

- 49 AUTONOMIC RESPONSE TO MOTHER'S VOICE IN NEWBORNS. William P. Fifer, Lisa M. Monti, Michael M. Myers and Brandon G. Yongue. (Spon. by L. Stanley James), Columbia-Presbyterian Medical Center, Depts. of Psychiatry and Pediatrics, New York, New York.

For many years heart rate change has been used as an index of psychophysiological reactivity in newborn infants. We have hypothesized that a parasympathetic component of heart rate variability (HRV), respiratory sinus arrhythmia (RSA), might provide a more sensitive measure of CNS reactivity to external stimulation. We investigated whether infants would show a differential response in RSA to a highly salient source of auditory stimulation - the maternal voice.

Twenty-five healthy full-term neonates were presented with alternations of a period of silence followed by a period of recorded mother's voice. The heart rate data were analyzed using spectral analysis which generated an estimate of RSA, i.e., the sum of spectral densities over the respiratory band. Results show that newborns had a significantly greater RSA during mother's voice as compared to periods of silence. As anticipated, mean heart rate and sucking, traditional measures of stimulus reactivity, showed less systematic changes during stimulation.

The use of RSA as a dependent measure of stimulus reactivity provides us with another method for investigating newborn perceptual and learning capabilities. Our data indicate that this measure of parasympathetic tone, in combination with other autonomic and behavioral measures, will enhance our understanding of the psychophysiological responses of newborn infants.

- 50 SPECIFIC EXPRESSIVE LANGUAGE DELAY: A LONGITUDINAL STUDY. Janet E. Fischel, Grover J. Whitehurst, Barbara D. DeBaryshe, Marie B. Caulfield (Spon. by John C. Partin) SUNY at Stony Brook School of Medicine, Dept. of Pediatrics, Stony Brook, NY.

Specific expressive language delay (ELD) is a developmental disorder characterized by substantial delay in expressive language, with age-appropriate cognitive and receptive language skill. Opinions differ widely on the clinical significance of ELD and whether it warrants intervention. Although negative sequelae in school achievement and mental health are noted in language disordered populations, there are no prospective longitudinal studies of 2 to 3 year old ELD children. The present study followed the language growth of a carefully defined sample of ELD children over the period just after diagnosis. Standardized assessments of IQ and expressive and receptive language were completed at initial visit and again four months later. Results indicate that the early developmental course of ELD is highly variable; some children show moderate progress, some full recovery and some little change in expressive language skill. Comparison was made between degree of improvement in this sample and that of a group of ELD children in a home-based treatment program. The correlates that emerge from the study allow for better informed treatment decisions and highlight the relevance of longitudinal analysis of ELD.

- 51 SINUS ARRHYTHMIA IN PRETERM INFANTS. James A. Garbanati,\* (Spon. by Arthur H. Parmelee), Crump Institute for Medical Engineering, University of California, Los Angeles, CA.

Sinus arrhythmia is the variation in heart rate attributable to respiration. Fox and Porges (1985) have found that the "amplitude" of sinus arrhythmia measured near birth is correlated with developmental outcome at 8 and 12 months of age. We wanted to determine if age and/or health significantly affected the manifestation of sinus arrhythmia in premature infants while in the Neonatal Intensive Care Unit (NICU).

Thirteen preterm infants were monitored over a 2-6 week period from as early as 30 weeks conceptional age (CA) to 35 weeks CA. Heart rate respiration, body movements, eye movements, eye openings and crying were recorded for 48 continuous hours per week in these infants. From these variables, sleep-wake states and sinus arrhythmia were determined.

Instantaneous heart rate (IHR) was determined for 1 minute epochs of quiet sleep using the method of Cheung and Porges (1977).

Fast Fourier transforms of the IHR were used to evaluate sinus arrhythmia. Results indicate that sinus arrhythmia is evident in preterm infants, and individual differences in this phenomenon may reflect the infant's health status and sleep state organization. Sinus arrhythmia appears to reflect the degree of biological organization of the preterm infant and his vulnerability to environmental perturbations in the NICU.

- 52 THE DEVELOPMENT AND STANDARDIZATION OF THE EINSTEIN ASSESSMENT OF SCHOOL-RELATED SKILLS - A TEST FOR PEDIATRIC USE. Ruth L. Gottesman and Frances M. Cerullo (spons. by Herbert J. Cohen). Albert Einstein College of Medicine, Department of Pediatrics, and Rose F. Kennedy Center, Bronx, New York.

Although pediatricians are showing an increasing interest and concern with regard to children with learning difficulties, there is a lack of well-standardized assessment tools to aid them in identifying these children. The Einstein Assessment of School-Related Skills (EASRS) is a brief (7-10 min), easily administered screening instrument that measures reading, arithmetic, auditory memory, language-cognition, and visual-motor abilities of children in grades K-5. Standardization testing took place in the fall, 1985 and in the spring, 1986 on over 2300 children in regular education classes in grades K-5 and on almost 200 children in the same grades who had been diagnosed as learning disabled (LD) by the Committee on the Handicapped in their respective school districts. The sample was selected to ensure representativeness of the full range of academic ability, socioeconomic status, and sex, as well as various urban and suburban regions in New York State. Analysis for both the fall and spring revealed a high level of discrimination on the total EASRS score between the normal and LD samples in grades 2-5 (numbers of diagnosed LDs in grades K-1 were too small for analysis). The median percent of regular education children in grades 2-5 passing was 77.5% in the fall and 75.0% in the spring, while only 22.5% and 16.0% of LDs passed the test in the fall and spring, respectively. These data indicate that the EASRS is a powerful device in helping the practitioner screen and identify children with learning difficulties.

- 53 RHYTHMIC ORGANIZATION OF SPONTANEOUS MOVEMENTS IN PREMATURE INFANTS  $\leq$  34 WEEKS GESTATIONAL AGE (GA). Marie J. Hayes, Savitri P. Kumar, and Maria Delivoria-Papadopoulos. Univ. of PA., Depts. of Psychology, and Pediatrics, Phila., PA. 19104

Alterations in sleep and activity states of premature infants have been used as an index of neurological maturity. The neurobehavioral status of infants 25 to 34 wks GA was investigated by examining the temporal characteristics of spontaneous behavior. In Phase I of the study, movement patterns of 10 infants were observed during at least 2 uninterrupted one hour sessions at weekly intervals. Motility was classified into 27 behavior categories and recorded sequentially in one minute time samples. In Phase II, the frequency and intensity of behavior activity in 9 infants was measured and recorded using a pressure-sensitive transducer under the infant's head and torso during three-hour sessions. The data were monitored on-line by an interface and personal computer system. In Phase I, all infants showed periodic bouts of vigorous activity which typically involved all muscle groups, including the face. Bouts of activity, mean  $\pm$  SE 26.3  $\pm$  1.05 sec in duration, reliably alternated with periods of quiescence, mean  $\pm$  SE 0.23  $\pm$  0.005/min. Fourier analysis of Phase II motility data showed evidence of cyclicity. Although a wide range of periodicities was found, motility rhythms clustered most frequently between 0.10 - 1.0 cycles/min. These motility cycle parameters concur with the relative incidence of activity in Phase I of study and suggest that oscillatory rate is a stable feature of premature motility patterning. Similar patterns have recently been reported in human fetal behavior. Our results are consistent with these findings and indicate cyclic motor activity may represent an endogenous characteristic of normal central nervous system function that is independent of events associated with early birth.

- 54 CHILDREN EXPOSED TO METHADONE IN-UTERO: COGNITIVE ABILITY IN THE PRESCHOOL YEARS. Karol Kaltenbach and Loretta P. Finnegan. Jefferson Medical College of the Thomas Jefferson University, Department of Pediatrics, Philadelphia, PA.

The outcome of infants born to drug dependent women maintained on methadone during pregnancy has been an area of special concern. The consequences of such exposure for the neonate and young infant have been widely investigated. However, there have been few studies to determine if preschool children exposed to methadone in-utero have impaired cognitive functioning. The purpose of this study was to evaluate the cognitive function of preschool children born to women maintained on methadone during pregnancy. Forty-five children (27 methadone exposed children (M) and 18 non-drug exposed comparison (C) children) were evaluated with the McCarthy Scale of Children's Abilities when the children were between 3-1/2 and 4-1/2 years of age. All children were participants in a longitudinal study examining developmental outcome from birth through 5 years of age. The mean daily maternal methadone dose during pregnancy was 38.42 mg, and 92% of the children required pharmacotherapy for neonatal abstinence. Student t-tests revealed no difference between groups on the McCarthy General Cognitive Index (GCI) or any of the 6 subscales. Mean scores were: GCI(M) 106.51, (C) 106.05; Verbal(M) 53.44, (C) 54.33; Perceptual(M) 55.51 (C) 53; Quantitative(M) 51.33 (C) 53.38; Memory(M) 49.51, (C) 52.27; and Motor(M) 52.29, (C) 50.44. These results indicate that the general cognitive ability of children in the pre-school years who have been exposed to methadone in-utero is not impaired.