

Stable coronary artery disease

When designing coronary artery disease (CAD) services, consider the following interventions as ways to achieve specific productivity improvements whilst maintaining the quality and safety of clinical care. This approach is being trialled as a beta product alongside the Map of Medicine Stable angina pathway, which covers all areas of a patient's care journey.

Diagnostic investigations for stable CAD

Coronary angiography

Do not perform further investigations to diagnose CAD, eg coronary angiography, in patients with an estimated likelihood of CAD greater than 90%.¹

If people have features of typical angina based on clinical assessment and their estimated likelihood of CAD is greater than 90%, further diagnostic investigation is unnecessary – manage as angina.¹

Offer invasive coronary angiography as the first-line diagnostic investigation for patients with estimated CAD risk of 60-90%.¹

Health economic modelling by the National Institute for Health and Clinical Excellence (NICE) demonstrated that when the estimated likelihood of CAD is 60-90%, the most cost-effective strategy for investigation is invasive coronary angiography.¹

Exercise ECG testing

Do not use exercise ECG testing as a first-line diagnostic investigation in patients with chest pain and no prior history of CAD.¹

Health economic modelling by NICE indicated that exercise ECG is only cost-effective as a first-line investigation strategy when the estimated likelihood of a patient having CAD is 5% or less.¹ Even in this instance, replacing exercise ECG with calcium scoring is likely to improve effectiveness at a reasonable level of additional cost.¹ NICE no longer recommend the use of exercise ECG as a first-line diagnostic test to investigate patients without pre-existing cardiac disease who present with new onset chest pain.¹

Calcium scoring

Offer calcium scoring as a first-line testing strategy in patients with estimated CAD risk of 10-29%.¹

The use of calcium scoring as a first-line testing strategy is cost-effective and should be followed by either 64-slice CT coronary angiography alone or with additional invasive coronary angiography.¹

Secondary prevention

Angiotensin-converting enzyme (ACE) inhibitor therapy

Initiate ACE inhibitor therapy with the lowest-cost generic version.²

There are generic versions available for some of the ACE inhibitors that are less costly than branded ACE inhibitors, but equally as effective. The volume of prescribing of ACE inhibitors is increasing significantly.² Expenditure in primary care in England on medications affecting the renin-angiotensin system currently stands at over £400 million per year. Prescribing generic rather than branded ACE inhibitors can be more cost-effective.²

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ACE inhibitors in CAD

Consider prescribing an ACE inhibitor in all people with stable CAD.³

The European trial on Reduction Of cardiac events with Perindopril in stable coronary Artery disease (EUROPA) showed that the use of perindopril 8mg once daily in patients with stable CAD resulted in a 20% relative risk reduction in the primary end point of cardiovascular death, myocardial infarction or cardiac arrest.³ An economic evaluation by Briggs et al (2006) found the median incremental cost per quality adjusted life year (QALY) gained with perindopril over placebo was £9700, and concluded that perindopril in patients with stable CAD was cost-effective when compared with placebo.³

Antiplatelet therapy following percutaneous coronary intervention (PCI)

Do not prescribe clopidogrel for longer than 12 months post-stent insertion in people who have undergone PCI.⁴

A meta-analysis of randomised controlled trials by Bowry et al (2008) found that in patients who have undergone PCI, the combination of aspirin plus clopidogrel reduces the frequency of major coronary events compared with aspirin alone.⁵ An economic evaluation by Cheng et al (2007) showed clopidogrel to be cost-effective when used for up to 12 months in combination with aspirin in patients undergoing PCI.⁴ The median incremental cost per QALY gained was £18,888.⁴

Statins in stable CAD

Do not initiate therapy with a high intensity statin for secondary prevention in people with stable CAD.⁶

Health economic modelling by NICE demonstrated that the use of high intensity statins for secondary prevention in people with CAD resulted in fewer cardiovascular events but was not cost-effective when compared with low intensity statin therapy.⁶

Revascularisation procedures

Comparing revascularisation procedures

Consider PCI with bare metal stents as the first-line intervention for revascularisation for stable patients with multi-vessel coronary disease (MVD).⁷

A Canadian economic evaluation by Wang et al (2006) assessed the clinical and cost-effectiveness of four different revascularisation procedures (PCI with bare metal stents (BMS), and PCI with drug eluting stents (DES), off-pump coronary artery bypass grafting (CABG), on-pump CABG,) for stable patients with multi-vessel CAD. The one-year clinical event rate was 9.8% for PCI with BMS and for PCI with DES, 9.6% for off-pump CABG, and 12.4% for on-pump CABG. Total expected costs were C\$10,555 (approx. £6,200 as of January 2006) for BMS, C\$13,827 (approx. £6,800 as of January 2006) for DES, C\$13,395 (approx. £6,600 as of January 2006) for off-pump CABG, and C\$15,103 (approx. £7,400 as of January 2006) for on-pump CABG. The cost-effectiveness analysis concluded that revascularisation using PCI with BMS was the least costly option for a population of stable CAD with MVD.⁷

Bare metal stents (BMS) versus drug eluting stents (DES) for PCI

Do not use DES for patients undergoing revascularisation with PCI.⁸

A Canadian economic evaluation by Goeree et al (2009) assessed the cost-effectiveness of DES compared with BMS. The two-year costs were C\$3,888 (approx. £2,200 as of January 2009) per patient with DES and C\$2,154 (approx. £1,200 as of January 2009) with BMS. The incremental cost per avoided revascularisation with DES compared with BMS was C\$52,585 (approx. £30,000 as of January 2009), while the incremental cost per QALY gained was C\$1,569,875 (approx. £900,000 as of January 2009). The cost-effectiveness analysis concluded that DES were not cost-effective compared with BMS for patients undergoing revascularisation with PCI.

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Key dates

The Map of Medicine systematically monitors the medical literature for the latest productivity interventions and will update this document as new evidence emerges.

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Methodology

The productivity considerations presented in this document are relevant to the UK. They were identified by systematically searching for and appraising productivity evidence from multiple sources, including NICE guidance, health economic databases and Zynx Health (a sister company of Map of Medicine).

A productivity message explicitly states interventions that can reduce the cost of care, whilst maintaining or improving patient outcomes. Actions that are believed to lead to improved productivity, but lack unequivocal clinical or economic evidence, are not included.

Some productivity considerations are informed by more recent evidence than that included in relevant national guidelines.

The document has been peer reviewed by an independent group of experts.

Feedback

This approach to productivity guidance is being trialled as a beta product alongside the Map of Medicine Stable angina pathway. We welcome your feedback. If you know of additional resources that describe cost-effective interventions, please forward the reference information to us at productivity@mapofmedicine.com.

Other topics of interest:

Productivity considerations for service design – [Cardiovascular disease risk management](#)

Productivity considerations for service design – [Diabetes](#)

Productivity considerations for service design – [Stroke and transient ischaemic attack \(TIA\)](#)

References

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3. Briggs A, Mihaylova B, Sculpher M et al. [Cost-effectiveness of perindopril in reducing cardiovascular events in patients with stable coronary artery disease using data from the EUROPA study](#). *Heart* 2007; 93: 1081-86.
4. Cheng W. [Pharmacoeconomic analysis of clopidogrel in secondary prevention of coronary artery disease](#). *J Manag Care Pharm* 2007; 13: 326-36.
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6. National Collaborating Centre for Primary Care (NCC-PC). [Lipid Modification: cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease](#). London: Royal College of General Practitioners (RCGP); 2008.
7. Wang X, Rokoss M, Dyub A et al. [Cost comparison of four revascularisation procedures for the treatment of multi-vessel coronary artery disease](#). *J Med Econ* 2008; 11: 119-34.
8. Goeree R, Bowen J, Blackhouse G et al. [Economic evaluation of drug-eluting stents compared to bare metal stents using a large prospective study in Ontario](#). *Int J Technol Assess Health Care* 2009; 25: 196-207.

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This document is not to be substituted for a healthcare professional's diagnosis or clinical decisions.