- 1 De Courcy-Wheeler RHB, Wolfe CDA, Fitzgerald A, Spencer M, Goodman JDS, Gamsu HR. Use of the CRIB (clinical risk index for babies) score in prediction of neonatal mortality and morbidity. *Arch Dis Child* 1995; 73: F32-6.
- 2 The International Neonatal Network. The CRIB (clinical risk index for babies) score: a tool for assessing initial neonatal risk of death and comparing the performance of neonatal intensive care units. *Lancet* 1993; 342: 193-8.
- 3 Pollack MM, Cuerton TT, Patel KM, Ruttimann UE, Getson PR, Levetown M. Impact of quality of care factors on pediatric intensive care mortality. *JAMA* 1994; 272: 941-6.
- 4 Gray JE, Richardson DK, McCormick MC, Goldmann DA. Coagulase-negative staphylococcal bacteraemia among very low birthweight infants: relation to admission illness severity, resource use and outcome. *Pediatrics* 1995; 95: 225-30.
- 5 Pharoah POD, Tarnow-Mordi WO, Mutch L, Parry G, Cockburn F, McIntosh N, for Scottish Neonatal Consultants Collaborative Study Group and International Neonatal Network. CRIB and impairment after neonatal intensive care. *Lancet* 1995; 346: 58-9.
- 6 Scottish Neonatal Consultants Collaborative Study Group and International Neonatal Network. CRIB (clinical risk index for babies), mortality and impairment after neonatal intensive care. *Lancet* 1995; 345: 1020-2.

Neonatal pulmonary arteriovenous malformation

EDITOR,—Persistent central cyanosis in a neonate with structurally normal heart on cross-sectional echocardiography presents a difficult diagnostic problem.

A term neonate with central cyanosis at 30 minutes of age had an otherwise normal examination. Echocardiography in the neonatal unit revealed a normal heart, with a moderate sized arterial duct. Failure to improve oxygenation led to mechanical ventilation and in view of the possibility of persistent pulmonary hypertension treatment was started with prostacyclin infusion. At 72 hours of age the child was randomly allocated to the conventional treatment limb of the Multicentre Randomised Controlled Trial of Neonatal ECMO. He was then transferred to our unit for inhaled nitric oxide therapy, but did not improve.

At 8 days of age he had a continuous murmur over the right lower chest. Colour Doppler echocardiography showed enlargement of left atrium, and a greatly increased venous return from the right lung. There was no detectable tricuspid regurgitation. Pulmonary arterial angiography showed a large pulmonary arteriovenous malformation (PAVM) involving the right middle and lower pulmonary lobes (figure).

At surgery, the right middle and lower lobes were extensively infarcted, and were resected. The child remains well at follow up nine months later. The case underlines the importance of obtaining detailed and repeated colour Doppler echocardiographic assessments before considering ECMO for such neonates.

PAVMs are congenital, but they rarely present in a neonate. Typically multiple, there have been reports of single lesions.¹⁻³ A well, term neonate who fails the hyperoxia test and has a structurally normal heart without evidence of persistent pulmonary hypertension

Right pulmonary arteriogram (RPA) showing the AV fistula (arrow); LA=left atrium.

should be investigated further for PAVM. Doppler echocardiography may occasionally help but angiography is required to confirm and demonstrate the lesion.

Transcatheter coil embolisation has been used as primary treatment,³ but surgical resection may be necessary in some infants.

K TRIVEDI
N SREERAM
Heart Unit,
Children's Hospital,
Ladywood Middleway,
Birmingham B16 8ET

- 1 Allen SW, Whitfield JM, Clarke DR, Sujansky E, Wiggins JW. Pulmonary arteriovenous malformation in the newborn: a familial case. *Paediatr Cardiol* 1993; 14: 58-61.
- 2 Grady RM, Sharkey AM, Bridges ND. Transcatheter coil embolisation of pulmonary arteriovenous malformation in a neonate. *Br Heart J* 1994; 71: 370-1.
- 3 Milovic I, Olvic D. Congenital pulmonary arteriovenous fistula with haemothorax in a neonate. *Z Kinderchir* 1989; 44: 109-10.

BOOK REVIEW

Ethics and perinatology. Edited by Amnon Goldworth, William Silverman, David K Stevenson, *et al.* (Pp 484, £50 hardback.) Oxford University Press, 1994. ISBN 0-19-262379-6.

During this past decade medical ethics has become a major growth industry. Departments of medical ethics have blossomed in many of the major universities which have medical and/or legal departments and in some universities which have neither. Many universities involve religious leaders from one or more faiths to provide a viewpoint which is guided by the ethics of the founders of these various religions.

Although neonatology must be judged one of the outstanding success stories of medicine during this past decade, it has proved to be one of the more ethically troublesome areas of

medicine. The value judgments of perinatologists have been subject to challenge not least by the perinatologists themselves. As John Lantos says in the foreword to this challenging and thought-provoking treatise: 'physicians, parents, judges, insurance company executives, politicians, journalists, philosophers, and theologians have had to re-examine fundamental questions about the meaning of human community. In many contexts, and in many ways, they question whether neonatology is a dramatic success or a misguided effort'.

In addition to this foreword, there is also a preface by George Cattermole and John Goheen, and an introduction by David K Stevenson and Emlé W D Young, which together give a thematic overview. I would urge readers of the book not to bypass these three introductory contributions as they set the scene and whet the appetite for the remainder of the book. The 'meat' of the book is a series of 14 topics each of which is debated by two people. Topics include maternal-fetal conflicts, futile treatment, quality of life, epidemiological data and decision-making, withholding and withdrawing treatment and actively hastening death, organ transplantation, therapeutic and non-therapeutic research, informed consent, government regulations in the United States and United Kingdom, together with the economics of perinatal care in both countries, paediatric nursing ethics, and religious influences on decision-making. Contributors to each of these well argued and described topics include doctors, nurses, economists, legal theorists, ethicists, and philosophers.

The importance of prenatal, perinatal, and postnatal care from a cost-health-benefit perspective is discussed in detail. In most of the debates between the two contributors to each topic there is no complete agreement or consensus, which serves to highlight the need to continue debate. For example, Lewitt questions Harvey's economic justifications for expanded prenatal care, claiming that it is uncertain whether real cost savings would result. His reservations about the efficacy of prenatal care and his claims about the cost-effectiveness of such care must be further debated. The inevitable fact that economics can and does 'intrude' on the provision of perinatal care, and on the need to justify expenditure in relation to quality of life and quality of death issues, seem imponderables as great as the comprehension of infinity. However, the minds of those of us involved in perinatal care must try to grapple with these questions.

In your management strategies do you know how you move from probabilities to preferences? Are you sure that you understand how much your own upbringing and education influences your decision making? Are your decision-making values any better or any worse than someone brought up and educated within a different society and religious system? I would recommend this text as a well conceived, well constructed, and well argued synopsis of current debate, and we as paediatricians should enter into this debate and not allow it to be 'hijacked' by 'ethicists'.

FORRESTER COCKBURN
Samson Gemmell Chair of Child Health,
University of Aberdeen