- 2 Office of Population Censuses and Surveys. *Mortality statistics 1984-1988: cause*. London: HMSO, 1985-90.
- 3 Collin J. The value of screening for abdominal aortic aneurysms by ultrasound. In: Greenhalgh RM, Mannick JA, eds. *The cause and management of aneurysms*. London, Saunders, 1990.
- 4 Fowkes FGR, Ruckley CV, Powell JT, Greenhalgh RM. Screening for abdominal aortic aneurysms. *BMJ* 1992;305:1013. (24 October.)
- 5 Mason JM, Wakeman A, Griffiths RK. Screening for abdominal aortic aneurysms. *BMJ*, 1992;305:1013. (24 October.)

Adolescent medicine

EDITOR,—Michael Malus highlights several areas of potential ill health among the teenage population in the United Kingdom.¹ His main premise is that improvements in teenage health depend on information and research findings that should be performed by a new form of secondary care specialist in adolescent medicine. He cites the success of the North American experience as being a good reason for promoting this new specialty elsewhere.

His review is based on mortality and morbidity statistics and the fact that they are at best unchanged and at worst have deteriorated over the past 10 or 20 years. This period has coincided with the emergence of the new specialty of adolescent medicine in North America. These data hardly support the concept of a successful introduction for the new specialty, and the one reference provided for a successful American programme describes teamwork rather than a specialty.

The medicine that Malus advocates is not holistic and does not seem to have considered the role of the family, education, or social services departments in the care of teenagers. Social needs may not always be the predominant factor of teenagers' care, but this group cannot be understood if isolated from their social context.

An adolescent medicine specialist with a significant service role would be faced with the difficulty of appropriate handover of care to other specialists. This is already the case with such illness as cystic fibrosis and renal disease in which the paediatrician may well care for the patient beyond the age of 16. However, more difficulties would ensue if the paediatrician were to hand over to the adolescent medicine specialist, who in turn would hand over to the adult physician. The general practitioner would probably be left trying to provide continuing care in the midst of poor communication with the secondary care providers.

American experience suggests that some teenagers may prefer some aspects of their health care to be provided away from their usual family or community clinics. It is unclear if this is the case in Britain. Research data from the Health Education Authority suggest that teenagers are uncomfortable in primary care consultations,² but this does not suggest that hospital doctors perform any better. Data from the United States and New Zealand suggest much criticism of health care professionals in the secondary sector,^{3,4} albeit in different specialties from that of Malus. Donovan has reported that a teenage health clinic carried out in his north London practice met with approval from the teenagers in the practice.⁵

Malus focuses on negative aspects of teenage care and assumes that drug use, teenage pregnancy, and use of alcohol and cigarettes is what teenagers would not do if they were merely better informed. The experience of health educators suggests that the solutions are not so simple. We know very little about teenagers' concepts of health and illness and the priorities they accord to health and lifestyle issues.

We agree with Malus that research into teenage health is an important area for investigation that should be encouraged. However, the creation of yet another specialty in the fragmenting secondary care sector will not necessarily help in the conduct of research which will inform "good practice" in

paediatrics, psychiatry, general medicine, accident and emergency medicine, and general practice.

L JACOBSON C WILKINSON
N CH STOTT P OWEN
R PILL

Department of General Practice,
University of Wales College of Medicine,
Cardiff CF3 7PN

- 1 Malus M. Towards a separate adolescent medicine. *BMJ* 1992; 305:789-90. (3 October.)
- 2 Bolding J. *Young people in 1987*. Exeter: HEA Schools Health Education Unit, University of Exeter, 1988.
- 3 Resnick M. *Health concerns of youth—multiple perspectives*. London: Academic Press, 1982.
- 4 Morris E. *Looking after yourself—some views from 15 to 19 year olds on health and illness*. Wellington, New Zealand: Department of Health, 1985:95-6. (Special Report Series 73.)
- 5 Donovan CF. Is there a place for adolescent screening in general practice? *Health Trends* 1988;20:64.

EDITOR,—Michael Malus's editorial arguing for a separate specialty of adolescent medicine focuses largely on the behavioural, psychological, and psychiatric aspects of adolescence.¹ These aspects of health care need often require skilled and sophisticated interventions if behavioural change is to occur. In the United Kingdom these are already offered by child and adolescent psychiatrists. The Health Advisory Services's report *Bridges Over Troubled Waters* in 1986 highlighted the need for further development of adolescent psychiatry.² Most of its recommendations have not been implemented and remain equally relevant in 1992.

Since the advent of the internal market in the NHS concerns have been expressed about psychiatric services for young people. The president of the Royal College of Psychiatrists has written to those chairing regional health authorities specifically about the continued need for psychiatric inpatient units for adolescents.³

Purchasing authorities need to be aware of the distinctive mental health needs of adolescents as this section of the population has few prominent or powerful advocates and pressure groups. They should seek to place contracts that encourage provider units specifically to address the needs of this neglected group. This will mean being clear about the skills possessed by physicians and those possessed by psychiatrists.

ANDREW CLARK
DAVID ROTHERY

Irwin Unit for Young People
(West Midlands Regional Adolescent Unit),
Hollymoor Hospital,
Birmingham B31 5EX

- 1 Malus M. Towards a separate adolescent medicine. *BMJ* 1992; 305:789-90. (3 October.)
- 2 NHS Health Advisory Service. *Bridges over troubled waters*. London: HMSO, 1986.
- 3 Sims ACP. *Psychiatric in-patient units for adolescents*. London: Royal College of Psychiatrists, 1992.

EDITOR,—Michael Malus proposes that there should be a specialty of adolescent medicine in Britain.¹ The transition from childhood to adulthood has increasingly become the focus of interest among clinical, educational, and social science professionals. Four key interrelated objectives of transition were identified by the Centre for Educational Research and Innovation²: a sense of identity and personal autonomy, taking full responsibility for one's own life; productive activity or employment with a view to self sufficiency (a goal perhaps to be modified in the present economic climate³); adult status in society and law, social interaction, and participation in the community; and adult relationships and roles within the family, establishing a partnership, and looking forward to parenthood.

Accomplishing these developmental tasks is seldom smooth; for young people with disabilities

"[the transition from school to adult life] is likely to be a period of particular stress."⁴ Yet these people have the same aspirations as their able bodied contemporaries, and most have a full life expectancy. We believe that specific transition services offer a way of helping these young people attain their full potential.

In Leeds our experience endorses a multi-disciplinary, multisectoral team approach focusing on the special needs of these young people. The work of our young adult team has recently been evaluated in a study funded by the Nuffield Provincial Hospitals Trust (in preparation), and we are writing a short handbook as guidance for those planning to set up services.

Under the Disabled Persons (Services Consultation and Representation) Act 1986, responsibility for physically handicapped school leavers rests with the local authority. But the health authority has a major role in identification and assessment and in providing health care and aids for daily living, as well as fostering self esteem and growth towards a fulfilled adult life.

MANNE CHAMBERLAIN
SALLY GUTHRIE

Rheumatology and Rehabilitation Research Unit,
School of Medicine,
University of Leeds,
Leeds LS2 9NZ

- 1 Malus M. Towards a separate adolescent medicine. *BMJ* 1992;305:789-90. (3 October.)
- 2 Fish J. *Young people and handicaps: the road to adulthood*. Paris: Organisation for Economic Cooperation and Development/ Centre for Educational Research and Innovation, 1986.
- 3 Jenkins R. Dimensions of adulthood in Britain: longterm unemployment. In: Spencer P, ed. *Anthropology and the riddle of the sphinx*. London: Routledge, 1990. (ASA monograph 28.)
- 4 Department of Education and Science. *Special educational needs*. London: HMSO, 1978. (Warnock report.)

Domiciliary thrombolysis by general practitioners

EDITOR,—The clinical criteria for entry to the Grampian region early anistreplase trial¹ were similar to those of previous trials in which electrocardiographic confirmation of the diagnosis was not required,^{2,3} and the diagnostic criteria were the same as those in the Anglo-Scandinavian study of early thrombolysis.³ The diagnostic accuracy of general practitioners and hospital doctors in the Anglo-Scandinavian study may therefore be compared directly.

The percentages of patients with a final diagnosis of any myocardial infarction were 72% in hospital and 78% in general practice, while for definite and probable myocardial infarction the figures were 66% and 61% respectively. This indicates similar clinical prowess even though junior hospital doctors take these clinical decisions every day while general practitioners averaged only about one trial entry a year. We agree that some patients with unstable angina were probably included under "ischaemic heart disease" or "possible myocardial infarction," but the explanation that John E Sanderson gives for the lower proportion of Q wave infarcts in the "home" group⁴ is incorrect: hospital staff were required to cite "hospital injection" unless they could find an alternative diagnosis to suspected myocardial infarction; this happened on only three occasions.

In the trial thrombolytic treatment was given strictly according to an agreed protocol and was not given inappropriately; it is the purpose of clinical trials to show what is appropriate clinical practice. We wished to test the hypothesis that very early thrombolytic treatment might abort infarction, which would be likely only in patients who had not yet developed diagnostic abnormalities on electrocardiography. That hypothesis was not confirmed, and the trial should certainly not be seen as a recommendation to give thrombolytic

Mortality in patients given thrombolytic treatment at home or in hospital

treatment without electrocardiographic confirmation of the diagnosis.

In Stuart J Pocock and David J Spiegelhalter's interpretation of our mortality data¹ the estimate of the prior probability of a reduction in mortality by giving treatment two hours earlier is derived from trials in which thrombolytic treatment was given in hospital at the first opportunity. But the relation between outcome and time of administration of the treatment is not a true reflection of its efficacy at different times. The outcome will be biased against indicating greater efficacy with earlier administration because of the greater severity of infarction in patients presenting earlier.² Only in a trial with a design such as ours, in which patients are randomly allocated to receive treatment immediately on presentation or after a delay, can the importance of delay be determined. We acknowledge that three month mortality was not a predetermined end point and, indeed, that ours was not a mortality end point trial, but we would have been remiss not to draw attention to the mortality we found (figure).

Though agreeing that we were lucky in our result, we do not agree that a 50% reduction in mortality can be dismissed as implausible: a reduction of similar magnitude was found in the European myocardial infarction project in patients in whom the saving in time to treatment was over 90 minutes (A Leizorowicz, personal communication).

JOHN RAWLES

Medicines Assessment Research Unit,
University of Aberdeen,
Medical School,
Aberdeen AB9 2ZD

- 1 GREAT Group. Feasibility, safety, and efficacy of domiciliary thrombolysis by general practitioners: Grampian region early anistreplase trial. *BMJ* 1992;305:548-53. (5 September.)
- 2 Second International Study of Infarct Survival Collaborative Group. Randomised trial of intravenous streptokinase, oral aspirin, both, or neither among 17 187 cases of suspected acute myocardial infarction: ISIS-2. *Lancet* 1988;ii:349-60.
- 3 Wilcox RG, von der Lippe G, Olsson CG, Jensen G, Skene AM, Hampton JR. Trial of tissue plasminogen activator for mortality reduction in acute myocardial infarction. Anglo-Scandinavian study of early thrombolysis (ASSET). *Lancet* 1988;ii:525-30.
- 4 Sanderson JE. Domiciliary thrombolysis by general practitioners. *BMJ* 1992;305:1014. (24 October.)
- 5 Pocock SJ, Spiegelhalter DJ. Domiciliary thrombolysis by general practitioners. *BMJ* 1992;305:1015. (24 October.)
- 6 Rawles JM, Mercalfe MJ, Shirreffs C, Jennings K, Kenmore ACF. Association of patient delay with symptoms, cardiac enzymes, and outcome in acute myocardial infarction. *Eur Heart J* 1990;11:643-8.

EDITOR,—As general practitioners who contributed to the Grampian region early anistreplase trial¹ we are disappointed that correspondents' response to the trial has been so negative.²

A C H Pell and K A A Fox say that delay can be reduced by using an ambulance summoned by a 999 call and a hospital "fast track" system. We

suspect that if this system was adopted their fast track system would soon be overwhelmed by the huge number of patients with musculoskeletal and spurious chest pain who are currently screened out by general practitioners. The hypothesis that this would be a better way of giving coronary care is, in their own words, untested. Care of patients with acute myocardial infarction entails not only resuscitation and thrombolysis but also relief of pain, management of cardiac failure, and treatment of arrhythmias. It is unthinkable that patients should be encouraged to bypass their general practitioner and so have these problems left untreated before making a journey by ambulance. This system would be even less applicable to patients living outside cities.

The Grampian trial was a well planned and conducted, classically designed double blind placebo controlled trial. Further studies of this type are not likely to be done and are not needed. Early coronary care by general practitioners, including thrombolytic treatment, has been shown to be highly effective. Will general practice now rise to the challenge, and will our cardiological colleagues give us the support we need?

R W LIDDELL

Health Centre,
Turneff,
Aberdeenshire

S ROBERTSON

Health Centre,
Fyvie AB53 8QD

A G SINCLAIR

Jubilee Hospital,
Huntly AB54 5EX

G GORDON

Medical Centre,
Fraserburgh

- 1 GREAT Group. Feasibility, safety, and efficacy of domiciliary thrombolysis by general practitioners: Grampian region early anistreplase trial. *BMJ* 1992;305:548-53. (5 September.)
- 2 Correspondence. Domiciliary thrombolysis by general practitioners. *BMJ* 1992;305:1014-5. (24 October.)

EDITOR,—We recently completed a feasibility study of a system to reduce delays to patients receiving thrombolysis that may be considered complementary to the GREAT Group's study.¹ Ambulance crews were trained to assess patients by clinical questionnaire and by recording pulse and blood pressure. Electrocardiograms were recorded by computer assisted analyser and transmitted to the coronary care unit by cellular telephone. After discussion with nursing staff in the unit the ambulance staff took patients with a high likelihood of acute myocardial infarction directly to the unit.

Forty nine consecutive patients with chest pain were assessed and transported to hospital. Eight patients did not have an electrocardiogram recorded (because they did not consent or were not in pain); for these patients the mean time from the ambulance's arrival at the scene to departure was 6.25 minutes. For the 41 patients who had electrocardiograms recorded the mean time from the ambulance's arrival at the scene to departure was 18.75 minutes. Eleven of the 49 patients had an acute myocardial infarction confirmed by enzyme values.

Ambulance crews were required to liaise with the coronary care unit's nursing staff by means of the telephone link. Among the 11 patients subsequently confirmed to have had an acute myocardial infarction the nursing staff assessed the electrocardiogram transmitted as confirming acute myocardial infarction in five patients, equivocal or not indicating acute myocardial infarction in three, and failure of transmission in one; one patient refused electrocardiography. One patient with an inferior myocardial infarction was incorrectly assessed as not having infarction. The medical staff diagnosed a high likelihood of acute myocardial infarction in six patients, who were considered for

thrombolysis. One further patient was given thrombolysis; enzyme values did not rise importantly, the system identified five of the patients with acute myocardial infarction, who were redirected to the coronary care unit despite an open access system for general practitioner referrals. For these patients the reported in hospital assessment and transfer delays were thus avoided.^{2,3}

Our study shows that ambulance crews can reliably assess patients presenting with chest pain and record a 12 lead electrocardiogram. In liaison with the coronary care unit's nursing staff they reliably identified patients with a high likelihood of acute myocardial infarction. Thus the system may be of value in supporting the administration of thrombolysis in the community by general practitioners and in reducing delays by promoting direct admission to the coronary care unit for both self referrals and general practitioner referrals.

In our catchment area there are 140 general practitioners who would require access to a defibrillator and electrocardiographic equipment. There are only two frontline responding ambulances, and thus only three electrocardiographic units, including the coronary care unit's base unit, and cellular telephone units need to be provided. All frontline ambulances in Scotland have defibrillators.

PETER H SEIDELIN

Department of Medical Cardiology,
Royal Infirmary,
Glasgow G31 2ER

BARRY D VALLANCE

Department of Medical Cardiology,
Hairmyres Hospital,
East Kilbride

- 1 GREAT Group. Feasibility, safety, and efficacy of domiciliary thrombolysis by general practitioners: Grampian region early anistreplase trial. *BMJ* 1992;305:548-53. (5 September.)
- 2 Pell ACH, Miller HC, Robertson CE, Fox KAA. Effect of "fast track" admission for acute myocardial infarction on delay to thrombolysis. *BMJ* 1992;304:83-7.
- 3 Birkhead JS. Time delays in provision of thrombolytic treatment in six district hospitals. *BMJ* 1992;305:445-8. (22 August.)

Thrombolytic treatment for elderly patients

EDITOR,—As Andrew T Elder and Keith A A Fox point out,¹ elderly patients suffering from acute myocardial infarction are often treated differently from younger patients and sometimes are not given thrombolytic treatment for reasons that are not clearly justifiable.

J S Birkhead collected data only on patients admitted to coronary care units and does not give any information about their ages.² Studies in Britain have suggested that a fifth of these units set an upper age limit for admission.³ A recent survey of attitudes to the management of acute myocardial infarction in Wales found that no hospitals admitted to having a formal age related policy governing admissions to the coronary care unit or use of thrombolysis. Despite this, a significant association between younger age (<70) and admission to a coronary care unit (17/20 (85%) v 14/29 (48%), $p=0.02$) and use of thrombolytic treatment (17/20 (85%) v 15/29 (52%), $p=0.01$) was found (S Arino for Senior Registrar Geriatric Study Group, British Geriatric Society's spring meeting, Swansea, April 1992).

An audit of 251 consecutive elderly patients admitted to two teaching hospitals in Cardiff found that of 223 patients able to give information, 126 were admitted to hospital within 12 hours (median 185 minutes). The "decision time" was 90 minutes. This interval was considerably influenced by the patients' interpretation of the likely cause of their symptoms. Similarly, the time taken for a general practitioner to respond to a call was much shorter if the patient had a history of ischaemic heart disease. Other factors had no great influence. Ambulances