procedure. There have been occasions when both sides have agreed to follow the procedure of the Advisory, Consultation, and Arbitration Service, and it would seem worth while for the Department of Health and the profession to give further thought to incorporating this in the guidance. The proposals for increasing self regulation by the profession through "three stern men" would also help for less serious incidents of personal or professional misconduct. Allegations of professional incompetence against junior doctors present real problems and tend to be dealt with informally by not reappointing them or by counselling them towards another specialty. Nevertheless, other NHS employees have felt that "double standards" may exist, and of course the GMC has no powers to consider matters of professional competence, though the council is now reviewing the scope of its disciplinary procedures (14 May, p 1409).

Given the increasing number of ways in which a practitioner's performance can be challenged, it is astonishing how little this subject is either taught or understood. The recent guide and the GMC handbook should be read by every doctor because it really could happen to anyone. Meanwhile, NHS management, while recognising that the NHS is to all intents and purposes a monopoly, has also to satisfy mounting public concern over the standards of professional care. We can only hope that the negotiations and the GMC's review are successful.

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Intravenous volume replacement: indications and choices

Fluids for volume replacement are indicated in hypovolaemia, which may occur because of haemorrhage, sepsis, peritonitis, burns, diabetic ketoacidosis, and trauma. Fluids may also be used in isovolaemic transfusion for plasma exchange or preoperative haemodilution. The most clamant indication for volume replacement is, however, circulatory shock, which may be classified into three categories: true hypovolaemia; relative hypovolaemia (peripheral vasodilatation—for example, sepsis); and cardiogenic. Volume replacement together with oxygen form the mainstay of initial resuscitation in the first two of these categories and may occasionally be necessary even in cardiogenic shock.[1]

The clinical effects of hypovolaemia vary with both its severity and rapidity of onset. Early recognition of hypovolaemia may be impeded by the body's compensatory responses: a young patient may be normotensive after moderate haemorrhage because of compensatory vasoconstriction, mainly in the skin and splanchnic circulations. In one experimental study a 10% reduction in blood volume produced negligible changes in heart rate and blood pressure but a 30% reduction in colon blood flow and oxygen availability.[2] Static measures of heart rate, blood pressure, and central venous pressure are poor indicators of the degree of hypovolaemia, and it is often more useful to look at indices of tissue perfusion—such as urine output, conscious level, peripheral venous filling, and skin temperature (relative to ambient and core temperature). In a postoperative patient the fluid balance chart is often the best guide to the likelihood of hypovolaemia.

The type of fluid loss does not influence the choice of which fluid to use for initial replacement, since success depends more on the rapidity and adequacy of repletion than on which fluids are used. In the face of massive blood loss the need for replacing red cells is obvious, but the choice of asanguinous fluid for resuscitation raises difficulties. The "colloid versus crystalloid " controversy is largely artificial and centres on philosophy, economics, and side effects. The philosophy of the proponents of colloids is that the key problem in shock is loss of circulating volume (mainly blood plasma) and therefore replacement with colloid is best. Since colloids tend to remain within the intravascular space smaller volumes are required and resuscitation is more rapid.[3] Proponents of cystalloids consider that the key problem in shock is a shrinkage of the entire extracellular fluid compartment and therefore replacement with crystalloids is best since they equilibrate rapidly between the intravascular and interstitial fluid spaces.[4] Because of this equilibration crystalloids need to be infused in amounts exceeding three times the intravascular deficit. (It is worth mentioning that dextrose 5% equilibrates not only with the interstitial compartment but also the much larger intracellular compartment, making it useless as a resuscitation fluid.[5])

The economic argument is clear, at least when albumin is used as the colloid: Moss calculated the average cost for a patient of resuscitation with an albumin regimen as $1040 while the cost for a crystalloid regimen was $8.[6] In Britain the cost of albumin is met by the transfusion services rather than from hospital pharmacy budgets, and it is also true that artificial colloids (especially gelatins) are considerably cheaper than albumin—but crystalloids remain the cheapest choice.

An important worry is the possible adverse influence of resuscitation fluids on pulmonary function.[7,8] Despite the theoretical benefit of colloids because of their oncotic pressure there is no consensus favouring either fluid type, but careful monitoring of fluid replacement is essential. One problem shared by all colloids (including albumin) but not by crystalloids is the risk of allergic or anaphylactoid reactions. The true incidence of these reactions is likely to be higher than realised, but severe reactions are rare.[9,10] Dextran 40 has been implicated in producing renal failure in patients with poor renal blood flow,[11] and stabilised plasma protein solution has recently been reported to affect renal function adversely when used in a model of haemorrhagic shock.[12] Though this possible effect of stabilised plasma protein solution has yet to be examined in a controlled clinical study, other authors have already expressed concern over the unnatural polymers and heterogeneous albumin that it contains because of the cold ethanol fractionation used in its production.[13]

The somewhat sterile colloid versus crytalloid controversy

may be resolved by a trial that reflects the common clinical practice of using these fluids in combination. Smith and Norman reported that a mixture of colloid and crystalloid produced significantly better results than either colloid or crystalloid alone—in a trial that included assessment of oxygen delivery and consumption.[14] My practice is to give colloid for the first 1500 ml of fluid replacement (to achieve rapid restoration of intravascular volume) and thereafter to use a combination of crystalloid and colloid (in a ratio of roughly two to one) supplemented by red cell transfusion to maintain a packed cell volume of about 30%. The colloid I use is gelatin since it is inexpensive, has a shortish half life, produces an osmotic diuresis, and is free from adverse effects on haemostasis and crossmatching.

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Regular Review

Financing health care: lessons from abroad

ROBERT J MAXWELL

Rudolf Klein has recently examined three options for raising more money for health care in Britain: user charges, hypothecated tax, and private insurance.[1] He suggests that all are irrelevant if the root problem is that the Chancellor does not *want* to spend more money on the NHS rather than that the general tax yield is insufficient to allow him to do so. And he concludes that what we need is not a quest for a new funding formula so much as ways of changing the flows of funds within the NHS—for example, by linking income to service activity.

In looking at how other countries finance health care we should consider not only the sources of funds and levels of expenditure but also how services are provided and the methods of financial allocation and reimbursement.

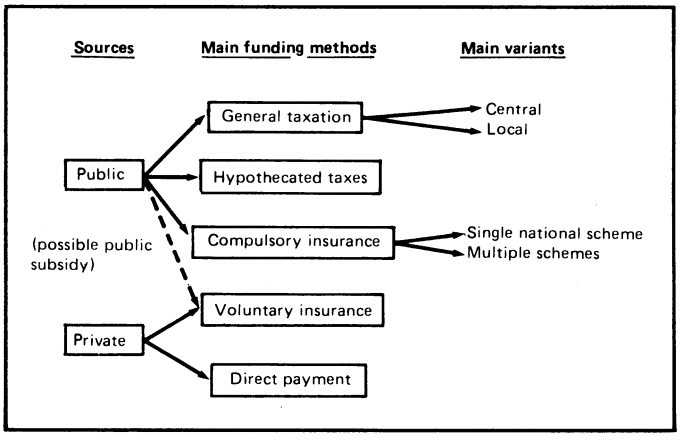

FIG 1—Who pays? (Reproduced by permission of the Royal Society of Medicine.[10])

Sources of funds

While there are almost endless variations in the patterns of national financing, they fall into families which can in turn be related to one relatively simple basic model (fig 1).

Among the major Western countries only the United States has a public share for the financing of health services below 50%—41% in 1985. The average figure in the Organisation for Economic Cooperation and Development (OECD) is just below 80%, having risen sharply from around 60% in 1960 to 78% in 1980 and then levelled off.[2] This trend reflects a substantial extension of public coverage, especially for hospital care, in the 1960s and 1970s. The current British figure of 90% is similar to that of Sweden and Norway and a good deal higher than, for example, that of West Germany at 78% or France at 71%. While the trend since 1960 throughout the OECD has been one of extending coverage that is not necessarily immutable.

Since 1980 there has been almost no increase in the proportion of health care expenditure borne publicly in OECD countries, and the levelling off might be followed by some reduction of the public share. This is obviously being considered in the Prime Minister's internal review of the NHS, but the government should beware of too simplistic a