driven by their evangelical belief that the ills of renal bone disease are best treated by calcium and the avoidance of derivatives of vitamin D.² It is unfortunate that their conclusions are based on their experience—a notorious arbiter of efficacy—rather than on double blind and randomised controlled studies, but they raise some important points.

The transient suppression of hyperparathyroidism with alfacalcidol and the subsequent escape are well described, not only with derivatives of vitamin D but also with cholecalciferol and with calcium whether given in the form of supplements to the diet or supplements to the dialysis fluid.³ As mentioned, the regimen that we used did not adversely affect serum phosphate concentration. This suggests that factors other than hyperphosphataemia, vitamin D metabolites, and extracellular calcium concentrations are important components of the pathogenesis of hyperparathyroidism. Higher doses of alfacalcidol than we gave may possibly have more complete or long lasting effects. The view that alternative treatment regimens would provide more complete effects is a hypothesis that is not yet proved.

Fournier and colleagues also raise the question of whether our patients had a dietary deficiency of vitamin D. Bone histology is the ultimate arbiter of osteomalacia, which was rarely found on biopsy before treatment: only one patient had osteomalacia in the absence of osteitis fibrosa on histological examination of bone. Dietary intakes of calcium and vitamin D (which were measured but not given in our paper) were well above the recommended daily allowance, and the average dietary intake of calcium exceeded 800 mg daily. If data from all patients with prevalent osteomalacia are excluded the same results were observed.

In response to other questions, reference ranges for bone cell counts vary according to the laboratory. Our own are provided elsewhere.⁴ The optimum range of parathyroid hormone concentrations in early renal failure is provided by the reference ranges. We speculate that the same range will operate, irrespective of the degree of renal failure.

JOHN A KANIS
Professor

NAVEEN A T HAMDY
Clinical research fellow

WHO Collaborative Centre for Metabolic Bone Diseases,
Department of Human Metabolism and Clinical Biochemistry,
University of Sheffield Medical School,
Sheffield S10 2RX

IAN T FAIREY
Clinical data manager

Leo Laboratories,
Princes Risborough HP27 9RR

- 1 Kanis JA, Adams ND, Earnshaw M, Heynen G, Ledingham JGG, Oliver DO, *et al*. Vitamin D, osteomalacia and chronic renal failure. In: Norman AW, Schaeffer K, Coburn JW, DeLuca HF, Fraser D, *et al*, eds. *Vitamin D: biochemical, chemical and clinical aspects related to calcium metabolism*. Berlin: DeGruyter, 1977:671-3.
- 2 Fournier A, Druke T, Moriniere PH, Zingraff J, Boudailliez B, Achard JM. The new treatments of hyperparathyroidism secondary to renal insufficiency. In: Grünfeld JP, ed. *Advances in nephrology*. Vol 21. St Louis: Mosby Year Book, 1992: 237-306.
- 3 Cundy T, Hamdy NAT, Grey R, Jackson B, Kanis JA. Hyperparathyroid bone disease in chronic renal failure. *Ulster Med J* 1985;54:S34-43.
- 4 Taube T, Beneton MNC, Williams JL, McCloskey EV, Kanis JA. Distinction between focally accelerated bone formation and osteomalacia in carcinoma of the prostate metastasised to bone. *Br J Urol* 1993;72:98-103.

Psychosis due to "skunk"

EDITOR,—Recently we have become aware that drug misusers are using a variety of cannabis known as skunk. Some users have described a considerable psychotic experience after use of relatively small quantities.

In November 1994 we surveyed 50 drug misusers attending the methadone programme of the

Glasgow drug problem service, asking them about their reported use and experiences of skunk. Eight reported having used skunk, of whom four reported having experienced psychotic symptoms after its use. Three of those who described psychotic experiences agreed to further assessment. All three admitted to regular misuse of cannabis in addition to their prescribed methadone (with one admitting to occasional misuse of benzodiazepines) and so were experienced in the effects of cannabis. All denied concomitant use of other hallucinogens, and none described any important psychiatric history.

All three described psychotic experiences after smoking one "regular sized joint." These consisted of paranoid delusions and visual illusions in all three cases, visual and auditory hallucinations in two cases, and pronounced derealisation and depersonalisation together with thought broadcast in one case. Two users described associated severe anxiety. The experience lasted for a variable period (half an hour, one day, and three days).

All three subjects believed that the skunk that resulted in the psychotic experience originated from the Netherlands rather than Britain.

Skunk is derived from a variety of cannabis plants that have been selectively cross bred to produce high yielding varieties. While the tetrahydrocannabinol content of "normal" cannabis is up to about 5% by weight, skunk may yield 10-15%, with an even higher content being reported from the Netherlands.

Doctors should be aware of the increasing availability of varieties of cannabis yielding a high content of tetrahydrocannabinol and that psychotic episodes may be precipitated by consumption of what would previously have been considered to be relatively small quantities.

A S WYLIE
Senior registrar in general psychiatry
and substance misuse

Gartnavel General Hospital,
Glasgow G12 0YN

R T A SCOTT
Medical director
S J BURNETT
Research officer

Glasgow Drug Problem Service,
Ruchill Hospital,
Glasgow G20 9NB

Rationing is not inevitable

EDITOR,—In the debate about rationing, rationing is often assumed to be inevitable.¹ But is it? As Rawles has pointed out: "The ethical problem of how to apportion limited resources amongst the needy has been forced on us by arbitrary limitation of health care expenditure. Its solution would not be required if health expenditure were higher."²

Those who support rationing often say that resources are finite but demands are infinite. Yet this cliché does not bear examination. It is a version of Malthus's discredited argument that populations would always outrun resources. It would be closer to the truth to argue that resources are infinite while demands are finite. Any sensible definition of the resources involved in health care, as in other human activities, must include the skills, education, and professionalism of those working in the sector. There is no limit to these.

Nor are demands infinite. Firstly, any human life is finite, so demands can be only finite. Secondly, there is not an infinite demand for any particular treatment—for instance, there is not an infinite demand for kidney transplants but a need for about 60 per million population. Even if we all needed a kidney transplant this would not equal infinite demand.

Government ministers all too often tell us that we must cut our coat according to our cloth. Yet they are figuratively closing down the textile industry that produces that cloth. Our NHS is

built on the effort to match resources to needs. It is not our job to cut needs down to match limited resources. Rationing, as Callahan rightly said, is "the deliberate withholding of beneficial medical care."³ It is contrary to the NHS's purpose.

WILL PODMORE
Chief librarian

British School of Osteopathy
London E8 3EE

- 1 Bion JF. Rationing intensive care. *BMJ* 1995;310:682-3. (18 March.)
- 2 Rawles J. Castigating QALYs. *J Med Ethics* 1989;15:143-7.
- 3 Callahan D. Rationing medical progress. The way to affordable health care. *N Engl J Med* 1990;322:1811.

Education and prevalence of Alzheimer's disease and vascular dementia

Premorbid ability influences measures used to identify dementia

EDITOR,—Alewijn Ott and colleagues identified 474 cases of dementia in a suburb of Rotterdam and report that the prevalence of Alzheimer's disease is inversely related to educational status.¹ In an accompanying editorial Martin Orrell and Barbara Sahakian conclude that there may be some truth in the age old saying "use it or lose it" regarding mental skills.² In Ott and colleagues' study dementia was primarily diagnosed on the basis of poor performance in tests of cognitive efficiency. The first screen consisted of a geriatric mental status examination and the mini mental states examination. Subjects who were positive on screening were then assessed with the Cambridge examination for mental disorders of the elderly diagnostic interview; those scoring below the recommended cut off on the cognitive subscale were selected for brain scanning and neurological evaluation. In essence, a major determinant of the identification of cases and diagnosis was poor performance in the minimal state examination and on the cognitive subscale of the diagnostic interview. The authors then report that a greater proportion of subjects with low educational attainment fulfilled diagnostic criteria for Alzheimer's disease. They do not think that diagnostic bias influenced their findings.

We wish to add a cautionary note before the relation between education and Alzheimer's prevalence becomes an established fact. Educational attainment correlates to a greater or lesser extent with virtually every cognitive test through the shared variance of general ability and intelligence. To put it simply, some people may perform relatively poorly in tests such as the cognitive subscale of the diagnostic interview not because they have an insidious dementing condition but because they were never particularly intelligent to begin with. Such people often have a limited educational background.

We put this hypothesis to the test in 51 healthy elderly subjects who were cognitively intact (mean age 74.1 (SD 18.2) years; mean total score on the cognitive subscale 95.9 (5.3)). Following Ott and colleagues' method, we classified our group by degree of educational attainment, in our case years of full time education (≤ 10 years, 11-12 years, ≥ 13 years). Analysis of variance of the total scores on the cognitive subscale showed a highly significant effect (≤ 10 years ($n=19$), score=92.2 (6.2); 11-12 years ($n=15$), score=97.4 (4.8); ≥ 13 years ($n=18$), score=98.7 (3.2); $f=8.76$, $P=0.0006$). Scheffé posthoc comparison showed that the group with fewest years of full time education performed significantly worse in terms of the total score than the two other groups. The simple correlation between years of full time education and the total score for the entire healthy, non-cognitively impaired sample was $r=0.48$, $P<0.001$.

The confounding effect of educational background and general premorbid ability must always be considered when predictors of dementia are sought, particularly when performance on the measures used to identify dementia is highly influenced by premorbid ability.

RONAN O'CARROLL
Clinical psychologist
KLAUS EBMEIER
Consultant psychiatrist

MRC Brain Metabolism Unit,
Royal Edinburgh Hospital,
Edinburgh EH10 5HF

- 1 Ott A, Breteler MMB, van Harskamp F, Claus JJ, van der Cammen TJM, Grobbee DE, *et al.* Prevalence of Alzheimer's disease and vascular dementia: association with education. The Rotterdam study. *BMJ* 1995;310:970-3. (15 April.)
- 2 Orrell M, Sahakian B. Education and dementia. *BMJ* 1995;310:951-2. (15 April.)

A study of patients living in institutes may bias the findings

EDITOR,—Alewijn Ott and colleagues report their estimates of the prevalence of dementia in a suburb of Rotterdam and state that the fact that 27% of the potential population was unscreened was likely to lead to an underestimate of the rates.¹ This fails, however, to account for the bias of living in an institution.

Altogether 8% of the total population, a high rate for the cut off age of 55, was living in an institution, but all those in institutions were included in the authors' screened sample—a rate of 12%. Since the authors state that many of the subjects with dementia were living in an institution the true prevalence is likely to be lower than their estimate. Unfortunately, they detail neither the number in institutions considered to be demented nor the quality of the diagnostic work up that this sizeable subgroup had. It is also unclear whether this part of Rotterdam is typical in terms of the number of residential homes per capita. Perhaps better educated people with dementia are more able to avoid admission to an institution in the Netherlands and fall into the unevaluated 23%, while those with lower educational attainment end up in institutions.

JOHN M STARR
Senior registrar in geriatric medicine

Hammersmith Hospital,
London W12 0HS

- 1 Ott A, Breteler MMB, van Harskamp F, Clams JJ, van der Cammen TJM, Grobbee DE, *et al.* Prevalence of Alzheimer's disease and vascular dementia: association with education. The Rotterdam study. *BMJ* 1995;310:970-3. (15 April.)

Author's reply

EDITOR,—Ronan O'Carroll and Klaus Ebmeier suggest the possibility of diagnostic misclassification. I agree that the diagnosis of dementia cannot be based on the cognitive test we used. As discussed in our paper, after the screening test, which comprised the minimal state examination and the geriatric mental state schedule (organic level) followed by the Cambridge examination for mental disorders of the elderly, we used an extensive clinical neurological evaluation to diagnose dementia. We do not think it likely that misclassification resulted in our overdiagnosing dementia in those with low general cognitive ability. They were positive on screening and were extensively evaluated clinically. It is possible, however, that we missed some early cases in which the subjects had a high premorbid cognitive function and managed to escape the sensitive screening. Our present follow up study of the incidence of dementia may show the extent of underdiagnosis of intelligent early demented patients and thus give a more accurate measure of the association with education.

John M Starr questions whether our estimates of

prevalence can be generalised. We think that our age specific prevalences, unlike the overall prevalence, can validly be extrapolated to the general population. The overall prevalence depends on the age distribution and the proportions living in institutions. The prevalence of dementia is generally higher in institutions. In the Rotterdam study 11.2% lived in institutions (homes for elderly people); in the substudy of dementia the figure was 11.9%, which is higher than the figure in the general Dutch population. The reason is that the population in the Rotterdam study was older than the Dutch population aged 55 and over: 35% were 55-64 years old, 34% were 65-74, and 31% were ≥ 75 , compared with 43%, 33%, and 24% respectively. Also, a higher percentage of elderly people in urban than rural areas live in institutions. The age specific proportion living in institutions in our study, however, was reasonably similar to that in the general Dutch population.

For those who are interested, I am happy to supply estimates of prevalence broken down by age and proportion living in institutions.

ALEWIJN OTT
Research physician

Erasmus University Medical School,
Rotterdam,
Netherlands

Promoting cost effective prescribing

Cost effectiveness studies may not be cost effective

EDITOR,—Nick Freemantle and colleagues criticise the NHS for lagging behind Australia and Canada in promoting cost effective prescribing.¹ As members of the working group that agreed the British guidance on conducting economic evaluations² we take issue with their claim that these countries have a preferable approach.

There is no evidence that Australia and Canada have more cost effective prescribing than the United Kingdom. They have centralised reimbursement lists (federal and provincial, respectively), requiring the submission of information on cost effectiveness. Such submissions should improve decision making, but costs are attached to the process. Neither country has evaluated how cost effective these procedures are.

The United Kingdom does not have a central reimbursement list. General practitioners have budgetary responsibility to encourage them to match the cost of prescribing with expected health gain. Increases in generic prescribing, reviews of repeat prescriptions, and a greater willingness not to prescribe have all increased the cost effectiveness of prescribing.³ Information on the cost effectiveness of prescribing in the United Kingdom therefore needs to be targeted at general practitioners and other decision makers. The British guidance is designed primarily for those preparing studies that will be used to convey such information to general practitioners. Provision of this information by the pharmaceutical industry is governed by the same standards as is provision of clinical information—that is, the code of practice of the Association of the British Pharmaceutical Industry, administered by the Prescription Medicines Code of Practice Authority; the authority exists to ensure that standards are high.

Freemantle and colleagues are right to say that more should be done to promote the use of studies of cost effectiveness (for all technologies) in the NHS but wrong to believe that this requires promotion of the guidance. It requires decision makers to believe that such information is relevant. In the case of medicines, competition will ensure that it is supplied.

There is no simple formula to ensure cost effective prescribing. In Australia and Canada the

assumption is that decisions are taken by "experts" rather than prescribing general practitioners. In the United Kingdom the general practitioners decide, drawing on expert advice. How should we assess which system is the most effective? Certainly not by anecdote and assertion. We need evidence of the relative effectiveness of these regimes.

ADRIAN TOWSE
Director

Office of Health Economics,
London SW1A 2DY

NICHOLAS WELLS
Head of Health Economics

Glaxo Pharmaceuticals UK,
Uxbridge,
Middlesex UB11 1BT

- 1 Freemantle N, Henry D, Maynard A, Torrance G. Promoting cost effective prescribing. *BMJ* 1995;310:955-6. (15 April.)
- 2 Department of Health. *Virginia Bottomley welcomes pioneering guidelines for the economic evaluation of medicines*. London: DoH, 1994. (Press release 94/251.)
- 3 Audit Commission. *A prescription for improvement: towards more rational prescribing in general practice*. London: HMSO, 1994.

More trials from general practice are needed

EDITOR,—As the medical prescribing adviser to Highland Health Board, I have a responsibility to encourage cost effective prescribing. Nick Freemantle and colleagues rightly emphasise the need for adequate data from good trials, but they miss one major point. Much of the 85% of prescribing that takes place in general practice is necessarily based on a presumptive diagnosis (for example, heartburn) rather than proved disease (for example, reflux oesophagitis)—but drug trials are generally limited to selected groups of patients with proved disease (for example, endoscopically proved oesophagitis). Thus, while a proton pump inhibitor may be shown to be the most cost effective treatment for endoscopically proved erosive oesophagitis, this does not necessarily mean that it is the best treatment for patients with dyspepsia presenting to general practitioners.

The prescription of proton pump inhibitors has increased by about 160% over the past two years in Scotland, and these drugs alone account for 25% of the increase in the total drug budget over that period. It seems unlikely that this reflects a real increase in the incidence of the diseases for which these drugs were evaluated: endoscopically proved oesophagitis or peptic ulceration.

The different worlds of wizards (consultants) and gatekeepers (general practitioners) have been eloquently described.² The wizard's magic potions and crystal balls, however well proved in selected patients, may not always be as cost effective when applied to the gatekeeper's clientele. If we are serious about promoting cost effective prescribing, we either need more studies of prescribing options in a primary care setting (where most patients present with symptoms) or need to pay more attention to the translation of clinical trials from highly selected groups of patients to the majority of clinical (that is, general) practice.

DENNIS M TRACEY
Consultant in public health medicine

Highland Health Board,
Inverness IV2 3HG

- 1 Freemantle N, Henry D, Maynard A, Torrance G. Promoting cost effective prescribing. *BMJ* 1995;310:955-6. (15 April.)
- 2 Mathers N, Hodgkin P. The gatekeeper and the wizard: a fairy tale. *BMJ* 1989;298:172-4.

Cost effectiveness rapidly becomes cost containment

EDITOR,—We believe that Nick Freemantle and colleagues' editorial on promoting cost effective prescribing may give an unrepresentative perception of Australian experience.¹ The policy of requiring economic analysis before being prepared