† 672 PROTEIN METABOLISM OF PARENTERALLY FED NEONATES: COMBINED ^{13}C AND ^{15}N STUDIES. P.Pencharz, J.Beesley, U. Canagarayar, J.Van Aerde, J.Renner, P.Sauer, D.Wesson, P.Swyer. Depts Paeds & Surg, Research Institute, The Hospital for Sick Children, Toronto, Canada.

Recently we reported that rates of protein turnover in intravenously fed neonates were approximately 69% of the value in enterally fed babies. We speculated that this difference (4g/kg/d) represented gut protein synthesis. However we were concerned that these differences might be related to methodology rather than to a real biological difference. In order to resolve this problem we studied protein turnover in IV fed neonates using 1-^{13}C-leucine simultaneously with ^{15}N-glycine (the previous label). Twelve babies were studied. BW 2.34±0.16kg. Intakes: protein 3.2±0.2 g/kg/d; energy 88 3kcal/kg/d; N balance 284 19mgN/kg/d. The rates of flux (Q), protein synthesis (S) and breakdown (B) are shown.

	Q	S	B
	gN/kg/d	g protein/kg/d	
^{15}N label	1.72±0.07	9.88±0.54	8.11±0.54
^{13}C label	1.29±0.11	7.17±0.64	5.39±0.61

Turnover rates derived from the ^{13}C label studies are significantly lower ($p<0.01$) than those from the ^{15}N studies. Preliminary data from other investigators using ^{13}C-leucine in enterally fed neonates indicate a protein synthesis rate of approximately 11g/kg/d. There thus is a similar difference of approximately 4g/kg/d in protein turnover between enterally and IV fed neonates. We conclude that the lower rates of turnover in IV fed neonates are real and the difference of approximately 4g/kg/d represents gut protein turnover.

675 INTERACTION OF VITAMIN D (ViD) BETWEEN MOTHER AND FETUS AT TERM: EVIDENCE FOR RACIAL VARIATION. W. Pittard, B.Hollis, CWRU, D. Peds & Nutr., Cleve. OH.

Because the human maternal-fetal ViD relationship has not been described, we studied plasma from a group of white(n=12)and black (n=10)mother-infant diads at delivery following uncomplicated full term pregnancies. Antirachitic sterols were extracted, chromatographed, and quantitated using competitive protein binding assays. Compounds quantitated included vitamins D_2/D_3, 25 hydroxy vitamins D_2/D_3(25-OH-D_2/D_3)and 1,25 dihydroxy vitamins D_2/D_3(1,25-$(OH)_2$-D_2/D_3). In Table*=ng/ml and+=pg/ml

	VitD$_2$*	VitD3*	25(OH)D$_2$*	25(OH)D3*	1,25(OH)$_2$D$_2$+	1,25(OH)$_2$D$_3$+
MB[a]	.4±.4	.4±.4	12±11	7±3	24±11	41±17
MW[b]	.3±.2	.8±.5	16±5	12±5	35±18	26±14

MB[a]=black mothers MW[b]=white mothers All values=mean±SD

A strong correlation(r=.7)was noted between maternal and fetal plasma antirachitic sterols except vitamins D_2 and D_3. Although detectable in maternal plasma, vitamins D_2 and D_3 were undectable in cord blood plasma. Vitamins D_3, 25-OH-D_3, and 24,25-$(OH)_2$-D_3 were significantly($p<.05$)greater in white than black mother-infant pairs. Similarly black mother-infant pairs had significantly ($p<.05$)greater 1,25-$(OH)_2$-D_3 than the white diads. No significant ($p>.05$)racial differences were observed in comparisons of vitamin D_2 compounds. These data demonstrate a strong relationship between the ViD status of the mother and her newborn and indicate that fetal ViD metabolism begins with 25-OH D rather than ViD. Lastly, racial differences appear to exist in the ViD status of the maternal-fetal diad and may reflect genetic differences in antirachitic sterol metabolism.

673 THE RELATIONSHIP BETWEEN INFANT TEMPERAMENT AND ADIPOSITY IN HEALTHY INFANTS. G.R. Pereira, J.N. Kurtz, S.M. McKinney, J.R. Coleman. (Spon. by W.W.Fox). Dept. of Peds., Children's Hospital of Phila., Univ. of Pa. Sch. of Med. and Dept. of Nutrition, Drexel Univ., Philadelphia, PA.

The effect of caloric intake, 24 hour heart rate and infant temperament (Carey Scale) on adipose tissue deposition was studied in two groups of healthy 18 month old infants: Group I (N=10) had weight by length (W/L) and triceps skinfold thickness (TSF) above the 75%ile and Group II (N=11) had W/L and TSF between 25-75%ile of the growth chart. The caloric intake in infants in group I and II was comparable (mean ± SEM 102.3 ± 7.8 vs. 121.5 ± 10.7 kcal/kg/day). No significant differences in heart rate during awake and asleep periods were seen between the two gorups. The number of infants in Group I and II classified into four temperament categories varying from easy, intermediate low, intermediate high, and difficult were respectively 1 vs 3, 4 vs 3, 2 vs 5 and 2 vs 0. Multiple linear regression analysis applied to this data showed that an increse in scores for difficult temperament in infants in Group II correlated positively with caloric intake ($r^2 = 0.41$), and heart rate awake ($r^2 = 0.54$), and negatively with five skinfold thickness ($r^2 = -0.71$). Conversely, an increase in scores for difficult temperament in infants in Group I correlated negatively with caloric intake ($r^2 = 0.66$), positively with five skinfold thickness ($r^2 = 0.94$) and it was unrelated to changes in heart rate. This study shows that: 1) increased adiposity in infants studied was not explained by differences in caloric intake; 2) decreased adiposity observed in infants with difficult temperament was associated with elevations in heart rate suggesting either increased metabolic and/or physical activity of those infants; 3) the findings of increased adiposity in infants with difficult temperament warrant further investigation.

●676 NUTRIENT OXIDATION DURING CYCLIC TOTAL PARENTERAL NUTRITION (CTPN) WITH OR WITHOUT LIPID IN CHILDREN. Guy Putet, Jean-L. Bresson, Claude Ricour (Spon. by Francis H. Glorieux). INSERM U34, Lyon and Service de Gastroentérologie, Hôpital des Enfants Malades, Paris, France.

During CTPN in children, exogenous lipid infusion reduces the carbohydrate load which has to be given to fullfil the energy (E) needs for growth. The extent to which these lipids are oxydized and stored is still controversial. Two groups of children on long term CTPN (12 hour infusion at night) were studied; one received glucose (CHO) and the other glucose and intralipid (IL) as non-protein E intake (NPE). Lipids were infused at the end of the infusion period. NPE intake was 66 ± 8 and 65 ± 15 kcal/kg/d for CHO and IL respectively; O_2 consumption (VO_2) and CO_2 production (VCO_2) were monitored over 24 hours periods through an open circuit system. Nutrient utilization was calculated from urinary nitrogen output, non-protein respiratory quotient and VO_2. Expenditure was 47 ± 6 kcal/kg/d for CHO and 45 ± 6 for the IL groups. The table summarizes the nutrient utilization values (m ± s.d.):

	CHO (g/kg/d)		Protein (g/kg/d)		Fat (g/kg/d)	
	Int.	oxid.	int.	oxid.	int.	oxid.
CHO	17.6	10.5	2.10	1.04	0.0	0.4
n=5	± 2.2	± 2.5	± 0.30	± 0.50		± 1.3
IL	11.9	5.8	2.16	1.40	2.21	1.8
n=5	± 3.4	± 3.1	± 0.40	± 0.30	± 0.4	± 0.5

These results show that: 1) 83% of the E expediture derives from CHO oxidation, 8% from lipid oxidation and 9% from protein oxidation in the CHO versus 49%, 38% and 13% respectively in the IL; 2) E storage is almost identical in both groups (CHO: 18, IL: 20 Kcal/kg/d), although its composition may be different.

●674 RECTAL MUCOSECTOMY AND ILEO-ANAL ANASTOMOSIS (RMIAA) IN YOUNG PATIENTS: LONG-TERM FOLLOW-UP. Jean Perrault, Robert Telander (Spon. by Morey Haymond). Mayo Clinic and Mayo Foundation, Department of Pediatrics and Pediatric Surgery, Rochester, MN.

RMIAA with straight pull-through was done after colectomy in 47 patients for chronic ulcerative colitis (CUC) or familial polyposis (FP). All patients have been followed closely to permit continued assessment of this surgical technique.

30 of the 47 patients have been followed prospectively for >12 months after RMIAA by sending a detailed questionnaire every 6 months and yearly visits. Stool frequency is in the Table:

Months post-op	12	24	36	48
# of patients	30	19	20	10
Age:yrs-mos	19^5	18^{10}	19^4	19^{10}
(Range)	(12^6-31^5)	(13^{10}-25^7)	(14^5-27^3)	(15^3-24^9)
# of Stools-Day	6.2(0-10)	6.0(0-18)	5.0(2-9)	4.6(2-7)
(Range) - Night	2.1(0-4)	2.8(0-9)	1.9(0-4)	2.1(0-6)
Liquid/formed stools	3/19*	3/24*	3/22*	1/10*

Gross incontinence and perianal irritation were unusual (<2 pts/yr). All patients learned to discriminate stool from flatus and many did not use medications (6/19 at 12 mos, 4/10 at 48 mos). CBC, liver function tests, Vitamin B_{12} and stool fat were normal when checked. All patients were satisfied (50% very satisfied) at 48 mos (2 pts not satisfied at 12 mos).

Conclusion: RMIAA is well tolerated by young patients and may be a good alternative to Brooke ileostomy in CUC or FP. The frequency of stooling decreases gradually with time.

*Some patients gave more than 1 qualification.

677 EXCESSIVE MATERNAL DIETARY PROTEIN ALTERS FETAL BRAIN GROWTH IN THE STREPTOZOTOCIN INDUCED DIABETIC RAT PREGNANCY. Griffith E. Quinby and Tetsuo Nakamoto. (Spon. by Emmanuel Shapira). LSU Medical Center, Depts. of Pediatrics and Physiology, New Orleans, LA.

We studied the effect of various maternal dietary protein contents on fetal brain growth in streptozotocin-induced diabetic rats. Timed-pregnant dams were divided into two groups, one fed a 40% casein (40%) diet, the other a 20% casein (20%) diet. Diets were isoenergetic. On day 9 of gestation, half the dams in each group were rendered diabetic by IV injection of 40 mg/kg streptozotocin (20%D, 40%D). These dams were pair-fed to the non-diabetic dams. Dams were sacrificed on day 22 of gestation. DNA, RNA and protein content of the fetal brains were measured. No difference in fetal weight was attributable to maternal nutrition. Fetuses born to both groups of diabetic dams were significantly smaller than comparably nourished controls. Fetal brains in 20%D group were significantly smaller than 20%, but 40% and 40%D were not significantly different in weight. Brain cell number (DNA) was significantly greater in 20% compared to 20%D while 40%D was greater than 40%. The 40%D DNA contents per brain were essentially identical to the 20% control. Total brain protein content was significantly decreased in the 40% group compared to the 20% group, but was not affected by diabetes. Cell size (prot/DNA) was not different between 20% and 40% and was significantly decreased in the 40%D and increased in the 20%D when compared to their non-diabetic controls. We conclude that maternal dietary protein content can significantly influence the growth of the fetal brain in the diabetic pregnant rat.