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The respiratory jacket: a method for measuring static compliance in conscious children. A. D. Milner (*introduced by David Hull*) (*Institute of Child Health, London*). The methods currently available for measurements of static lung compliance in adults are difficult and have not been attempted with children.

Values for dynamic compliance in health and disease have been published but, unfortunately for the clinician, are least reliable in the presence of increased airways resistance.

A method for measuring static compliance in conscious children was described. The thoracic volume changes produced by connecting a child, by a mouth-piece, to a reverse plethysmograph, which acts as a pressure reservoir (Volume 1500 l.), are measured from the pressure changes produced in a respiratory jacket. The measurements are made after a period of voluntary overbreathing.

Early fed prematures: relation between fluid balance and weight change during first 4 days of life. Alan I. Murdock (*introduced by J. W. Scopes*) (*Nuffield Neonatal Research Unit, Hammersmith Hospital, London*). Fluid balance was determined on 9 healthy premature infants by measuring intake, urine output, stool H_2O output, and evaporative water loss. The babies were nursed in incubators and received milk (63 Kcal/100 ml) at daily rates of 60, 90, 120, and 150 ml/kg birthweight for the first 4 days of life. Their birthweights ranged from 1140 to 2690 g (mean 1894 g). The mean daily intake over the 4-day period was 105 ml/kg day (range 99 to 120 ml/kg day).

A consistent pattern of daily fluid balance occurred regardless of birthweight. The results indicated a negative fluid balance on the 2nd day that was repaired by the end of the fourth day. The mean loss in birthweight at age 96 hours was -18 g/kg. The difference between weight loss and fluid balance represented solid excretion in the stools primarily. The change in weight (g/kg per day) correlated strongly with fluid balance (ml/kg per day), ($r = 0.979$, $p > 0.001$). Thus when a baby gains (or loses weight), the gain (or loss) of fluid and solid substance can be reliably estimated from the change in weight, using the equation: Fluid balance = $5.9 \pm$ change in weight.

Study of altered behaviour patterns in children with coeliac disease. D. N. Challacombe and M. J. MacCulloch (*introduced by R. H. R. White*) (*Institute of Child Health, University of Birmingham*). This paper

describes a preliminary study of mood and movement patterns in children with coeliac disease, and the changes in these patterns in response to a gluten-free diet.

The depressed mood of children with this disorder has been frequently noted in the literature, but less well documented is the reduction of muscle tone, leading to restricted voluntary movements. These physical signs are often rapidly alleviated by a gluten-free diet.

By studying the behaviour of our patients and controls using ethological techniques we are beginning to define the changes in facial expression and bodily movement. At the same time by using an electronic floor area activated by movement we have also been able to quantitate some of our observations.

Plasma citrate levels during exchange transfusion. F. Harris and J. A. Black (*Department Child Health, University of Sheffield*). The unpredictable clinical deterioration occurring in newborn infants undergoing exchange transfusions has prompted another look at plasma citrate levels during the procedure. 17 infants requiring 20 exchange transfusions had serial estimations of plasma citrate during the procedure. Very high levels of plasma citrate were found and these levels correlated best with the age of the infant at the time of the transfusion. Because of the small number of infants no meaningful correlation between plasma citrate levels and clinical deterioration could be determined.

Permanent deficit of neurones in cerebral and cerebellar cortex following early mild under-nutrition. John Dobbing and J. W. Hopewell (*introduced by J. A. Davis*) (*Department of Child Health, University of Manchester, and Radiobiology Laboratory, The Churchill Hospital, Oxford*). In a search for lasting effects of early undernutrition on the developing brain, extensive use has been made of varying the litter size of rats at birth to produce growth retardation in the first three postnatal weeks. Many of the irrecoverable effects on brain as well as bodily growth are now well known. The former have been attributed to vulnerability of the developing brain in relation to its 'growth spurt', which coincides with the suckling period in the rat.

The present paper is a preliminary report of histological evidence of specific neuronal deficits in certain areas of cerebral and cerebellar cortex in rehabilitated adult animals previously growth retarded. Quantitative histology and area measurements by planimetry have