

These were those trusts that were deemed to have land and buildings surplus to their requirements and were expected to dispose of them.

Accordingly, it is now apparent that trusts are actually subject to very tight monitoring and direction. This is effected through controls applied to the three traditional statements of account: the balance sheet; the income and expenditure account; and the funds flow statement. In addition, there exists the potential for a further tightening of the screw in that if a trust

turns out to be particularly profitable—earning over and above the 6% return on capital employed—it can be required to pay dividends on its public dividend capital.

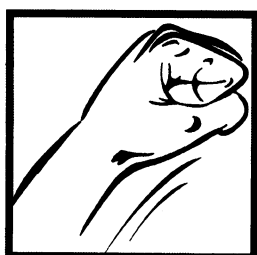
The trust regime is a good illustration of how NHS accounting practice is increasingly following what has been common practice in the world of industry and commerce. It is probably the major item currently on the agenda of NHS financial management and it is, of course, an issue of financial accounting.

## Controversies in Management

### Should carotid endarterectomy be purchased?

#### Treatment avoids much morbidity

Roger N Baird



This is the nineteenth in a series of articles examining some of the difficult decisions that arise in medicine

A neurologist writing in 1978 on the treatment he would want if he had a transient ischaemic attack advised that the blood pressure should be checked and investigations instituted to prevent further ischaemic attacks which might culminate in stroke or death.<sup>1</sup> The article did not mention health gain and cost, because in 1978 disease based healthcare purchasing was confined to a few underexploited treatments. Health purchasers today, however, have to judge the value of carotid endarterectomy against other attempts to reduce the burden of morbidity from stroke. These include screening for and control of hypertension, antiplatelet therapy using aspirin, and rehabilitation and caring for people who have had a stroke.

#### Scientific evaluation

The prognosis of transient ischaemic attacks was recently studied in 184 patients from 10 group practices in Oxfordshire, and the risk of stroke was 11.6% during the first year, rising to 29.3% within five years.<sup>2</sup> Carotid endarterectomy has the greatest benefit for patients with transient ischaemic attacks of the brain and eye who have a greater than 70% stenosis at the origin of the relevant internal carotid artery in the neck. Two recent large controlled trials have shown that stroke and death rates were reduced in patients having surgery (figure); in a European study there was a sixfold reduction at three years with 2200 patients randomised<sup>3</sup> and in a North American study of 1000 patients there was a tenfold reduction at 18 months.<sup>4</sup> Other indications for surgical clearance of a severe carotid stenosis include crescendo transient ischaemic attacks, recovered transient ischaemic attacks lasting

more than a day, chronic retinal ischaemia, retinal infarction, and non-disabling stroke. In the past diagnostic arteriography has added a small extra risk. The risk has lately been lessened by technical improvements in catheters and the use of non-ionic contrast material. Today the best centres seldom use carotid arteriography. Clinicians rely on colour Duplex ultrasonography of the neck and computed tomography of the head to clinch the diagnosis, augmented by magnetic angiography when interpretation is difficult. Conditions giving rise to uncertainty include loops of the carotid artery and failure to detect a fine jet of blood by Doppler when the image shows a tight stenosis.

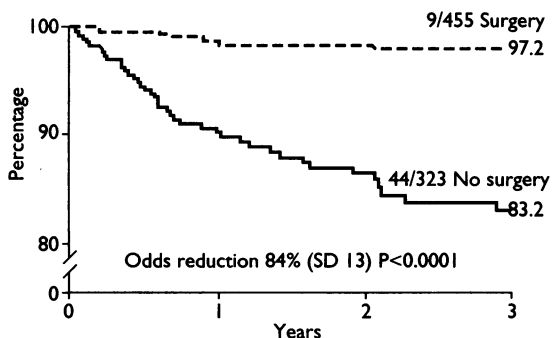
Efforts are continuing to identify better patient populations and better techniques. Atheromatous plaques with a heterogeneous ultrasonic appearance seem to carry a greater risk of stroke than homogeneous fibrous strictures. Trials have shown that closing the carotid arteriotomy around a gusset-like patch of saphenous vein or prosthetic material can improve the early results in patients with extensive atheroma and in those with small arteries, particularly women, as well as reducing the rate of restenosis.

#### Audit

Up to date data on outcomes after carotid endarterectomy should be available to surgeons and, through them, to patients, general practitioners, and other purchasers, either by publication<sup>5</sup> or by validated audit. This cannot happen without each surgeon's commitment to accurate and complete records, including clinical indications, operative technique, and outcome. The risks should not exceed those set out by the committee on carotid surgery standards of the American Heart Association's Stroke Council. These standards are a combined perioperative morbidity and mortality of 5% where the indication is transient ischaemic attack, rising to 7% in patients who have had minor stroke and are having surgery to prevent severe strokes.<sup>6</sup> These targets are unlikely to be achieved by surgeons whose annual carotid workload is in single figures. It is generally agreed that a successful endarterectomy confers excellent protection and the post-operative risk of stroke is only about 1% a year.

#### Historical background

From the above data it is unclear why doubts have been raised about the efficacy of the operation. The



Life table analysis showing numbers of ipsilateral ischaemic strokes in endarterectomy and medically treated group.<sup>3</sup> Absolute difference at three years was 14% (SD 2.9)

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explanation may lie in the evolution of the procedure. The operation was first described in the early 1950s by Eastcott in London, and was popularised in the United States by DeBakey in Texas. By the mid-1970s a generation of surgical trainees had emerged from the teaching centres. A decade later in the United States very many operations were being done and selection was no longer confined to symptomatic patients with appropriate carotid lesions. A study showed that 32% of a random sample of 1302 Medicare patients had surgery for inappropriate reasons and 9.8% had a serious perioperative complication.<sup>7</sup> Public concern led to reduced enthusiasm, and Medicare introduced stringent guidelines for payments for endarterectomy.<sup>8</sup>

### Present situation

In the United Kingdom and most other countries the growth of the operation has been much more restrained and 40 years after its introduction many feel that its potential for preventing stroke remains unfulfilled.<sup>9</sup> Since the multicentre trials were published, interest has picked up among general practitioners, neurologists, and ophthalmologists. Disease based transient ischaemic attack clinics are being set up, and diagnostic Duplex ultrasonography is widely available. Whatever the arguments about the optimal use of resources, it is difficult to deny an effective operation for patients with repetitive transient ischaemic attacks

and high grade carotid stenosis. The operation costs the NHS about £3000 compared with an average cost of £45 000 for rehabilitation and care if the stroke is not prevented.<sup>10</sup> Perhaps the final word should go to the neurologist in the *BMJ* 15 years ago,<sup>1</sup> who said that if he had a transient ischaemic attack he would choose his surgeon and anaesthetist carefully, and hope that sense would overcome apprehension, leading to a successful carotid endarterectomy.

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- 3 European Carotid Surgery Trialists' Collaborative Group. MRC European carotid surgery trial interim results for symptomatic patients with severe (70-99%) or with mild (0-29%) carotid stenosis. *Lancet* 1991;337:1235-41.
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- 5 Magee TR, Earnshaw JJ, Cole SEA, Hayward JK, Baird RN, Horrocks M. A 5 year review of carotid endarterectomy in a vascular unit using a computerised audit system. *Ann R Coll Surg Engl* 1992;74:430-3.
- 6 Beebe HG, Clagett P, DeWeese JA, Moore WS, Robertson JT, Sandok B, Wolf PA. Assessing risk associated with carotid endarterectomy. *Stroke* 1989;20:314-5.
- 7 Winslow CM, Solomon DH, Chassin MR, Kosecoff J, Merrick NJ, Brook RH. The appropriateness of carotid endarterectomy. *N Engl J Med* 1988;318:721-7.
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## Purchasers need a broader perspective

Mark Lambert



Stroke is one of the leading causes of premature death and disability in the United Kingdom,<sup>1</sup> and district health authorities have an important responsibility for purchasing appropriate services to meet this challenge. Is carotid endarterectomy such an appropriate service? To answer this question, we need to examine the benefits to the individual from the procedure and then to try to extrapolate this effect to a population.

### Benefits to individuals

Two comparable multicentre randomised controlled trials have measured the outcome of carotid endarterectomy in people with severe symptomatic carotid artery stenosis. The reduction in the absolute risk of a disabling or fatal stroke (the outcome with probably the greatest public health significance) was estimated at 5% in the European trial<sup>2</sup> and 10% in the North American study.<sup>3</sup> Both studies used experienced surgeons with a good operative record. These figures provide compelling evidence of the benefit to individuals from surgery, which should not be ignored. Of course, people in this risk group often die of other causes, but the absolute benefit of endarterectomy remains, even when such deaths are taken into account.

This measure of benefit, however, omits the morbidity experienced by the many people who have cerebral angiography. Depending on the investigation protocol used and on the experience of the person performing the angiogram, morbidity from this procedure alone can negate any benefit which might result from surgery.<sup>4</sup> Morbidity might be avoided by using non-invasive diagnostic techniques, but at present even centres with the most experience have been unable to eliminate the need for angiographic studies.<sup>5</sup>

Appreciable risks are thus associated with both investigation and surgery, even under ideal conditions. Unfortunately, many procedures are being carried out under less than ideal conditions. For example, inexperienced practitioners more often produce unfavourable outcomes in vascular surgery,<sup>6</sup> yet a survey in 1989 indicated that 22% of procedures were carried out by surgeons undertaking fewer than 10 operations a year.<sup>7</sup> Considerable variation in the choice of investigations was also noted, and this could result either in excessive numbers of people being exposed to the risks of angiography or in inappropriate surgical referral.

The Association of British Neurologists has recently produced guidelines for the management of people who have had a transient ischaemic attack or uncompleted ischaemic stroke.<sup>8</sup> In principle, this advice should increase the number of patients being managed under ideal conditions. However, the history of guidelines suggests that not all surgeons will change their practice.

### Population benefits

How could the benefits for the individual translate into improvements in the health of a community? If all those with severe carotid artery stenosis who had had a transient ischaemic attack underwent surgery the overall reduction in the incidence of first stroke has been estimated to be 0.5%.<sup>9</sup> This is based on the premise that a quarter of people who have had a transient ischaemic attack have arterial disease amenable to surgery and that the absolute reduction in the risk of stroke from surgery is 10%. This estimate of the number of suitable operative candidates is rather generous. Epidemiological survey suggests that 80% of

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