through a course that maintains a high academic standard, covers a large range of subjects, and rigorously tests stamina and persistence over a long time. This all requires personal characteristics of resilience, adaptation, perseverance, and emotional stability in the face of real hard work and sometimes tribulation. Such tried and tested people are capable of doing almost anything they wish to, provided that their will and motivation are sufficiently strong.

It may be said with some truth that those who fail in doing what they wish to in medicine show only that they have lacked the strength of purpose, so that they have not "scorned delights and lived laborious days." In short, they have not desired their imagined goal with sufficient intensity that they were willing to sacrifice themselves to it. This does not matter. There are many philosophies as to how life should be lived, and it is impossible to generalise and say that only one philosophy is right for everyone. If you want badly enough to be a brain surgeon then you probably can be if you will drive yourself, eschewing many

other things that other people of your acquaintance may think pleasurable and desirable. Only you can decide how much the desired end justifies the means.

If you know what you want to do and put in the effort to achieve it then almost nothing will stop you. But when you are not so sure you must weigh the chances more carefully—trying to assess your academic intelligence, your personal characteristics, and your disparate goals in life. If you take on all the opposition you might fail to get what you want. If you pick the opposition with some care to see that it is not too great then your chances of your particular variety of success may be the greater.

Your aim will be to become either a consultant or a principal in general practice, for these are the only two career grades in the National Health Service. There may be a few other aims, which I will discuss in later articles, but numerically they are relatively so few that the general statement is essentially true. So I shall consider these two careers separately in the next few articles.

Essentials of Health Economics

Part IV—Organising health care resources

G H MOONEY, M F DRUMMOND

In part III of the series¹ we outlined the contribution of economists to policy planning. In this article we examine their input to the organising and planning of resources in health care. For example, economists have played a major role in the drafting of the recently issued guidance from the Department of Health and Social Security to health authorities on how to mount economic appraisals of capital schemes.² In fact they have been instrumental in gaining acceptance for the need for such appraisal.

The essence of the economist's role not only in an appraisal of such options but in health care policy more generally is illustrated as follows: "The approach advocated in this guide is not a rigorous form of cost-benefit analysis in which all the advantages and disadvantages are reduced for comparison to money terms. Nevertheless the framework proposed should enable the merits of alternative courses of action to be systematically compared and to be quantified wherever possible to reduce the degree of subjectivity involved. Inevitably there will be some factors which can only be assessed in a subjective manner but the framework enables these judgments and their implications to be made explicit."²

Creating a framework for appraising choices

The systematic framework is again important. Economics can only be decision aiding and not decision making, since health care planning and policy making are inevitably subjective. Being aware of that and making the necessary trade-offs explicitly and hence more rationally is the function of economics. Thus, in the context of appraising capital schemes a framework needs to be created which will allow the costs and benefits of different schemes (in whatever form) to be assessed. Indeed, one of the central yet simple themes of economics is that the range of choice is frequently much wider than may be apparent at first glance. Thus an acknowledged shortage of acute beds (and that already means a choice has been made) in a particular area might require choices concerning: (a) new, upgraded, or redesignated beds; (b) total number and numbers by specialty required; (c) location (within or outwith the area and, if the former, choice of precise site); (d) timing (when to build); (e) speed of completion (rate of development); and (f) how to cope with uncertainty (owing perhaps to possible demographic changes). Even if none of these dimensions of choice is present there is always the "do nothing" option. Thus one of the most fundamental yet simplest messages of appraisal is: Hobson was not an economist and Hobson's choices are very infrequent phenomena in the world of economics.

Manpower planning

Appraising the options in capital schemes is at an early stage of development, as is the planning of the main health service resource, manpower. Given the importance of both medical and nursing manpower it is disturbing how little has been done on this front, particularly with nursing.

Health Economics Research Unit, Department of Community Medicine, University of Aberdeen, Aberdeen AB9 2ZD

G H MOONEY, MA, director of health economics research unit and senior lecturer in health economics

Health Services Management Centre, University of Birmingham, Birmingham B15 2RT

M F DRUMMOND, BSC, MCOM, lecturer in economics

DOCTORS

The Royal Commission on medical manpower reported, "We found [the question of how many doctors the community should be training] was an extremely complex matter." Yet without any apparent detailed analysis the authors were able to conclude that "it would be a mistake to cut back the planned output of medical graduates from UK institutions." Not all would agree, but the important matter in all this is the need for a greater understanding of the issues in manpower planning.

Economic theory is straightforward on this issue as Maynard and Walker⁴ have indicated: "Imbalances in the labour market arise because of rigidities that restrict the price (wage) and quantity adjustments." They can, however, be sorted out simply. "For instance, a shortage of a particular skill will lead to bidding by competing employers so that the real wage or salary rate will tend to be increased. In the short run, when the supply of labour is fixed, the higher real wage will equate demand and supply by rationing demand. In the longer term the higher level of remuneration will generate additional supplies of the labour that is in short supply."⁴ Because of the nature of the market for doctors, particularly in the UK, it is not surprising that problems arise with this adjustment process. For example, we are a long way from a competitive market situation. The National Health Service is virtually the sole buyer of doctors' services and because of the timescale of medical training there can be lengthy delays in adjusting the numbers of doctors. Furthermore, the existence of the agency relationship and the possibility of "supply-induced demand" makes the demand for health care a complex phenomenon.

But the task is not hopeless. The present forecasting procedures could be improved in several ways.⁴ For example, "careful study of the responsiveness of supply to changing salary and work patterns both at home and abroad . . . the use of a wider range of policy instruments (for example, remuneration and flexible, less specific courses of study) to influence the supply and demand of physicians . . . the production of regular annual forecasts showing the cost of alternative policies" are needed.⁴

NURSES

The lack of detailed analyses of nursing manpower is even greater than that of medical manpower; indeed the Royal Commission³ was "concerned that relatively little progress has been made on the major recommendations scheduled by the [Briggs] Committee" (which had reported in 1972) "for immediate action . . . for example an effective manpower policy." This deficiency has begun to be overcome mainly by operational researchers but also more recently by economists.

For example, Gray and Smail,⁵ in examining the trends in nursing manpower over the last 20 years with a view to forming a base for planning nurse manpower in the future, have attempted to explain why nursing staff numbers have grown as they have and also why the nursing pay bill has increased. Such trends have to be understood, together with the influences of both demands and supply on patterns of growth, before any effective manpower policy for nurses can emerge. It is this lack which has led to a failure to implement this recommendation of the Briggs committee.

Next week's article will continue to examine the organisation of health care resources.

References

- 1 Mooney GH, Drummond MF. Essentials of health economics. Part III—Developing health care policies. *Br Med J* 1982;285:1329-31.
- 2 Burchell A, Gilbert BK. *Appraisal of development options in the National Health Service*. London: DHSS, 1982.
- 3 *Report of the Royal Commission on the NHS*. Cmnd 7615. London: HMSO, 1979.
- 4 Maynard A, Walker A. Medical manpower planning in Britain: a critical appraisal. In: Culyer AJ, Wright KG, eds. *Economic aspects of health services*. London: Martin Robertson, 1978:165-90.
- 5 Gray AM, Smail RGM. *Why has the nursing pay-bill increased?* University of Aberdeen: Health Economics Research Unit, 1982.

(Accepted 29 June 1982)

D-penicillamine is known to cause painful breast enlargement. Danazol has been used for treating this complication.¹ Is there any contraindication to using this drug to treat a 17-year-old girl with this condition? What dosage and course of treatment would be advised?

Breast enlargement appears to be a very rare complication of penicillamine treatment; and in the few cases reported it did not regress spontaneously when treatment was stopped. Danazol is an inhibitor of pituitary gonadotrophins and has weak androgenic effects. It has been used successfully in only two cases of penicillamine-induced breast enlargement^{1,2} so there is little information on which to base dose recommendations. I would start with 200 mg twice daily and continue for at least four weeks, increasing the dose (maximum 800 mg daily) if there has been no response after 7-10 days, or decreasing it if the response is satisfactory but side effects are troublesome. I would continue for longer than four weeks if necessary to achieve a complete response. There are no contraindications to the use of danazol in a 17-year-old girl, but pregnancy must be excluded before starting treatment. If contraception is required a non-hormonal method should be used.—LINDA BEELEY, consultant pharmacologist, Birmingham.

¹ Taylor PJ, Cumming DC, Corenblum B. Successful treatment of D-penicillamine-induced breast gigantism with danazol. *Br Med J* 1981;282:362-3.

² Rooney PJ, Cleland J. Successful treatment of D-penicillamine-induced breast gigantism with danazol. *Br Med J* 1981;282:1627-8.

Is there any evidence that metronidazole is of value in treating arthritis?

There is no evidence at the present time that metronidazole is a proved form of treatment for arthritis. Considerable research work is now in progress on whether there may be an association between

possible gut bacterial antigens and certain types of arthritis. This would obviously lead to interest in forms of "bowel sterilisation." At the present time, however, such treatment must be regarded as experimental and unproved.—G R V HUGHES, senior lecturer in medicine (rheumatology), London.

A 30-year-old married woman had her adolescent facial acne treated on two occasions with twice-weekly irradiation for an eight-week course. She worries about her health and has read that such treatment may be associated with a raised incidence of thyroid cancer in later life. Is this true?

Thyroid cancer can be induced by radiation. Information about this comes from the survivors of the atom bomb, the Pacific Island fishermen who were accidentally exposed during nuclear weapon tests, and children treated with x-rays for enlarged thymus glands and those who had irradiation to produce epilation as a treatment for scalp ringworm. Estimates of the doses of irradiation received by the thyroid gland in these groups have enabled risks to be calculated according to the doses received. In simple terms for every 0.01 Gy received by the thyroid gland the additional chance of developing thyroid cancer is estimated to be about 1 in 10 000. Without knowing the details of the treatment received by the patient with acne it is impossible to calculate the risk factors in her case. It seems unlikely that they are anything but minimal. Usually very low doses are used for non-malignant conditions and the thyroid gland would not be in the direct field and in her case would receive only scattered irradiation, which would probably be under 1% of the given dose. It would seem reasonable to reassure her that her chances of developing thyroid cancer are negligible.—DIANA BRINKLEY, consultant radiotherapist, London.