of funding: in notable contrast to all the other measures, it is paid for from federal sources for all United States citizens. It costs more than $2 billion a year, and its unique availability, in the absence of reliable information about outcomes of dialysis in the elderly, may create as many problems as it solves. The report recognises anxieties about the indiscriminate use of cardiopulmonary resuscitation and life sustaining antibiotic treatment in the elderly: while saving life is a legitimate goal, prolonging death is not. There is no optimism about rigid guidelines in either case. Sensitivity to the views of patients and relatives, discussions with them and with staff, and a humane awareness of quality of survival are, however, not easy to encourage in a vast, heterogeneous, and litigation conscious medical culture.

The report presents information clearly and does not shrink from irreducibly awkward problems. It should succeed in its aim of clarifying for legislators the issues without over-simplifying them. Should the Department of Health and Social Security now contemplate a similar exercise? For several reasons, probably not. The NHS, rough beast that it is, at least succeeds in combining cost containment with a concept of equity. Individual clinical decisions about life sustaining technology and the elderly are generally uninfluenced by the fear of litigation and are made far from the sound of any individual or corporate cash register. Awareness of costs is general rather than particular but probably sufficient to bring to mind Haldane's aphorism "We are poor, therefore we must think" whenever an expensive venture for an elderly (or indeed any) patient is contemplated. The NHS also commands skill in the care of the elderly that is impressive by the modest international standards of the discipline.

Therein lies the real importance of the Office of Technology Assessment's report. Its final chapter is the most powerful argument that has yet been advanced for developing the specialty of geriatric medicine in the United States. No one can legislate for clinical wisdom, but the discerning and therefore effective and economically realistic use of life saving technologies in the elderly will become far more likely if American physicians can be persuaded to take an interest in the care of the elderly for its own sake. If this report does nothing more than increase the pressure to achieve the Rand Corporation's target of 8000 full time equivalent geriatricians providing patient care together with 900 clinical academic staff much will have been accomplished.[2] And if the riddle of devising some generally acceptable form of reimbursement for humane and broadly low technology care of the elderly in the United States can also be solved these 8900 doctors may even be able to make a living. Meanwhile, in the words of a fictional hospital administrator in a satire on terminal care in America, "Your last two weeks on earth may not be your most comfortable, but sure as hell they'll be your most expensive."[3]

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Cancer after transplantation

The risks are small

Is cancer really more common after organ transplantation? Skin cancer and lymphomas are the cancers most commonly described in patients who have received transplanted organs.[1-7] In south Queensland skin cancer is 20 times more common in transplant recipients than in the general population[2]; the relative risks for skin cancer are also increased in France, Sweden, and Britain,[8] and a third study suggested that the increase was significant.[5] Evidence for a significant increase in cancer of other organs is, however, conflicting, and depends on data from few patients.[4 5 9] Whether there is an increase in overall tumour incidence is also not clear.[8 10] Rates of cancer have, however, been assessed differently, making interpretation difficult. A large controlled study is required to determine if the incidence of cancer is increased after transplantation and which tumours are important.

We also need studies of risk factors. A study of skin cancer in patients who had received kidney transplants showed that Anglo-Saxon or Celtic origin, fair skin, blue eyes, age, and sensitivity to light were predisposing factors—as they are in the general population.[11] Tumours occurred on surfaces exposed to the sun but developed irrespective of the amount of exposure after transplantation. No significant relation was found between the development of skin cancer and the patient's primary renal disease, graft function, or dosage of immunosuppressive drugs.

The importance of viral infections as a risk factor for cancer in transplant recipients is not clear. Squamous cell carcinoma of the skin, which is believed to be caused by a virus, occurs more often than basal cell carcinoma in transplant recipients,[2 4] whereas the opposite is true in the normal population. Moreover, the genome of human papillomavirus was detected in one third of squamous carcinomas from transplant recipients.[4] Skin warts, which are common in transplant recipients, were not, however, observed to become malignant, and the incidence of specific infections with herpes virus or human papillomavirus was similar in transplant recipients whether or not they developed skin cancer.[11] Nevertheless, the incidence of cervical cancer may be increased in women with organ allografts: abnormal cervical histology was noted in 67% of such women and human papillomavirus types 16 and 18, which are believed to have malignant potential, were isolated from 49% after colposcopy.[12]

Immunosuppressive treatment may be a further risk factor. Patients who had had heart transplants and were given high doses of immunosuppressive drugs were more likely to develop malignancies, particularly lymphoma, than patients given lower doses.[6 7] An increased incidence of lymphoma was seen also in patients given cyclosporin A in the original high dosage or in combination with other immunosuppressive agents.[13] With current doses the incidence of all tumours in recipients of heart, liver, bone marrow, or kidney transplants is similar whether cyclosporin A or conventional treatment with azathioprine and prednisolone is given.[14] Other factors, including the possible immunosuppressive effects of previous uraemia and blood transfusions, require further investigation.

Because transplantation is a new procedure the problem of malignancy may largely lie ahead. Cancer occurs more often in older patients and in those with long surviving grafts[1 2 4]; in patients followed for 15 years skin cancer was observed in 44% and other cancers in 14%.[4] Skin cancer, for which the

prognosis is good, accounts for few deaths in transplant recipients,[2-4] but 46% of patients with other tumours die of their malignancy or because of organ rejection after withdrawal of immunosuppression to prevent spread of the tumour.[4] Survival of transplant recipients with cancer is similar to that of those without tumours for the first eight years after transplantation but thereafter declines rapidly.[15]

Controlled multicentre studies (organised perhaps by the European Renal Association) are necessary to determine if tumours other than skin tumours occur more often in transplant recipients followed for at least five years. In the short term the risks seem small and do not detract from the benefits of successful transplantation, even in the elderly.

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Microdiscectomy for treating lumbar disc protrusion

An important advance that merits wide adoption

Four out of every five people experience an episode of disabling back pain during adulthood. Most episodes settle with conservative treatment, but many patients require an operation, the commonest indication for which is lumbar disc prolapse with nerve root compression. In Britain laminectomy is still the most widely used approach, though fenestration is becoming more popular. In either case a 10-12 cm incision is needed. The operation takes about an hour to perform, often requiring a transfusion of blood, and patients need a week to 10 days in hospital. It inflicts considerable muscle trauma with denervation[1] and reduced segmental movement because of scarring.[2] There is a risk of infection, neurological damage, epidural haemorrhage, and arachnoiditis, and postoperative disability lasts from six weeks to six months.[3-5]

In an attempt to overcome this morbidity microdiscectomy has been developed over the past few years, principally for treating virgin disc herniations.[6-12] It incorporates all the elements of the traditional approach but uses the operating microscope, which permits the operation to be performed through a 2 cm incision. No patient is considered for microdiscectomy without an adequate trial of conservative treatment. Radiculography or computed tomography is performed preoperatively to confirm the diagnosis and the level of the lesion. Microdiscectomy is contraindicated if there is any spinal stenosis.[13]

Because magnification and microinstruments are used minimal retraction of the nerve root is required. Extradural fat is preserved, minimising the chances of subsequent adhesions, and accurate bipolar coagulation is used resulting in a minimal loss of blood. It is often possible to pierce the annulus bluntly rather than incising it so that it closes like a valve, reducing the risk of recurrent disc prolapse.[10] Unlike with conventional laminectomy, the surgeon sees the inside of the disc space,[12] and video cameras may observe and record the operation. According to its proponents microdiscectomy takes about 30 minutes to perform, and blood transfusion is not necessary. Most patients leave hospital within two or three days. Indeed, some centres perform the operation on outpatients, and 90% of patients may resume their previous work without pain.[10 14]

Technical errors include operating at the wrong level and failing to discover a sequestrated disc or recognise canal stenosis. Infection of the disc space and recurrent herniation may occur but are less common than with conventional techniques.[11] For the right patients microdiscectomy is an important advance, and follow up studies have removed doubts about its long term results.[11 15]

Why then, with so much in its favour, has microdiscectomy not been more widely adopted? Some surgeons have not yet accepted microdiscectomy either because of a lack of experience or because of concern that the rate of complication may increase as many surgeons take up a new operation. Clearly adequate instruction has to be provided before it can be safely adopted on a wider scale and this will require a large training programme. The cost of providing equipment will also be substantial, but the cost to the community of not adopting these techniques would be even greater.

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