based on general practitioners could be developed in Britain: general practitioners would be given full budgets according to the number of people they cared for. But quite apart from the administrative and managerial nightmares, there is no reason to suppose that such an organisation would provide a more efficient or effective service than the existing NHS.

The currently fashionable idea of the "internal market" borrows from the concept of the health maintenance organisation; Professor Alain Enthoven, who has recently popularised the idea of the internal market, is a major advocate of health maintenance organisations in the United States. With the internal market the health district would act as the health maintenance organisation, buying and selling care on behalf of its population according to criteria of efficiency as well as equity and geographical location. It could be argued, however, that the district health authority in Britain is already a health maintenance organisation of a sort—receiving its yearly money for its enrolled population from the government. The important question is thus whether anything would be gained by their trading through an internal market.

The Institute of Economic Affairs Health Unit has proposed British style health maintenance organisations, and other proposals for radical reform or replacement of the NHS have also drawn heavily on the concept of the health maintenance organisations. For example, the Adam Smith Institute has proposed that "health management units" should enrol patients and contract with a largely privatised hospital system to provide care for patients, as many health maintenance organisations do in the United States. These schemes are, however, based on ideological acts of faith and offer little to the task of improving equity and allocating resources more effectively in the British NHS. It should not be forgotten that the friendly societies and working men's guilds that existed before the NHS used capitation fees from

working people to contract for health care. Thus to adopt a system of health maintenance organisations could be to return to a voluntary system of care in which coverage was uneven and planning virtually non-existent.

Back in the United States the Rand Corporation has conducted a large 10 year study of health maintenance organisations with a grant of over \$100m from the federal government.^{1,2} The study compared health maintenance organisations with other ways of providing and financing health care. The study has concluded that the costs of sharing can cut the usage of healthcare services and that prepaid schemes are cheaper than fee for service schemes but that the availability of care will not match need geographically. This means that the advantages of health maintenance organisations are irrelevant to Britain, where costs are already low, but the disadvantages are very relevant because the provision of care is already unequal. The Rand team's research has suggested that health maintenance organisations may underprovide just as fee for service schemes overprovide.³ The poor and chronically sick would inevitably be the main losers because of underprovision, and arguments that this would not happen if health maintenance organisations were introduced within the NHS are unconvincing.

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No stopping no fault

Even barristers are supporting no fault compensation

After years of inertia there are now almost daily developments on the issue of compensating those injured by medical treatment. Probably the most important recent development has been the support expressed for no fault compensation by eminent lawyers at the annual bar conference (p 939). Around the world—and particularly in the United States—lawyers have been one of the main forces obstructing the introduction of such schemes. The support expressed for introducing such a no fault scheme by the chairman of the Law Commission and the judge who made the first £1m award in a case of medical negligence must thus greatly increase the pressure on the government to act.

Yet in a letter to a member of parliament dated 19 September Edwina Currie, the junior health minister, wrote: "Whilst there have been some changes in circumstances since 1978 [when the Royal Commission on Civil Liability and Compensation for Personal Injury reported], notably an increase in the number of cases coming before the courts, and in the level of damages, these changes are of degree rather than of kind. The basic arguments remain unchanged. The government therefore considers that the basis for seeking legal compensation for injuries suffered should continue to be through litigation in the courts." The naysaying civil servant who drafted this bureaucratic masterpiece is likely to

succumb to the increasing pressure for change eventually, but it may not matter even if he or she does not—because a meeting to be held at the Royal Society of Medicine in January will consider the option—suggested in the *BMJ* (28 May, p 1487)—that health workers, health authorities, and insurance companies might get together and create a no fault scheme independently of the government.

Such a development would be much preferable to the option now being hotly debated of introducing differential defence society subscriptions for doctors from different specialties. This would do nothing to address the underlying problems, and, although differential subscriptions might help a few doctors financially in the short term, little would be achieved in the long term (p 984). Because of these arguments over differential subscriptions the defence societies have delayed announcing their subscriptions for next year, but a high figure is inevitable.

A final development in this increasingly complex issue concerns the economics of the various systems of compensating those injured by medical treatment. The primary argument against a no fault scheme has often been the cost, but a group from the Centre for Sociolegal Studies in Oxford and the King's Fund Institute has estimated that the British system costs about £75m a year and that the Swedish system

could be replicated in Britain for about £50m.¹ The current British system compensates about three people out of every 100 000 of the population with an award of £15 000, whereas the Swedish system compensates 10 times as many people with much greater efficiency and an average award of about £3200.

Now that lawyers and economists are supporting no fault

compensation it is surely time for the government to think again—particularly when it ultimately meets most of the costs.

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Catching up the orthopods

Mechanical forces matter in tissues other than bone

For almost a century it has been recognised that bone responds to applied mechanical forces with resorption and new bone formation (Wolff's law).¹ This functional adaptation fashions bone to suit its mechanical environment, endowing optimum strength and stiffness² while keeping its weight and hence metabolic cost to a minimum. Our understanding of this mechanism is incomplete, but its therapeutic implications have been used in treating fractures and in operations to replace joints.^{3,4} Increasing the mechanical loading on bone increases its formation locally. Conversely, reducing the loading as with immobilisation results in disuse osteoporosis.⁵ More recently the fact that exercise reduces generalised osteoporosis has also been recognised.⁶

Not surprisingly similar effects have been observed in other components of the musculoskeletal system. In articular cartilage moderate physical activity changes the mechanical properties of the tissue.^{7,8} The tissue biochemistry of the tendons changes rapidly in response to different loads—again implying changes in mechanical behaviour.⁹ And we now know that this dynamic relation is also important in other connective tissues.

In hypertension arterial smooth muscle cells produce a factor that stimulates fibroblasts to synthesise elastin, which in turn modifies the extensibility of the vessel walls.¹⁰ When the smooth muscle cells are stretched they synthesise collagen and glycosaminoglycans, which also alter the mechanical behaviour of the tissue.¹¹ Endothelial cells respond to shear forces by releasing vasoactive substances that manipulate the contractility of the smooth muscle of the vessel wall.¹² In the cervix there are gross alterations in tissue microstructure before and during labour.^{13,14} This is physiological soft tissue remodelling on an enormous scale and is at least partly a response to mechanical stimuli.

Responses to mechanical forces have been reported in other sites including the skin¹⁵ and lung,¹⁶ with postulated mechanosensors to account for the changes in blood vessels.¹² An alternative, or parallel, mechanism may include the transduction of mechanical stimuli into electrical potentials that are then decoded by the cells, a possible explanation for the sensitivity of fibroblasts to applied electrical fields.^{17,18}

The importance of mechanical effects in the pathophysiology of many disorders may have been overlooked because we tend to relate all diseases to specific cellular abnormalities. But we need also to consider the interaction between the cells and the tissue matrix on which they depend for their

mechanical support. This has required an increasing awareness of biomechanics. The principles embodied in Wolff's law are no longer confined to orthopaedic conditions. Orthopods are, however, 100 years ahead.

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Correction

Silent myocardial ischaemia

In the editorial on silent myocardial ischaemia by Dr Stephen Campbell (24 September, p 751) the first sentence of the second paragraph should have read: "Silent ischaemia is defined as 'objective evidence for myocardial ischaemia in the absence of angina or equivalent symptoms,' and its prevalence is unknown," although over a quarter of all myocardial infarctions are unrecognised and a half of those that are unrecognised cause no symptoms at all."