

- 6 Beckman JS, Beckman TW, Chen J, Marshall PA, Freeman BA. Apparent hydroxyl radical production by peroxynitrite: implications for endothelial injury from nitric oxide and superoxide. *Proc Natl Acad Sci USA* 1990;87:1620-4.
- 7 Thies RL, Autor AP. Reactive oxygen injury to cultured pulmonary artery endothelial cells: mediation by poly (ADP-ribose) polymerase activation causing NAD depletion and altered energy balance. *Arch Biochem Biophys* 1991;286:353-63.
- 8 Geeraerts MD, Ronveaux-Pupal MF, Lemasters LL, Herman B. Cytosolic free Ca^{2+} and proteolysis in lethal oxidative injury in endothelial cells. *Am J Physiol* 1991;261:C889-96.
- 9 Verkerk A, Jongkind JF. Vascular cells under peroxide-induced oxidative stress: a balance study on in vitro peroxide handling by vascular endothelial and smooth muscle cells. *Free Radical Research Communications* 1992;17:121-32.
- 10 Bradley JS, Johnson DR, Pober JS. Endothelial activation by hydrogen peroxide. *Am J Pathol* 1993;142:1598-609.
- 11 Bowry VW, Stanley KK, Stocker R. High density lipoprotein is the major carrier of lipid hydroperoxides in human blood plasma from fasting donors. *Proc Natl Acad Sci USA* 1992;89:10316-20.
- 12 Ross R. The pathogenesis of atherosclerosis: a perspective for the 1990s. *Nature* 1993;362:801-9.
- 13 Leake DS. Oxidized low density lipoproteins and atherogenesis. *Br Heart J* 1993;69:476-8.
- 14 Parhami F, Fang ZT, Fogelman AM, Andalibi A, Territo MC, Berliner JA. Minimally modified low density lipoprotein-induced inflammatory responses in endothelial cells are mediated by cyclic adenosine monophosphate. *J Clin Invest* 1993;92:471-8.
- 15 Halliwell B, Gutteridge JMC. *Free radicals in biology and medicine*. 2nd ed. Oxford: Clarendon Press, 1989.
- 16 Ferns GAA, Forster L, Stewart-Lee A, Nourooz-Zadeh J, Anggård EE. Probucol inhibits mononuclear cell adhesion to vascular endothelium in the cholesterol-fed rabbit. *Atherosclerosis* 1993;100:171-81.

Alternative career paths for doctors

Is the NHS facing up to its responsibilities as an employer?

In many careers the concept of a single job for life is being challenged—most recently by the Sheehy Report on the police.¹ In a personal view this week Liz Welsh argues that plateaus in medical careers are boring (p 944)² and that the medical profession must loosen up.

The development of a trend in hospital medicine away from single jobs for life will pose severe difficulties. Firstly, doctors make very considerable personal investment in time for training up to specialist grade. Secondly, after 15 or 20 years doing the same sort of work consultants wanting some new challenge may find their age a barrier to changing.

After graduation mechanisms for appraisal and career development are inadequate especially for those who want to look beyond the boundaries of the profession. Furthermore, formidable obstacles hinder moves away from hospital practice due partly to the limited number of suitable opportunities but mainly to the rigidity of the training and accreditation systems of the royal colleges and the perverse incentives of the reward structure, particularly the merit award system. Hearsay suggests that dissatisfaction at this is more widespread than it seems on the surface; if so, it would be desirable to determine the true extent of the problem.

That the NHS as a near monopoly employer does not seem to accept responsibility for the career development of doctors is a matter for concern. What is needed is a system for regular assessment of individual performance to identify potential both for the development of existing skills and for the acquisition of new ones. The needs for training and development have to be defined and mutually agreed on. For hospital doctors this could start from some form of peer review of clinical performance, which would identify career development needs (beyond clinical practice for those wishing to explore alternative career paths). Such an appraisal system should identify people's needs as early as possible because of the time it takes to train them in new skills. Thus a system is needed both to facilitate change and to identify those doctors who may—or perhaps should—be considering it.

A critical factor operating against career development at consultant level is the structure of hospital practice. In a firm of two consultants even study leave can be difficult to organise; a much larger firm would provide greater flexibility. Although a larger team approach would make career development and appraisal easier, it would raise issues such as the recognition of seniority among consultants and the safeguarding of the training of junior doctors.

Because of the extent to which they dictate the use of resources doctors' potential contribution to NHS management has been recognised; and indeed implicit in the recent reforms is the expectation that doctors will increasingly take up part time and full time management roles. With the introduction of medical directors, clinical directorates, and the develop-

ment of clinical audit the NHS is recognising the need for people with wide experience. But the requirements of these jobs must be considered in conjunction with the planned career development of the people who will fill them.

As the NHS goes through a period of change new opportunities are arising. Changes in doctors' careers must be seen as normal, and doctors seeking to change their careers must be actively assisted to do so. Doctors need to examine their own position in the light of what the NHS expects of them and of their ability and need to change. For doctors exploring career development, there is a spectrum of options ranging from complete change to the introduction of new activities into existing work patterns. As a major employer, the NHS urgently needs to establish a culture in which career development and change are the norm and are recognised as equally important to the organisation and to the individual person.

Given adequate resources, postgraduate deans would seem particularly well placed to contribute. As "programme directors" based in regions, they could plan and organise assessment, guidance, and training schemes. Consideration might be given to piloting an experimental system of professional relicensing, which would have the effect of separating professional appraisal from individual contracts of employment. Alternatively, an institution based approach could focus on the professional development of individual junior staff but become increasingly concerned with departmental performance and the needs of the institution for those in higher grades. A system of rolling contracts with built in reviews might in the long run be better than the current (effectively) tenured position for senior staff.

Within this framework, the special positions of both small trusts and academic medical staff need to be taken into account. Appraisal in general practice presents a different set of problems because of the different context in which general practitioners work. Formal recognition of the importance of the problem might be helped by the creation of a small number of fellowships for a graduate course in management and administration, restricted to young doctors who have completed their clinical training and who wish to enter the NHS management structure.

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Although these are the authors' views, many of the ideas were expressed at a recent seminar involving senior representatives of the medical profession, industrialists, and several health services managers.

1 *Inquiry into Police Responsibilities and Rewards*. HMSO: 1993. (Cmnd 2280.)

2 Welsh EA. Plateaus are boring. *BMJ* 1993;307:944.