With the first successfully treated patients in this country now in their mid-20s, it should soon be possible to obtain a direct estimate of the risk to the children of affected individuals. It seems reasonable to advocate in the children of such affected parents that the continuity of the oesophagus should be confirmed by passing a nasogastric tube before starting feeds.

Summary

A family is reported in which a boy, his mother, and his mother's sister all had oesophageal atresia. Previous reports of familial occurrence of the condition are reviewed, and it is concluded that the aetiology is, in most cases, multifactorial.

We thank Mr. D. J. Waterston for permission to report his patient.

REFERENCES

- Blank, R. H., Prillaman, P. E., and Minor, G. R. (1967). Congenital oesophageal atresia with tracheoesophageal fistula occurring in identical twins. *Journal of Thoracic and Cardiovascular Surgery*, **53**, 192.
- Carter, C. O. (1969). Genetics of common disorders. *British Medical Bulletin*, **25**, 52.
- Copleman, B., Cannata, B. V., and London, W. (1950). Tracheo-oesophageal anomaly in siblings. *Journal of the Medical Society of New Jersey*, **47**, 415.
- Engel, P. M. A., Vos, L. J. M., De Vries, J. A., and Kuijper, P. J. (1970). Oesophageal atresia with tracheoesophageal fistula in mother and child. *Journal of Pediatric Surgery*, **5**, 564.
- Forrester, R. M., and Cohen, S. J. (1970). Oesophageal atresia associated with an anorectal anomaly and probable laryngeal fissure in 3 siblings. *Journal of Pediatric Surgery*, **5**, 674.
- Freeman, N. V. (1969). Oesophageal atresia and tracheo-oesophageal fistula. In *Neonatal Surgery*, p. 198. Ed. by P. P. Rickham and J. H. Johnston. Butterworth, London.
- Grieve, J. G., and McDermott, J. G. (1939). Congenital atresia of the oesophagus in 2 brothers. *Canadian Medical Association Journal*, **41**, 185.
- Haight, C. (1957). Some observations on oesophageal atresias and tracheoesophageal fistulas of congenital origin. *Journal of Thoracic Surgery*, **34**, 141.
- Hausmann, P. F., Close, A. S., and Williams, L. P. (1957). Occurrence of tracheo-oesophageal fistula in 3 consecutive siblings. *Surgery*, **41**, 542.
- Lanman, T. H. (1940). Congenital atresia of the esophagus. *Archives of Surgery*, **41**, 1060.
- Sloan, H., and Haight, C. (1956). Congenital atresia of the esophagus in brothers. *Journal of Thoracic Surgery*, **32**, 209.
- Woolley, M. M., Chinnock, R. F., and Paul, R. H. (1961). Premature twins with oesophageal atresia and tracheo-oesophageal fistula. *Acta Paediatrica*, **50**, 423.

N. R. DENNIS*, J. L. NICHOLAS, and ILYA KOVAR
MRC Clinical Genetics Unit, Institute of Child Health; The Hospital for Sick Children, Great Ormond Street; and Queen Charlotte's Maternity Hospital, London.

*Correspondence to Dr. N. R. Dennis, MRC Clinical Genetics Unit, Institute of Child Health, 30 Guilford Street, London WC1N 1EH.

New method for arterial blood sampling in infants and adults

The conventional methods for obtaining arterial blood samples for gas analysis are not easy, nor are they free from certain potential errors. It is difficult to fill the dead space of a syringe with heparin solution without including small air bubbles which may also tend to stick between the barrel and the plunger. Finally, in newborn infants more blood tends to be withdrawn than is needed for the actual measurements. For these reasons, a convenient method has been devised for obtaining the small volume of arterial blood which is often all that is required for gas analysis.

Material and methods

A number 17 needle is connected by means of a short piece of silicone tube to a dry heparinized glass capillary tube having an outer diameter of 1.4 mm, a length of 100 mm, and a capacity of 50 μ l (Fig.).

FIG.—Device for puncture.

Depending upon the amount of blood needed, 1, 2, 3, 4, or even 5 capillaries are connected with a silicone tube. If large volumes are required there are capillaries each having a capacity of 150 μ l.

With this system we have performed punctures of the radial artery both in newborn infants and in adults. The radial artery lies on the radial side of the tendon of flexor carpi radialis, where in the infant repeated attempts may

be needed before a successful puncture is made. Entry into the artery is confirmed by pulsatile filling of the glass capillaries. It takes 1 to 2 seconds to fill each 100 mm capillary.

The dry heparin on the inner wall of the capillaries prevents coagulation and no stirring is required. The capillary tubes are left open, taken to the laboratory, and analysed at once. Clotting has never occurred.

If the baby has been quiet during sampling, highly reproducible values are registered from the successive capillaries. The Table shows the Po_2 values obtained

even when repeated punctures were made within one hour. It has proved easier than sampling arterialized capillary blood from an earlobe or heel prick in newborn infants.

A similar set of connected capillaries was also useful for fetal blood sampling by Saling's technique. The last capillary is then connected to a long piece of sterile silicone tubing, through which the blood can be sucked into the capillaries.

Summary

Simple arterial sampling is possible without risk when heparinized capillaries connected to each other with pieces of silicone tube are used and one end is fitted to a very thin injection needle (no. 17); after careful palpation the needle is inserted vertically into the arterial vessel. Pulse-synchronous filling of the capillaries indicates correct arterial sampling. The use of capillaries prevents errors due to dilution with heparin, to inclusion of air bubbles, and to transferring of the sample to the analyser. Furthermore, only the required amount of blood is sampled.

This study was supported by a grant from the German Research Council (DFG).

A. HUCH* and RENATE HUCH
Universitäts-Frauenklinik, Marburg; and Max-Planck-Institut für Arbeitsphysiologie, Dortmund, Germany.

*Correspondence to Professor A. Huch, Universitäts-Frauenklinik, Marburg, Germany.

TABLE

Po_2 values in successive capillaries

Case no.	Capillary Po_2 (mm Hg)		
	1	2	3
1	89	88	87
2	67	66	67
3	81	81	82
4	78	78	79
5	69	69	73
6	208	209	210
7	160	160	157
8	214	217	214
9	441	441	441
10	351	345	345

using three connected capillaries in 5 newborn infants and in 5 patients during inhalation of supplementary oxygen.

Discussion

This procedure has been used routinely in about 100 cases during the past year with no complications,