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REPRODUCIBILITY OF METABOLIC BALANCE STUDIES (MBS) IN THE PRETERM INFANT. Richard J. Cooke and George Nichoalds. Univ. of Tenn. CHS, Depts. of Pediatrics and OB-GYN, Memphis, TN. (Spon. by Henrietta S. Bada)

To assess the reproducibility of MBS, two 84-hour (72 hours apart) MBS were performed in a group (N = 11) of well growing premature (birthweight 1360 ± 125 gms; gestation 32.3 ± 1.7 weeks; mean, SD) receiving Similac Whey® (N = 9) or Similac® (N = 2) for the duration of the study. Postnatal age and weight at the beginning of the study were 21.9 ± 8.1 days and 1549 ± 76 gm respectively. Nitrogen (N2) content was measured by Kjeldahl analysis. Growth and N2 balance are outlined below.

Period	Growth/kg/100 cal/day (Mean, Standard Deviation)		
	Weight(gms)	Length(cms)	Head circumference (cms)
Period 1	20.9 ± 3.9	.08 ± .04	.27 ± .10
Period 2	20.9 ± 3.8	.11 ± .05	.27 ± .09
P	NS	<.05	NS

Period	Nitrogen Balance (Mean, Standard Deviation)			
	% of Intake			
	Absorption	Retention	Absorption	Retention
Period 1	86.6 ± 3.4	68.5 ± 5.3	343 ± 67	273 ± 62
Period 2	86.7 ± 4.4	71.1 ± 6.8	374 ± 57	312 ± 54
P	NS	<.05	NS	<.05

Weight, head circumference and N2 absorption are similar. Enhanced N2 retention occurs and correlates with the increased length gain during period 2. We conclude that there are differences in metabolic balance status possibly reflecting an effect of postnatal age, a systemic error associated with MBS and/or compositional changes in growth.

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METABOLIC BALANCE STUDIES (MBS) IN THE PREMATURE INFANT. Richard J. Cooke and George Nichoalds. Univ. of Tenn. CHS, Depts. of Pediatrics and OB-GYN, Memphis, TN. (Spon. by Henrietta S. Bada)

Two consecutive (72 hours apart) 84-hour MBS were performed in 9 well growing premature (birthweight 1189 ± 165, mean, SD; gestation 31.6 ± 2.4) infants receiving both Similac® with iron and Similac Whey®. Infants were fed Similac Special Care® before the study began and subsequently received both formulas in a predetermined random fashion. Postnatal age and weight at the beginning of the study were 33.4 ± 14 days and 1550 ± 88 gms (mean, SD) respectively. Growth and metabolic balance data are outlined.

	Growth/100 cal/day (Mean, SD)		
	Weight(gms)	Length(cms)	Head circum.(cms)
Similac	20.9 ± 9.6	.08 ± .15	.10 ± .03
Similac Whey	23.2 ± 3.9	.12 ± .12	.13 ± .06
P	NS	NS	NS

	Retention mg/kg/100 cal/day			
	Nitrogen	Calcium	Phosphorus	Magnesium
Similac	41.4 ± 4.4	6.4 ± 2.1	6.3 ± 0.9	0.41 ± .15
Similac Whey	44.7 ± 3.5	5.1 ± 2.2	5.2 ± 0.1	0.43 ± .12
P	NS	NS	<.001	NS

Growth nitrogen, calcium and magnesium retention are similar during both study periods. The increased phosphorus retention probably reflects the higher phosphorus content of Similac (420 mg/L) when compared to Similac Whey (340 mg/L). We conclude that Similac and Similac Whey achieve equivalent growth in the older premature infant.

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COMPARISON OF OWN MOTHER'S MILK (OMM) WITH THREE FORMULAS IN NUTRITION OF VERY LOW BIRTHWEIGHT (VLBW) INFANTS. Peter A Cooper, Alan D Rothberg, Victor A Davies (Spon by M. Jeffrey Maisels), Witwatersrand Univ, Johannesburg Hospital, Dept Pediatrics, Johannesburg, S. Africa.

VLBW infants <1600g at birth were fed OMM if available or randomly assigned to 3 formula groups: A (2.4g protein/100 kcal, whey 60%); B (3.3g protein/100 kcal, whey 18%); C ("Premature formula"; 2.9g protein/100 kcal, whey 70%; 50% fat as MCT; 25% carbohydrate as glucose). All groups of infants were fed at 120 kcal/kg/day. Growth data were calculated from achieving >100 kcal/kg/day to 2000g or 5 wks on the study. Data are means ± SD.

	OMM (n=9)	A (n=9)	B (n=8)	C(n=10)
Birth wt (g)	1265±209	1349±181	1393±172	1263±123
Wt gain (g/day)	19.5±2.9	18.8±2.4	18.3±1.8	28.0±4.6*
Length (cm/wk)	0.82±0.23	0.76±0.17	0.75±0.29	1.06±0.19**
Head (cm/wk)	0.98±0.17	0.95±0.12	0.85±0.13	1.07±0.14*
Skinfold (mm/wk)	0.19±0.08*	0.10±0.09	0.05±0.08	0.26±0.12**

*p <0.001 vs rest **p <0.05 vs rest
 *p <0.01 vs B **p <0.01 vs A & B

Groups A and B had greater base deficits than groups C and OMM while B had higher urea values compared with other groups. OMM had lower phosphate values than all other groups and higher alkaline phosphatase values than C. Group C had lower phenylalanine values than other groups while group B had higher tyrosine values than other groups, though only one infant was outside the normal range. Thus those on premature formula had best growth parameters with no evident biochemical problems.

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FUNCTIONAL RESULTS OF POSTERIOR SAGITTAL ANORECTOPLASTY FOR INTERMEDIATE AND HIGH IMPERFORATE ANUS. Kenneth L. Cox, Robert A. Cannon and Pieter A. deVries, Dept. of Pediatrics, Univ. of Calif. Davis, CA and Dept. of Surgery, Univ. of Kansas, Kansas City, Kansas. (Spon. by CF Abildgaard)

Previously, patients commonly had fecal incontinence following repair of intermediate & high imperforate anus. Using a posterior sagittal approach, deVries & Pena have modified previous techniques by pulling the bowel within the puborectalis & external sphincter under direct vision so as to preserve these structures.

This study reports the functional results in 7 patients (4 males; 3 females) who have had this surgery for high (6)/intermediate (1) imperforate anus. Their mean age is 3.5 yrs. (range: 3.0 - 4.3 yrs); the mean age of anorectoplasty was 1.2 yrs. (range: .9 - 1.6 yrs). 2/7 patients are continent, 4 have control with intermittent incontinence, and 1 has a colostomy. Rectal manometry revealed basal and maximal anal canal pressures in the 2 continent patients to be normal to high and below normal in the rest. Normal rectoanal reflexes and sensation of rectal distention was present in 5 of 7, independent of continence. Defograms revealed prominent posterior shelf of the puborectalis in all but 1 case who had incontinence.

Conclusions: 1) preservation of the puborectalis and external sphincter reduces fecal incontinence following high and intermediate imperforate anus repair. 2) Normal to high basal and maximal anal canal pressure appear to correlate with fecal continence.

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PROTEIN QUALITY AND QUANTITY IN PRETERM INFANTS ON THE SAME ENERGY INTAKE. P.Darling, G.Lepage, P.Tremblay, S.Collet, L.C.Kien, C.C.Roy. University of Montreal and the Medical College of Wisconsin, Hôpital Ste-Justine and Milwaukee Children's Hospital, Depts of Pediatrics.

Whey predominant formulas cause less metabolic stress in LBW infants but their nutritional benefit as well as that of casein hydrolysate formulas seem limited to a better % nitrogen absorption. Fifteen LBW AGA infants weighing 1.3-1.6 kg were assigned to 3 isocaloric diets differing in the quantity and form of nitrogen delivered. Nitrogen was fed as whole proteins with a whey/casein ratio of 60/40(I), 20/80(II) or as a casein hydrolysate (III) at concentrations of 310, 240 and 314 mg/dl. A balance study was done between 21 and 30 d after birth. Energy intake was the same (150 kcal/kg/d) and the % fat absorption was unaffected by the presence of 40% MCT in I and III. In subjects fed III, the % nitrogen absorbed (93.5±8) was greater than in those fed either I (87.2±1.7) or II (87.8±.7). Nitrogen retention as mg/kg/d and as mg/kg/100 kcal metabolizable energy on I (481.6±30.4 and 170.4±8.3) and on III (505.7±34.8 and 179.0±14.3) did not differ but was greater than on II (399.0±19.2 and 127.7±4.3). Daily weight gain from regained birth weight to 2200 g was the same on I (35.9±2.9) as on III (30.2±3.4) but lower on II (28.6±1.8). Height (cm/wk) and head circumference (cm/wk) monitored over 3 months also showed an advantage of I (1.05±.08 and .81±.04) and III (.90±.04 and .80±.03) over II (.84±.02 and .67±.04). These data suggest that on high energy intakes, protein quality may not affect nitrogen retention and growth unless the quantity of protein ingested falls below a critical level.

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SURGERY FOR ADOLESCENT AND PRADER-WILLI (P-W) OBESITY. William H. Dietz and David Tapper, Tufts University School of Medicine, New England Medical Center, Department of Pediatrics, Boston, MA. (Spon. by R.J. Grand).

We have done gastric bypass surgery on 10 morbidly obese adolescents, three of whom also had P-W syndrome. Surgical criteria included a weight > 200% of ideal body weight for height (IBW), significant morbidity from the disease such as hypertension, diabetes or Pickwickian syndrome, and failure of medical therapy. No acute surgical morbidity occurred. One patient has been lost to followup. Two P-W patients have plateaued after losing 49.7 kg and 25.9 kg. One P-W patient has regained the 20 kg he lost after surgery. The mean degree of obesity in the P-W patients decreased from 261% to 206% IBW, whereas mean weights for the non P-W group have decreased from 221% to 157% IBW. Mean weight losses in the non P-W group = 36.5 kg and are continuing. Lean body mass, studied by H₂¹⁸O, decreased by 5-10% in the first three post operative months but replenished thereafter. In all non P-W cases, plateaus in weight occurred 6-12 months post-operatively, but, in contrast to pre-operative circumstances, patients were able to alter their diets and resume weight loss. Staple line separation occurred by one year in three patients, and required reoperation in one. These results indicate that gastric by-pass surgery may be of considerable benefit to carefully selected obese adolescent patients.