contralateral lesions leading to velocity enhancement but no filling defect. All were asymptomatic. Twenty-four patients had abnormal intraoperative scans. Thirteen patients had visible kinking of the ICA or reperfusion hyperaemia; 12 of these patients had normal 6-week scans and one had a mild residual kink but no symptoms. Eleven patients had visible colour-filling defects and significant velocity enhancement. Nine of these were reopened and refashioned. Subsequent duplex imaging was satisfactory in all cases and 6-week scans were normal. One patient had an occluded ICA at operation and developed a dense stroke after operation. Another had residual raised velocities distally which remained at 6 weeks. This patient had no symptoms.

Conclusion: Intraoperative velocity measurements alone cannot be relied upon as an indication for reoperation. Significant velocity enhancement combined with a visible filling defect appears to represent a satisfactory criterion for reoperation. There were no complications as a result of reoperation. There was no early restenosis in the whole group and there were no neurological sequelae in any patient with a satisfactory scan using the above criteria.

Transcranial Doppler-directed dextran therapy in the prevention of postoperative carotid thrombosis

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Background: Evidence suggests that embolization precedes carotid thrombosis, a previously unpredictable event complicating 2–3 per cent of all carotid endarterectomies. It was hypothesized that dextran 40 therapy might prevent progression to complete thrombosis in high-risk patients.

Methods: Between October 1995 and July 1998, 400 consecutive patients were monitored following carotid endarterectomy using transcranial Doppler ultrasonography. Those with sustained embolization (more than 25 in 10 min) or those with emboli that distorted the middle cerebral artery waveform were commenced on an incremental dextran 40 infusion.

Results: Two hundred and sixteen patients (54 per cent) had one or more emboli detected (96 per cent within 2 h of flow restoration) but only 15 (4 per cent) required dextran therapy. Embolization ceased in each case although the dextran dose had to be adjusted in four. In one of the latter patients, embolization recurred on day 5 but was again controlled with high-dose dextran. Overall, the death and any stroke rate was 2 per cent and no patient suffered a stroke due to carotid thrombosis.

Conclusion: A few patients develop sustained embolization following carotid endarterectomy which, in previous studies, has been shown to be highly predictive of carotid thrombosis. The authors' experience to date suggests that dextran can stop this phase of embolization and prevent progression to complete carotid thrombosis. However, the dose of dextran has to be adjusted in 25 per cent of patients (i.e. blind administration of dextran may not be effective) and, very rarely, embolization may recur later.

Near-infrared spectroscopic monitoring of patients undergoing carotid endarterectomy under locoregional anaesthesia

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Background: The level of cerebral desaturation, which is associated with a change in level of consciousness during carotid endarterectomy, was measured by near-infrared spectroscopy.

Methods: Patients were recruited in two centres over 24 months. Surgery was performed under deep and superficial cervical block using 0·5 per cent bupivacaine, with temazepam as a premedication. Cerebral oxygenation was measured by Critikon 2020 near-infrared spectrophotometers (Johnson and Johnson Medical, Newport, UK).

Results: Forty-nine procedures were performed on 45 patients (39 men; age range 52–84 (mean 68) years). Recordings were made from the ipsilateral frontal site in 38 patients, from the ipsilateral temporal site in 23 and bifrontally in eight patients. Monitoring failed in three subjects. Percentage changes in regional cerebral oxygen saturation are detailed below.

	Change in saturation (%)	
Site	Symptomatic (n = 8)	Asymptomatic (n = 41)
Frontal (ipsilateral)	6·4 (2·5–14)*	2·4 (0–8)*
Temporal	3·8 (2–8)*	1·5 (0–8)
Frontal (contralateral)	2 (0–4)	0·2 (0–0·5)

Values are mean (range). *P < 0·01

Conclusion: Significantly different levels of cerebral desaturation occur in patients with neurological compromise during carotid endarterectomy compared with those who are unaffected.

Transcranial Doppler ultrasonography as a predictor of haemodynamically significant carotid stenosis

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Background: Transcranial Doppler (TCD) ultrasonography can detect evidence of collateral flow across the anterior communicating artery and/or the posterior communicating artery, which occurs when there is significant alteration of 'inflow' to the brain. The aim of the study was to determine the blood flow velocity produced by a carotid stenosis which produces this haemodynamic effect on the cerebral circulation and evokes collateral circulation.

Methods: Forty-eight patients with varying degrees of carotid stenosis (10 per cent to occlusion) who underwent both carotid duplex and TCD examination were reviewed. An ATL HDI 3000 ultrasound system was used for the carotid and TCD studies. The carotid examination recorded peak-systolic velocity (PSV) and end-diastolic velocity (EDV) in the carotid systems bilaterally. TCD recorded Doppler spectra from the bilateral

middle cerebral, anterior cerebral, posterior cerebral, intracranial vertebral and basilar arteries. Collateral flow was assessed in two ways: 'intracranial crossover' collateral and 'posterior to anterior' collateral. Each internal carotid artery (ICA), together with the ipsilateral hemisphere, was analysed for the presence or absence of collateral flow. Data were expressed as mean(s.e.m.).

Results: The PSV of the group with collateral circulation was 472(14) cm s^{-1} and that of the group without collateral flow was 164(3) cm s^{-1} ($P < 0{\cdot}0001$, Mann–Whitney test). The respective EDVs were 158(13) and 58(7) cm s^{-1} ($P < 0{\cdot}0001$).

Conclusion: PSVs and EDVs in the ICA, in conjunction with collateral flow measured by TCD, are indicators of a haemodynamically significant carotid lesion, and provide more information than two-dimensional imaging studies. In the future, parameters set by combining carotid duplex and TCD investigations may represent the 'gold standard' for evaluation of cerebral blood flow.

Deaths from ruptured abdominal aortic aneurysm in Wales

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Background: The aim was to determine the true incidence and operative mortality rate of patients with ruptured abdominal aortic aneurysm (AAA) who reach hospital alive in Wales.

Methods: Patients presenting with a ruptured AAA between September 1996 and August 1997 were analysed. The data were collected prospectively by an independent body, observing strict confidentiality.

Results: Two hundred and thirty-three patients with confirmed ruptured AAA were identified. One hundred and thirty-three patients (57 per cent) underwent attempted operative repair. Eighty-five (64 per cent) died within 30 days. All 100 patients who received no operation died. Of the 233 patients, 92 were admitted under vascular surgeons (VSs) and 141 under non-vascular surgeons (NVSs). VSs operated on 82 patients (89 per cent) of whom 50 (61 per cent) died; NVSs operated on 51 (36 per cent) of whom 35 (69 per cent) died.

Conclusion: This study is the only independent prospective study of death among patients with ruptured AAA who reached hospital alive. Some 57 per cent of the patients with a ruptured AAA were operated on. The operative mortality rate was 64 per cent and the overall mortality rate was 79 per cent. VSs were significantly more aggressive (89 per cent) in the management of ruptured AAA (i.e. more likely to operate) than NVSs (36 per cent) ($P < 0{\cdot}0001$). Despite this, the operative mortality rate for VSs was 61 per cent, whereas for NVSs it was 69 per cent ($P = 0{\cdot}372$). The overall mortality rate (including operated and non-operated patients) for NVSs (89 per cent) was significantly higher than that for VSs (65 per cent) ($P < 0{\cdot}0001$). In conclusion, ruptured AAA is common in Wales and associated with a high mortality rate even when managed by VSs.

Limb outcome following failed femoropopliteal polytetrafluoroethylene bypass for intermittent claudication

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Background: Femoropopliteal (FP) bypass using polytetrafluoroethylene (PTFE) is still considered by many surgeons to be a reasonable procedure for severe intermittent claudication (IC) without limb-threatening ischaemia. The consequences of FP graft failure were examined.

Methods: Over 8 years, 54 patients had 55 FP grafts (that subsequently occluded) inserted for severe IC (42 PTFE and 13 vein grafts) above (30) or below (25) the knee. There were no operative deaths. During the same interval a total of 191 FP grafts were placed, 100 of which were vein grafts. Patient demography and risk factor analysis was similar for both groups.

Results: Nineteen patients required amputation subsequent to a failed graft, all of these following PTFE grafts. Mean time to occlusion was 12·2 (range 0–79) months. For PTFE grafts, the mean(s.d.) ankle index rose from 0·51(0·14) to 0·95(0·15) after operation but fell to 0·25(0·15) after occlusion, confirming a highly significant deterioration from preoperative levels, which was not seen in vein graft occlusions.

Conclusion: Long-term FP bypass patency rates with vein are superior to those obtained with PTFE. Failed PTFE grafts show a significant deterioration in pressure indices compared with preoperative values. FP grafts for IC carry an intrinsic risk of limb loss which is much greater when vein is not used ($P < 0{\cdot}001$).

Superficial femoral angioplasty

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Background: Superficial femoral angioplasty (percutaneous transluminal angioplasty, PTA) is a widely performed therapeutic modality used throughout the UK in the treatment of intermittent claudication. However, there is still concern over its efficacy in the management of atherosclerotic occlusive disease. Long-term outcome was examined in patients undergoing PTA for short (less than 10 cm) occlusions or stenoses.

Methods: Data were collected prospectively for 413 patients undergoing femoral angioplasty and entered into a database for long-term outcome analysis. Patients were seen at 3, 6 and 12 months and at yearly intervals. Doppler ultrasonography and clinical assessment were performed in all patients and duplex imaging was carried out in those in whom there was doubt about patency. Finally, surviving patients were simply questioned as to whether they felt the original PTA to have been worthwhile.

Results: Mean follow-up time was 7 (range 2–11) years. Excluding an initial technical failure rate of 8 per cent, cumulative primary patency at 1, 2, 3, 4 and 5 years was 64, 55, 36, 21 and 14

