste-Justine, Montreal.

Patients with CF lose large amounts of bile acids in their stools. As a result, they have an increased proportion of glycine conjugated bile acids with diminished tauroconjugates which could contribute to fat malabsorption. Twenty-two CF children with steatorrhea were supplemented with taurine (30 mg/kg/day) and placebo during separate 6 month treatment periods. A predominance of taurine conjugates was observed in 2 patients tested during taurine supplementation. On taurine, steatorrhea was reduced (p<0.05) by 17.6±9.7% in 19 patients who completed the study. In contrast to long chain saturated fatty acids, there was no change in linoleic acid excretion. In the 10 patients with a more severe degree of steatorrhea the decrease in fat loss approached 20% and a close relationship was found (r=0.84, p<0.01) between the extent of the fatty acid loss on placebo and the decrease of this loss on taurine. A linear relationship was found between the % decrease of individual fatty acids and their log solubility in water. No change was found in the daily excretion of bile acids, neutral sterols and nitrogen. Monitoring of growth revealed a marginal (p<0.1) increase of weight velocity expressed as a % expected for age (83.4±11.3→117.1±16.5). The increase in height velocity in response to taurine showed a more modest trend (95.3±7.8→ 110.7±10.6). These data provide support for the use of taurine supplements as an adjuvant form of therapy particularly in patients with a more severe degree of steatorrhea.

640 CLEARANCE OF INTRALIPID^R AND LIPOSYN^R IN LOW BIRTHWEIGHT INFANTS. Ramasubbareddy Dhanireddy, Kawaljeet Chawla and Kolinjavadi N. Siva Subramanian (Spon. by Philip L. Calcagno). Department of Pediatrics, Georgetown University Medical Center, Washington, D.C.

Intralipid^R(IL), a soybean oil emulsion, and Liposyn^R(LS), a safflower oil emulsion are both used in the nutritional support of parenterally fed low birthweight(LBW)infants. As the source of lipid is different in the two emulsions, the clearance from the circulation of IL and LS was investigated in seven LBW infants (GA 26-33 wks,BW 590-1870g). Serum triglyceride (TG) levels were determined during intravenous infusion at a week of postnatal age. A cross-over random study was designed utilizing either IL or LS, 0.5g/kg I.V., for a 4 hour period and followed 48 hours later by the other emulsion. Blood samples were collected at 0, 2, 4, 6, and 8 hours after the start of infusion. Serum TG levels were measured by enzymatic method on aca IV Du Pont discrete clinical analyzer. The results (mean±SD) were analyzed by paired t-test.

Emulsion	0 hrs	2 hrs	4 hrs	6 hrs	8 hrs	Δ0-4 hrs
IL	50.4±	99.8±	114.4±	89.0±	70.9±	64.0±
	14.2	34.4*	26.9**	23.5*	27.1*	28.4**
LS	60.6±	130.8±	178.6±	123.3±	98.7±	118.0±
	13.2	43.5	50.1	27.9	34.5	57.8

p*<0.05; p**<0.02

Conclusion: LBW infants achieve significantly higher serum TG levels during LS infusion than IL infusion and the higher levels persist even after four hours following the end of infusion. (Supported by a grant from Abbott Laboratories.)

641 IMPROVED SURVIVAL AND THE MORBIDITY IN VERY SHORT SMALL INTESTINE OF INFANCY WITH THE USE OF LONG-TERM PARENTERAL FEEDING. Stuart FA Dorney, Marvin E Ament, William E. Berquist, Jorge Vargas. UCLA School of Medicine, UCLA Hospital and Clinics, Department of Pediatrics, Los Angeles.

13 children with very short small intestine, <38cm of jejunoileum(JI), from the first month of life were managed on home parenteral nutrition(PN) between 1974 & 1984. Survival is compared with the collective reported data in this condition before 1972. 9 of 13(69%) have survived compared with 7 of 30(23%) previously. 5 discontinued PN with normal growth and development after periods of 4-32 months. 4 still receive partial(2) or total(2) PN after 9,55,66 and 68 months; all of these have grown normally. In the 3 combined categories of 15-38cm of JI without an ileocecal valve(ICV) and <15cm of JI with and without an ICV, 7 of 10(70%) have survived compared with 0 from 16 before 1972. 17 episodes of systemic catheter infection occurred; 14 were successfully treated without catheter removal. 6 children developed gallstones and underwent cholecystectomy for cholecystitis. Of 10 children in whom hepatic histology was obtained, 2 developed cirrhosis and 6 portal fibrosis; portal hypertension occurred in these but variceal hemorrhage did not. With long term PN, the length of JI necessary for ultimate survival off PN has been reduced from ≥15cm to ≥11cm with an ICV and from ≥38cm to ≥25cm without an ICV.

JI length (cm)	Ileo-cecal valve	Prior to 1972		1974-1984		
		Total	Survivors	Total	Survivors	Off PN
15-38	+	14	7	3	2	2
15-38	-	5	0	5	4	1
<15	+	5	0	3	3	2
<15	-	6	0	2	0	0

† **642** HEPATIC NA,K-ATPASE DEVELOPMENT IN THE RAT: IMPLICATIONS FOR "PHYSIOLOGIC CHOLESTASIS". L.Duffy, P.Karl, F.Daum, S.E.Fisher. (Spon: F. Lifshitz). Cornell Univ Med Coll, North Shore Univ Hosp, Dept Peds, Manhasset, NY.

Na,K-ATPase (NKA) is an important enzyme for the hepatic uptake of bile acids, a process thought to be immature in neonatal liver i.e. "physiologic cholestasis". The development of NKA activity was studied in Sprague-Dawley rats: fetal 18-20 d, newborn 1,3,5, 7,10, and 14 d, and adult. NKA activity was measured in both a crude homogenate (CH) and a plasma membrane (PM) fraction, using a system containing phosphoenolpyruvate and pyruvate kinase to prevent product inhibition by ADP (Alcoholism 8:390, Am J Phys 238:E38).

Age	n	CH NKA activity umoles Pi/g liver/hr	% adult	p value
		(x ± SE)		
fetus	27	43.4 ± 1.3	25	<0.01
1 day	24	72.6 ± 3.9	42	<0.01
3 day	16	76.6 ± 5.4	44	<0.01
5 day	25	112.1 ± 6.2	65	<0.01
7 day	10	107.7 ± 7.7	62	<0.01
10 day	15	108.6 ± 12.8	63	<0.01
14 day	18	119.9 ± 9.5	69	<0.01
adult	21	172.7 ± 7.2	100	--

NKA activity in the PM fraction per gram liver was comparable to that of the CH. A similar, but less striking pattern was seen when activity was expressed per mg protein. Hepatic NKA activity shows a developmental pattern which has not reached adult levels by 14 d. The "physiologic cholestasis" of the human neonate may be due in part to insufficient Na,K-ATPase activity.