1456 SHORT-LATENCY SENSORY-MEDIATED EFFECTS ON CARDIAC CYCLE TIME IN NEWBORNS.

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In adults, there is an inverse relationship between the onset of a simple tone relative to the beginning of a cardiac cycle and the duration of the associated interbeat interval. This effect of interest because it reflects the activity of brain areas impinging upon vagal motoneurones independent of baroreceptor reflexes. In an investigation of the effects of auditory stimulation upon HR response in healthy newborns, we randomly presented 1-sec, 75 dB-A, 250 Hz squarewave tones to 28 infants. Analysis of interbeat interval as a function of the quintile of the cardiac cycle in which the onset of the tone occurred, demonstrated that, like adults, the newborn exhibits a longer interbeat interval when tone onset occurs early in the cardiac cycle (non-parametric linear trend test $p < .05$).

This short-latency, sensory-mediated effect on cardiac cycle in newborns, which parallels adult effects, is promising as a technique for assessing maturation of intra-cranial mechanisms of cardiac control. Investigations with adults have demonstrated that cardiac cycle time effects are sensitive to cognitive manipulations. The existence of these effects in the newborn implies that neural pathways involved in processing external information may by assessed early in life with this simple, non-invasive procedure.

● 1457 GLYCEMIC EFFECT OF TRIGLYCERIDE INFUSION IN THE LOW BIRTH WEIGHT INFANT.

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Elevation of blood glucose is induced by triglyceride infusion in the newborn rat and in adult man either by stimulating gluconeogenesis or by decreasing glucose utilization. We evaluated the possibility of a glycemic response to triglyceride infusion in 9 infants with a birthweight of 1196±84 grams (M±SEM) and a gestational age of 30.0±0.5 weeks who were given a fat emulsion, 10% Intralipid (IL) at 6.5±0.7 days of age. All were clinically stable and were receiving glucose-amino acid infusions of 10.6± 0.8 mg/kg/min of glucose and 1.7±0.2 g/kg/day of amino acids. A control period of one hour prior to IL infusion documented a steady-state of glucose (<±6% variation of plasma glucose). Subsequently IL was infused at the rate of 1 gm/kg over 2 hours in addition to the glucose-amino acid infusion continued at the same rate as control period.

	BASELINE	IL INFUSION (MIN)	
PLASMA		60	120
Glucose (mg/dl)	78.7±9.3	99.4± 10*	123.8± 13*
Insulin (μU/ml)	15.5±3.0	20.9± 4**	34.9± 9**
FFA (mEq/L)	259±35	1081±172*	1967±343*

FFA=Free fatty acid, M±SEM, *$p<.01$, **$p<.05$ vs. baseline

FFA availability produces a significant glycemic response despite a concomitant rise in plasma insulin suggesting either enhanced gluconeogenesis or diminished peripheral glucose uptake. Hyperglycemia should be considered a potential untoward effect of rapid fat emulsion infusion in the low birth weight infant.

1458 RESPONSE OF INFANTS WITH LOW CARDIAC OUTPUT (LCO) TO DOBUTAMINE (Db).

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Drug therapy of LCO in the newborn has developed empirically with few cardiovascular (CV) studies. The effectiveness of Db at various dosages was evaluated in the treatment of 10 infants with LCO, 8 of which had failed to respond to prior treatment with cardiotonic drugs. Patients were 9 hrs to 7 wks old and diagnoses included infection (5), CV defects (4), and hemorrhage (1). Except for brief periods at higher dosages, Db was infused in dosages from 2-12 μg/kg/min for 7-123 hrs. Infusions of other pressors remained constant initially. If the patient responded favorably to Db, the other cardiotonic agent was discontinued.

Improvement was noted in decreased skin perfusion (100%), elevated atrial pressure (80%), metabolic acidosis (75%), oliguria (67%), arterial hypotension (67%) and tachycardia (60%). Four patients died including 3 with structural CV defects and 1 with hemorrhage. Tachycardia of 15-20 beats/min occurred in 3 patients at dosages above 12 μg/kg/min. No arrhythmias were induced or increased by Db.

Db appears to be effective for treating LCO in infants, primarily by increasing contractility and peripheral vasodilatation. Dosages should be limited to 2-12 μg/kg/min.

1459 RANDOMIZED CONTROLLED TRIAL OF VIT. E. AND BRONCHOPULMONARY DYSPLASIA (BPD).

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Infants <1500g birth-weight, and expected to survive >48 hours were randomly assigned to oral α-tocopheral 25mg (E) or drug vehicle (C) within 2 prognostic strata (B. Wt., and disease severity) in 4-patient blocks. Sample-size was determined using $\alpha = .05$, $\beta = 0.10$ for 50% reduction in incidence of BPD from an estimated 32%. Stage III and IV BPD was diagnosed by 3 independent radiologists on chest x-ray at 3, 4 and 6 weeks. Serum E levels at 1 week were significantly different ($E = 2.83 \pm 0.29$, $C = 0.89 \pm 0.08$) suggesting adequate absorption and compliance. Results on the first 138 patients were

	N	B.Wt.	G.A.	BPD(%)	Deaths	IPPV	$O_2 > 0.6$
E	67	1137 ± 32	29.4 ± 0.30	15(22%)	10	38	39
C	71	1102 ± 31	29.1 ± 0.34	17(24%)	11	44	40

BPD was not prevented by E. The groups were similar in B.Wt., G.A., sex-ratio, and ventilator and O_2 exposure in 1st 2 weeks. BPD occurred in 13/24 neonates receiving E, with B.Wts. <1000g and 13/30 controls <1000g. (N.S.). It was confined to ventilated infants; 13/20 E infants <1000g and ventilated, developed BPD compared with 13/23 similar controls. The results are unchanged if deaths in the first 2 weeks are included as BPD.

1460 MORTALITY OUTCOME IN A TERTIARY NEONATAL INTENSIVE CARE UNIT UTILIZING NURSE CLINICIANS IN PLACE OF PEDIATRIC HOUSESTAFF.

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Neonatal nurse clinician programs have been developed in part to meet the needs for clinical management skills and technical expertise usually provided by pediatric house officers. The question as to whether patient care can be effectively delivered by nurses has not been fully answered. Neonatologists became actively involved in neonatal care in South Dakota in 1978. Concomitantly, a nurse clinician training program was developed which included over 300 hours of didactic teaching, six weeks of applied clincial experience and a 34 week preceptorship in a tertiary nursery. Neonatal clinicians were taught to manage the transport and daily care of seriously ill neonates. The mortality for the unit fell from 20% in 1977 to 5.5% for the 1st 9 months of 1980. In addition, there were no fluctuations in mortality associated with housestaff rotation. Nurse clinicians now perform nearly 60% of all procedures. Neonatologists, in concert with nurse clinicians, can provide care at a level which compares favorably with other tertiary care centers. This care provides a high level of consistency and continuity not obtainable in the usual housestaff program. Neonatal clinicians are an effective alternative for situations in which there are an insufficient number of pediatric house officers.

1461 INDUCED FETAL HYPERINSULINEMIA AND MACROSOMIA.

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Human gestational diabetic pregnancies are associated with fetal macrosomia & delayed surfactant production, especially phosphatidylglycerol (PG). Excess serum myoinositol is associated with delayed appearance of PG.

Three female rabbits, with dated 27 day pregnancies were infused with D15/.2% saline for 48 hours (15 mg glucose/kg/min). Three controls were infused with D4/.2% saline for 48 hours (3 mg glucose/kg/min). Seventy-three fetuses were delivered at 29 days gestation. Although not all D15 treated fetuses were hyperinsulinemic, fetuses were easily divided into low insulin (<82 μU/ml) and high insulin (>140 μU/ml) groups.

	Weight	Serum sugar	Serum myoinositol
Low insulin	40.7±6.0 gms	62± 43 mg/dl	45.4±17 mcg/ml
High insulin	46.5±6.1 gms	216±142 mg/dl	98.0±33 mcg/ml
	$p<.001$	$p<.05$	$p<.01$

Alveolar lavages of fetal lungs with saline were examined for phospholipids, but no differences were found in percentages of sphingomyelin, phosphatidylcholine, phosphatidylinositol, phosphatidylserine, or phosphatidylethanolamine. PG was undetectable in all specimens.

Previous animal models for diabetic pregnancy have produced severe diabetes with anti-beta cell compounds administered to the mother. Fetal wastage & growth retardation often result. This model produces a late gestational hyperglycemic state with fetal hyperinsulinemia, macrosomia, & increased serum myoinositol.