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# **Clinical Update:** Asymptomatic Carotid Disease Management

Asymptomatic carotid artery stenosis is a common clinical finding in contemporary practice, frequently identified during cardiovascular risk assessment or incidentally on imaging performed for unrelated indications. While the management of symptomatic carotid disease is well established, optimal management of asymptomatic carotid stenosis has remained an area of debate, particularly in the context of advances in medical therapy and evolving revascularisation techniques.

This clinical update reviews the historical and contemporary evidence underpinning management strategies for asymptomatic carotid disease, with particular focus on the role of carotid intervention alongside best medical therapy, and recent data emerging from the CREST-2 trial.

## Natural history and early surgical evidence

Asymptomatic carotid stenosis is generally defined as ≥50–60% internal carotid artery narrowing in patients without ipsilateral transient ischaemic attack or stroke within the preceding six months. Its prevalence increases with age and is strongly associated with hypertension, diabetes mellitus, dyslipidaemia and smoking.

Early randomised trials conducted in the pre-statin era demonstrated a long-term stroke reduction benefit from carotid endarterectomy (CEA) compared with medical therapy alone. The Veterans Affairs Cooperative Study first reported a reduction in ipsilateral stroke among surgically treated patients with asymptomatic carotid stenosis[1]. This was followed by the Asymptomatic Carotid Atherosclerosis Study (ACAS), which demonstrated a significant reduction in five-year ipsilateral stroke risk with CEA in patients with ≥60% stenosis, provided peri-operative stroke and death rates were low[2].

The Asymptomatic Carotid Surgery Trial (ACST-1) further confirmed the durability of this benefit, demonstrating sustained stroke risk reduction at both five and ten years following successful carotid endarterectomy[3–4]. However, these studies were conducted before the widespread adoption of contemporary intensive medical therapy, prompting ongoing reassessment of their applicability to current practice.

## Advances in medical therapy

Over the past two decades, improvements in antiplatelet therapy, lipid lowering, blood pressure control and diabetes management have substantially reduced baseline stroke risk in patients with carotid disease. As a result, optimal medical therapy is now universally recommended for all patients with carotid stenosis, regardless of symptom status.

Despite this, observational data suggest that a subset of patients with asymptomatic carotid stenosis remains at increased risk of ipsilateral stroke, particularly those with high-grade stenosis, disease progression, adverse plaque characteristics or significant cardiovascular comorbidity. This has driven continued interest in identifying patients who may benefit from revascularisation in addition to best medical therapy.

## Evolution and safety of carotid artery stenting

Carotid artery stenting (CAS) was initially developed as a less invasive alternative to endarterectomy, particularly for patients at higher surgical risk. Early trials in symptomatic patients, including EVA-3S and SPACE, reported higher peri-procedural stroke rates with stenting compared with surgery, reflecting early-generation devices and limited operator experience[10–11].

Subsequent trials incorporating improved stent technology, embolic protection devices and stricter credentialing demonstrated significantly improved outcomes. The Carotid Revascularization Endarterectomy versus Stenting Trial (CREST-1) demonstrated no significant difference in the composite endpoint of stroke, myocardial infarction or death between CAS and CEA, with comparable long-term outcomes on extended follow-up[5–7].

In asymptomatic patients, the ACT-I trial demonstrated non-inferiority of carotid stenting compared with endarterectomy when performed by experienced operators[8]. More recently, ACST-2 directly compared CAS and CEA in asymptomatic carotid stenosis and demonstrated similar procedural safety and mid-term stroke outcomes between the two modalities[9].

An important advantage of carotid stenting is its minimally invasive nature. For patients concerned about a cervical incision, visible scarring or the risk of cranial nerve injury associated with open surgery, endovascular treatment offers an effective alternative, with reduced risk of cranial nerve palsy, wound complications and cervical haematoma—considerations that are particularly relevant in asymptomatic patients, where procedural morbidity must be minimised.

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## CREST-2 and contemporary evidence

The CREST-2 trial was designed to address a critical unresolved question: whether carotid revascularisation combined with intensive medical management provides incremental benefit over intensive medical therapy alone in patients with high-grade asymptomatic carotid stenosis. The study consists of two parallel randomised comparisons: carotid endarterectomy plus medical therapy versus medical therapy alone, and carotid artery stenting plus medical therapy versus medical therapy alone.

Emerging results from CREST-2 have demonstrated that carotid stenting combined with intensive medical management is associated with a reduction in four-year stroke risk compared with intensive medical therapy alone[14]. At the same follow-up interval, carotid endarterectomy did not demonstrate a statistically significant incremental benefit over medical therapy alone, although peri-procedural outcomes for both interventions remained within accepted safety thresholds.

These findings reinforce several key principles. Contemporary carotid intervention—particularly stenting—can be delivered with very low peri-procedural stroke and death rates in experienced centres. Patient selection remains critical, and the benefit of intervention appears greatest when revascularisation is combined with optimal medical therapy in appropriately selected individuals. Editorial commentary accompanying CREST-2 has emphasised the importance of individualised, risk-stratified management rather than a uniform approach to all patients with asymptomatic carotid disease[15].

## Patient selection and shared decision-making

Not all patients with asymptomatic carotid stenosis require intervention. Referral for specialist vascular assessment is appropriate for patients with moderate to severe stenosis, particularly ≥70%, or where there is diagnostic or management uncertainty.

Factors supporting consideration of revascularisation include high-grade stenosis, disease progression on serial imaging, low estimated procedural risk, reasonable life expectancy and patient preference following informed discussion. Shared decision-making is central, particularly in asymptomatic patients, where the balance between long-term stroke prevention and procedural risk must be carefully considered.

## Conclusion

The management of asymptomatic carotid disease continues to evolve. Historical trials established the long-term stroke prevention benefit of carotid endarterectomy, while contemporary studies have demonstrated the safety and efficacy of modern carotid stenting. Recent data from CREST-2 provide important evidence supporting carotid intervention—particularly stenting—in carefully selected patients when combined with intensive medical therapy.

Early identification, appropriate referral and collaborative decision-making between general practitioners and vascular specialists remain central to optimising outcomes for patients with asymptomatic carotid stenosis.

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