the ever-present threat of malnutrition of their children. It would have been an advantage if the plans had included a separate health and nutrition rehabilitation unit, where there should be a model, local kitchen to demonstrate the importance of keeping the cooking fire off the ground to prevent burns to toddlers; shelves for dangerous substances such as kerosene; and covered containers suitable for drinking water. Another useful addition might be a cheap model latrine for the home with details of its method of construction. Nothing is said about security—an ever-present threat to microscopes and even far less valuable materials: theft of simple equipment such as scales or the paraffin stove used for sterilising syringes for immunisation may be disastrous when there are no funds to replace them.

There is useful advice on simple laboratory construction and contents and on reception, clerical, sterilisation and stores areas. Fifty-two appendices include costing and construction plans for roads, water supply, and waste disposal. The cheap teaching aids described would prove immensely useful.

The value of such units is beginning to be more widely appreciated, and more and more countries will be planning them in the near future. Every doctor, nurse, or administrator concerned with the construction of a health centre or a small hospital will find this book a mine of practical information; while goverment offices with a responsibility for planning will find it will save them an enormous amount of effort and time.

[1] *A Model Health Centre.* Obtainable from the Conference of Missionary Societies in Great Britain and Ireland, 2 Eaton Gate, London SW1, price £3.

Pneumothorax in the newborn

Recognition of pneumothorax in the newborn is important, since it may sometimes need urgent treatment. In other instances, however, no active treatment is required at all; hence, proper management demands a knowledge of the natural history of the condition.

In normal vigorous newborn infants full aeration of the lungs is rapid and smooth during the first few breaths. Nevertheless, negative intrathoracic pressures transiently reaching 100 cm of water have been recorded during these breaths,[1] and not surprisingly from time to time there are alveolar leaks leading to pneumothorax and related complications such as pneumomediastinum and interstitial emphysema. These complications are particularly likely to occur if alveolar ventilation is uneven as a result of intrapartum inhalation of meconium or blood.

Radiological surveys in the 1930's when medical intervention was at a minimum, showed that pneumothorax was present in 1-2% of all newborn infants,[2 3] but very few required any treatment or showed any symptoms. An account of the problem in contemporary neonatal practice was given in a recent survey by Yu and his colleagues[4] from Oxford, where pneumothorax was detected clinically in 0·3% of live births. One-third of the cases occurred in term infants without evidence of underlying lung disease and, though some had required resuscitation at birth, in most the condition was associated with the aspiration of meconium or blood. Symptoms of respiratory difficulty from pneumothorax occur in this group of infants soon after birth, and usually within minutes, with tachypnoea, intercostal recession, displacement of the apex beat, and poor air entry on the affected side. Diagnosis should always be confirmed by radiography if possible, but if facilities are not immediately available and the infant's condition is deteriorating the diagnosis may be confirmed by needling the intrapleural space and aspirating air by a 20 ml syringe and three-way tap. The needle should be inserted into the second intercostal space in the mid-clavicular line and withdrawn as soon as the aspiration is completed. This procedure carries the slight risk of perforating the lung, and any infant in whom it has been performed must be watched very closely for the development of further pneumothorax.

If a pneumothorax is confirmed radiologically the decision to aspirate depends on the severity of the symptoms and whether or not they are progressing. Radiological evidence of tension pneumothorax with a completely collapsed lung and evidence of mediastinal shift or increasing respiratory distress are indications for needle aspiration or the insertion of an intrapleural drain connected to an underwater seal or one-way valve. In most cases, however, spontaneous resolution will take place, and this may be accelerated by the administration of oxygen.[5]

Two-thirds of the cases in Yu's study[4] occurred in premature infants with hyaline membrane disease, especially those requiring ventilatory assistance. Indeed, the risk of pneumothorax developing in infants requiring continuous distending pressures for the management of their ventilatory problem may be more than 20%.[4 6 7] Again the aetiological factor is increased transpulmonary pressure, whether due to intermittent positive pressure ventilation, constant positive airways pressure, or vigorous respiratory effort in association with stiff lungs. In these conditions pneumothorax usually occurs on the second or third day or even later, and the signs of diminished air entry or mediastinal shift may be difficult to detect in an infant with severe underlying pulmonary disease. The essential feature is a sudden or progressive deterioration in general condition, and since such infants are normally nursed in units with continuously available *x*-ray facilities the diagnosis can usually be confirmed before treatment is instituted. There is no place for needle aspiration except as an emergency under these conditions, since the major causative factor is a continuing one; an intrapleural drain should be inserted and left in place until the underlying pulmonary problem is resolved.

When this complication develops in the course of hyaline membrane disease the mortality is high. In the Oxford study it was 31%, whereas in the same unit the overall mortality from hyaline membrane disease is less than 10%.[8] This increased mortality may reflect the severity of the underlying disorder—and, indeed, in one-third of the cases the pneumothorax developed while the infants were breathing spontaneously—but the association with various techniques of ventilatory support suggests that, as with the administration of oxygen, the therapeutic margins are narrow. Their successful application requires painstaking control and monitoring, and of course the necessary skilled staff to supply this.

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[5] Chernick, V, and Avery, M E, *Pediatrics*, 1963, **32**, 816.
[6] Hall, R T, and Rhodes, P G, *Pediatrics*, 1975, **55**, 493.
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