

97 THE IMPACT OF COMPUTER-ASSISTED PARENTERAL NUTRITION (PN) FOR NEONATES. Kristine A. Quart, Robert L. Poole, Nick Mackenzie, David K. Stevenson and John A. Kerner, Jr. Stanford University Medical Center, Departments of Pharmacy and Pediatrics, Stanford, California.

We developed a computer program (CP) to: 1) automate repetitive calculations required to provide PN tailored to the individual needs of infants in our ICN; 2) reduce the time for the pharmacy to formulate each PN solution by generating a set of PN mixing instructions and bottle labels; 3) reduce housestaff time in ordering PN by utilizing an order sheet designed specifically for the CP where all the PN components are ordered on a per kg. basis daily. We wished to document time savings and possible clinical benefits of our CP use. 24 infants were studied retrospectively -- 13 pre-computerization (Grp. I) and 11 post-computerization (Grp. II). There were no differences in mean birthweight, gestational age, or duration of PN between the 2 groups. Each group's incidence of metabolic complications, such as protein or fat intolerance and fluid or electrolyte imbalance was compared. There was a slightly lower rate of serum phosphorus imbalance ($p < .05$) in Grp. II. There were no other significant differences in the clinical course of either group as determined by the parameters analyzed -- BUN, SGOT, alk. phos., triglycerides, Na, weight gain/week. However, after computerization housestaff time to write PN orders decreased from ≈ 20 min. to < 2 min./order and pharmacy time was decreased by ≈ 15 min./order. With a mean of 8 orders/day, this represents a savings in pharmacy time alone of \$10,950 per year!

98 EFFICACY OF NEONATAL NURSE CLINICIANS (NNC) IN CARE OF NEWBORNS (NB). Indra Rajagopalan, Mathilda Klupsteen, Angelo Ferrara. New York University School of Medicine, Dept. Peds., New York, N.Y.

The role of NNC in primary care has reached greater acceptability due to M.D. shortages. To test performance in Level II nursery (nsy), chart reviews of 2 consecutive years were done; the 1st year by residents (caring for all pediatrics) & the next year by NNC caring only for NB with no M.D. The nursery was supervised by the same neonatologist & with no changes in policies. To compare, a scoring system was developed in 3 areas: historical data, diagnostic approach (W/U) & management (Rx). Two frequently seen uniformly managed conditions (SGA-complete care & RDS-pre-transport care) were used.

TABLE 1 - MEDIAN SCORES BY CONDITIONS, BY PROVIDERS

CLIN. CONDITION	HISTORY DATA	W/U	RX
SGA (52 charts)	Max Score (MS) 13	MS = 20	MS = 14
32 M.D.	MD = 10	MD = 17	MD = 14*
20 NNC	NNC = 12*	NNC = 18.5*	NNC = 13.5
RDS (28 charts)	Max Score (MS) 13	MS = 16	MS = 26
12 M.D.	MD = 12*	MD = 16*	MD = 25
16 NNC	NNC = 11.5*	NNC = 15.8	NNC = 26*

* $P < .002$

Scores per item ranged from 0 (lowest) to 3 (highest). Total maximum score per category is listed in Table 1. 80 patients were screened. Interrater reliability of scores had 100% concordance. Wilcoxon unpaired rank test was used to detect difference between NNC & M.D. (1) NNC function better than M.D.s in acute care of pre-transports while M.D.s perform better on total care. (2) In M.D. shortage areas, NNC function well with acutely ill N.B.

99 CHILDREN WHO DO NOT EAT: THE DEVELOPMENTAL IMPACT OF NON-ORAL NUTRITION. Charles W. Ralston, Mary J. O'Connor. (Spon. by Richard Siegler) Univ. of Utah and UCLA Depts. of Peds. Salt Lake City and Los Angeles.

To examine the concern that disruption of early oral feeding patterns may delay development by altering normal psychosocial maturation, we reviewed the records of all children referred for evaluation of feeding and/or developmental problems who had had at least 2 months of non-oral nutrition (NON). 40 such cases were assessed with the Gesell Schedules or the Stanford-Binet between 1978 and 1983. The mean age at testing was 20.1 ± 13 mos. with an average of 15.5 ± 13 mos. of NON. 88% of the cases were begun on NON in the first 3 months of life.

Children with developmental (DQ) or intelligence quotients (IQ) < 80 ($n=11$) were on NON a greater percentage of their lives than those with scores > 90 ($n=15$) (92% vs 65%, $p < .01$). However, they also had more time hospitalized (72% vs 29%, $p < .01$), more medical complications ($p < .02$) and more frequent deficiencies in growth ($p < .005$). Not significantly different were the age at testing, the number of major surgeries, and the percentage starting NON in the first 3 mos. The high scoring group did have a better socio-economic rating (SES) ($p < .01$). The middle group ($n=14$) with DQ/IQ scores of 80 to 90, had ratings in most variables between those of the high and low groups.

Non-oral feeding alone is not an adequate explanation for the developmental problems seen in some children who require it. More likely factors are prolonged hospital stay and medical complications, the underlying medical syndrome and/or related social factors.

100 FETAL BEHAVIOR IN SHEEP MEASURED THROUGH A DOUBLE WALL PLEXIGLASS WINDOW. Henrique Rigatto, Michael Moore and Don Cates. Dept. of Pediatrics, University of Manitoba, Winnipeg, Canada.

The inability to see the fetus makes the assessment of fetal behavior impossible. To circumvent this problem we implanted a plexiglass window on the left flank of the ewe. Fetuses were instrumented for measurements of sleep, respiration and swallowing. Thirty-four fetal sheep were studied on 112 occasions. Six fetuses were delivered through the window at term and postnatal behavior was compared to intra-uterine behavior. Fetuses were observed for 1214 hours and videotaped for 312 hours. During resting conditions and during administration of agents known to stimulate fetal breathing; CO_2 , indomethacin, 5-HTP, pilocarpine and naloxone. During resting conditions the fetus alternated between periods of quiet sleep (high voltage ECoG) and active sleep (low voltage ECoG). In quiet sleep, movements were absent except for periodic generalized tonic discharges. Eye and breathing movements were absent. Sucking, licking and swallowing were also absent. In active sleep, movements were increased with powerful breathing activity. Sucking, licking and swallowing were present. The effect of CO_2 , indomethacin, 5-HTP, pilocarpine and naloxone was to increase or induce breathing without major change in state. Fetal wakefulness defined by open eyes and purposeful movements of the head were never seen in utero but were clearly observed after delivery. We conclude that fetal wakefulness as defined postnatally is not seen in utero and appears only after birth. (Videotape will be shown)

101 EVALUATION OF THE EFFECTIVENESS OF A REGIONAL POISON CONTROL CENTER (KRPC) IN PREVENTING EMERGENCY ROOM (ER) AND PHYSICIAN VISITS. George C. Rodgers, Jr., M. Ward Hinds, Joseph W. Skaggs, and Nancy Edwards. (Spon. by Billy F. Andrews) University of Louisville School of Medicine, Department of Pediatrics, and The Kentucky Regional Poison Center of Kosair-Children's Hospital Louisville, Kentucky and the Division of Epidemiology, Department for Health Services, Commonwealth of Kentucky, Frankfort, Kentucky.

A random telephone survey was conducted within the region served by the Kentucky Regional Poison Center. 222 recent exposure episodes were identified. Information on the following was obtained in each case: details of exposure, including the use of the KRPC and any treatment received; information about the victim and, if a child, the supervisor at the time of the incident; epidemiologic data about the family. In each case the exposure history was reviewed by one of us (GR) and the necessity for an ER or physician visit versus home treatment determined. 71 victims were seen by a physician or ER. 111 victims called the KRPC only; and an additional 37 called the KRPC, plus an additional source of information. Statistical analysis of the data revealed two confounding variables: whether someone else was called in addition to the KRPC and whether a parent or caretaker was involved with a pediatric victim. The odds ratio for an ER or physician visit as a function of KRPC usage was calculated for each confounder and a summary odds ratio was computed using the Mantel-Haenszel Method. Contact with the KRPC significantly decreased the probability of a ER or physician visit (odds ratio = 0.423, $p = 0.007$).

102 TEMPORAL ORGANIZATION OF BEHAVIOR IN PRETERM AND FULLTERM INFANTS Holly A. Ruff (Spon. by Michael I. Cohen)

Manipulative exploration from 6 to 12 months is an important means by which infants gather information about the objective world. We observed 18 low birthweight preterms of 7 mos. corrected age and 23 normal fullterms of 7 mos. as they responded to 6 widely different novel objects. Dependent measures were "examining" or intent scrutiny of the object along with manipulation; mouthing; and banging of the object. Latencies from the start of the trial to the first episode of each behavior and duration of behavior were scored reliably. Analysis of latencies showed that all behaviors were well differentiated in the fullterms, who examined before they mouthed and mouthed before they banged. The preterms showed no differentiation at all. Examining, therefore, has temporal priority for the fullterms but not the preterms. As a group, the preterms examined significantly less; also, for them there was no change in duration of examining over time, while for the fullterms, examining decreased as the object became more familiar. Sensory and motor deficits were ruled out as an explanation of the preterms' performance. The results suggest that the preterms were either less quick to detect that there was something about the object to be examined or took longer to organize an appropriate response to novelty. The value of such observations is supported by the fact that duration of examining at 7 mos. and Bayley Mental Development Index (MDI) at 24 mos. was more highly related (.69, $p < .01$) than 7 mo. MDI and 24 mo. MDI (.31, ns). Also, since examining at 7 mos. was not related to 7 mo. MDI (.0), it reflects a process not tapped by the Bayley.