

The New European Society of Cardiology Guidelines on Myocardial Revascularisation

An Appraisal



Sjoerd T Nauta; Marcia Gaspersz; Jaap W Deckers

Posted: 01/11/2012; Heart. 2012;98(1):11-14. © 2012 BMJ Publishing Group Ltd & British Cardiovascular Society

Abstract and Introduction

Abstract

The latest European Society of Cardiology (ESC) guidelines on myocardial revascularisation are reviewed. The nearly 300 recommendations make it difficult to apply them in their totality. The authors would propose 20–30 recommendations per guideline based on sound clinical evidence. Also, the scope of the current guidelines is very wide as it includes topics already incorporated in other guidelines, such as strategies for pre-intervention diagnosis and imaging as well as on secondary prevention. Some recommendations in the new guidelines are sensible and will not be disputed. In particular, the encouragement of a balanced multidisciplinary decision process (the 'heart team') is welcome. Although coronary revascularisation in unstable high risk patients is well accepted, this is less the case for the low risk patient with chest pain. This issue is controversial and a balanced discussion of the pros and cons of percutaneous coronary intervention is missing. Despite convincing evidence indicating lack of benefit of percutaneous coronary intervention for chronic total occlusion, this procedure is not discouraged. Lastly, most committee members were interventional cardiologists or cardiac surgeons. Guideline committees should be representative of the whole group of professionals as the interpretation of the evidence by specialists may be biased. There may be a role for procedure oriented guidelines but, in that case, the items at issue should remain confined to matters directly related to technical aspects of the procedure

Introduction

Guidelines describe the current state of the art by formulating the current evidence base and recommendations for their application in clinical practice. On the basis of this premise, we reviewed the latest European Society of Cardiology (ESC) guidelines on myocardial revascularisation.^[1] The new document is a follow-up on the percutaneous coronary intervention (PCI) guidelines from 2005, which have previously been discussed in this journal.^[2–3] The current document is a joint effort by interventional cardiologist as well as cardiovascular surgeons, and thus considers both percutaneous and surgical revascularisation modalities. As a consequence, a 'heart team,' a more formal multidisciplinary team approach to coronary revascularisation, is advocated. As such, the new approach goes a long way towards establishing a sound basis for clinical decision making for patients with coronary insufficiency, and we—and others before us—have no doubt that it will fulfil that purpose.^[4] Nevertheless, some topics covered in the guidelines require clarification. In this review, we comment on those topics with the aim of improving future versions of such documents.

Specific Issues

Scope of the Guidelines

The new guidelines, which comprise 13 sections, provide recommendations for percutaneous as well as surgical revascularisations. In reality, however, it goes further. For instance, the various strategies for pre-intervention diagnosis and imaging are also included (chapter 5). A useful chapter without doubt, but we question the appropriateness of including this issue in this procedure oriented document. This is relevant as the worth of diagnostic tests has previously been described in the ESC guidelines on stable angina.^[5] Similarly, chapter 13 of the current guidelines provides recommendations for secondary prevention. That subject has been covered extensively in the guidelines on CVD prevention.^[6] The reader is thus left with the question of where these topics will be covered in future versions of these guidelines, and if the recommendations are different, which ones are to be followed. The scope of the current new guidelines is thus too wide.

Number and Levels of Recommendations

The new guidelines are quite lengthy but, with 52 pages, not extraordinarily so. However, the nearly 300 recommendations (Table 1) make it almost impossible to apply them in their totality.^[7]

Table 1. Summary of recommendations in the new European Society of Cardiology guidelines on coronary revascularisation

Class*	Level[†]	No of recommendations per level	No of recommendations per class
I	A	53	144
I	B	48	
I	C	43	
IIa	A	8	59
IIa	B	38	
IIa	C	13	
IIb	A	3	39
IIb	B	18	
IIb	C	18	
III	A	12	45
III	B	23	
III	C	10	

*Class of recommendation.

†Level of evidence.

We are of the opinion that IA ('strongly recommended') and IIIA ('strongly discouraged') recommendations should be issued only in the context of relevant changes in clinical outcomes resulting from performing (or withholding) specific interventions that were rigorously scrutinised and tested, preferably in randomised clinical trials. Unfortunately, this view was not taken by the current committee, with a very large number of recommendations based on 'expert opinion' as a result. Leaving out such assessments would not only go a long way towards strengthening the value of the recommendations based on sound clinical evidence but, in addition, would make it much easier to apply the guidelines in clinical practice. We also believe that some of the current recommendations are not appropriate or incorrect. For instance, the stratification scores used to estimate periprocedural intervention risks (chapter 4, table 3) have been given specific recommendations. However, we are unaware of any studies that have shown that actual patient outcome will improve as a result of the use of such scores and levels of recommendations are thus not applicable. The same is true for many other recommendations. For instance, the recommendations depicted in table 7 (chapter 5), which compare the value of different imaging techniques in (sub) groups of patients, are not based on studies in which these techniques were directly compared with each other.

However, most recommendations in the new guidelines are quite sound and will not lead to much controversy. For instance, mechanical PCI of the infarct related vessel as early as possible in ST segment elevation myocardial infarction, the preference for surgical revascularisation intervention in the case of multivessel disease, poor left ventricular function or diabetes, appropriate risk stratification and revascularisation in patients with unstable clinical conditions, as well as physiological assessment of the importance of intermediate coronary lesions prior to intervention, all seem very appropriate and sound. In particular, the encouragement of a balanced multidisciplinary decision process ('heart team') is a very welcome addition, which was given appropriate credit in a recent editorial by Taggart *et al* in this journal.^[4]

PCI in Stable Angina and Chronic Total Occlusion

Although in suitable high risk patients coronary revascularisation in unstable clinical conditions is generally well accepted, this is not true for low risk patients with stable chest pain. This is a controversial issue and, given the large number of procedures performed for this indication, not without reason. This topic is covered in chapter 6, and the reader would expect a concise but objective textual review of this subject. This section is, however, quite short and does not provide such an evaluation. However, from review of tables 8 and 9 in this chapter, it becomes clear that the authors do recommend PCI for this indication, with a (noteworthy) class IC (expert opinion) indication for one or two vessel disease not involving the proximal left anterior

descending. Although the lack of references given for this recommendation is in line with the given C, the results of the randomised trials performed in these patients do not support this recommendation (see below). The table gives a IIa B recommendation for PCI when the proximal left anterior descending is involved. This recommendation is based on two meta-analyses and two other studies comparing coronary artery bypass grafting with PCI and are therefore not applicable. In fact, all but two references in this table compare the results of PCI with surgical revascularisation, and therefore do not address the issue of medical therapy versus PCI.

We realise that an objective assessment of the appropriateness of PCI in stable angina is not easy and is confounded by specific issues. Observational data showing the superiority of revascularisation over medical treatment are not helpful because of significant treatment bias^[8] and—unfortunately—the actual evidence base is quite small.

A summary of all randomised controlled clinical trials comparing PCI with medical therapy for stable angina is given in Table 2 and figure 1. This analysis differs from previous analyses because we have excluded trials performed in the early 1990s.^[18–22] In that era, medical treatment was more or less placebo: for instance, statins and ACE inhibitors—currently considered standard medical treatment—were not available or not used. In addition, we excluded trials that investigated early post-myocardial infarction patients.^[23–27] Overall, the combined results of these trials provide limited evidence for the superiority of PCI over medical therapy in stable chest pain syndromes. Of course, we acknowledge that some of these trials have come under criticism, and that patients switched from medical treatment to PCI (or coronary artery bypass graft) (typically in about 25%). On the other hand, all subjects considered in these trials qualified for intervention on the basis of their specific coronary anatomy and were therefore quite selected. This is different from the practical situation in which the patient with chest pain but with unknown coronary anatomy is contemplated. In the latter situation, eligibility for revascularisation (and PCI) is uncertain, and a considerable number of such patients will not be eligible for such a procedure because of anatomical or other circumstances. For instance, in the ICTUS trial, which investigated the possible benefit of revascularisation in subjects with unstable angina, less than 60% of the patients scheduled to undergo intervention actually qualified for subsequent revascularisation.^[8] Thus, in the depicted trials, the true effectiveness of PCI in clinical practice may well have been exaggerated, and one could argue that, given their specific eligibility criteria, the randomised trials overestimated the true worth of PCI. Against this background, a balanced discussion of the pro and cons of PCI in this setting would have been helpful in the guidelines. It is unreasonable to base a positive recommendation for PCI on the basis of results obtained in a subgroup of a subgroup of the (overall negative) COURAGE trial: an 'evidence base' of 100 patients does not meet the criteria to justify millions of costly invasive procedures of uncertain clinical benefit.^[8 28] A strategy of initial medical treatment is certainly the preferable option for the low risk patient with stable angina or in someone in whom the presence of obstructive coronary artery disease has just been established during diagnostic coronary angiography.

Table 2. Characteristics of randomised clinical trials comparing percutaneous coronary intervention with medical treatment

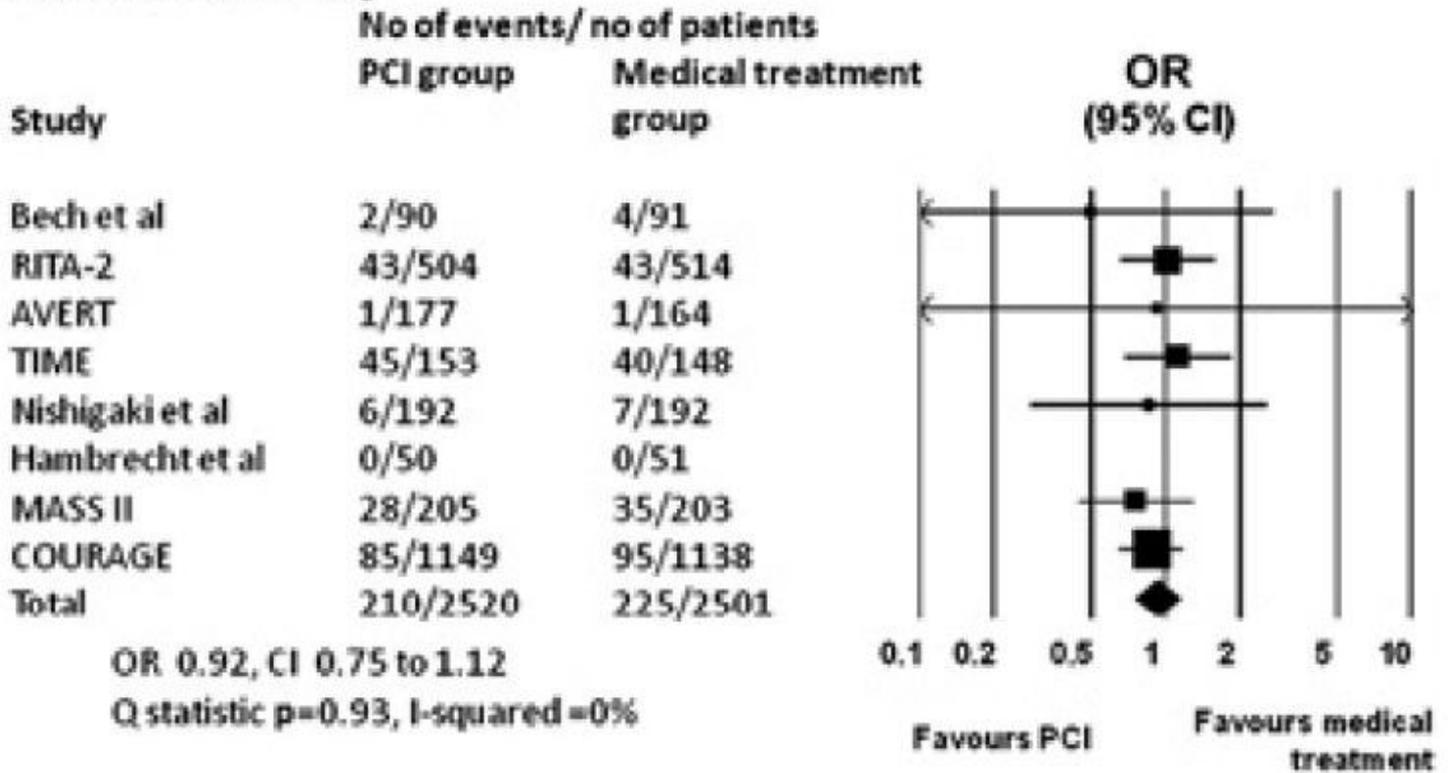
Trial	Year of most recent publication	Enrolment period	Total No of patients	Non-protocol revascularisations in medical group (%)	Follow-up length (months)	Statin use at baseline (%)
AVERT ⁹	1999	1995–1996	341	12	20	22
Bech <i>et al</i> ¹⁰	2001	NR	181	7	24	37
RITA 2 ¹¹	2003	1992–1996	1018	35	84	13
TIME ¹²	2004	1996–2000	301	42	48	23
Hambrecht <i>et al</i> ¹³	2004	1997–2001	101	6	12	75
MASS II ¹⁴	2006	1995–2000	408	24	60	NR
COURAGE ¹⁵	2007	1991–2004	2287	31	54	88

Nishigaki et al ¹⁶	2008	2002–2004	384	37	26	47
-------------------------------	------	-----------	-----	----	----	----

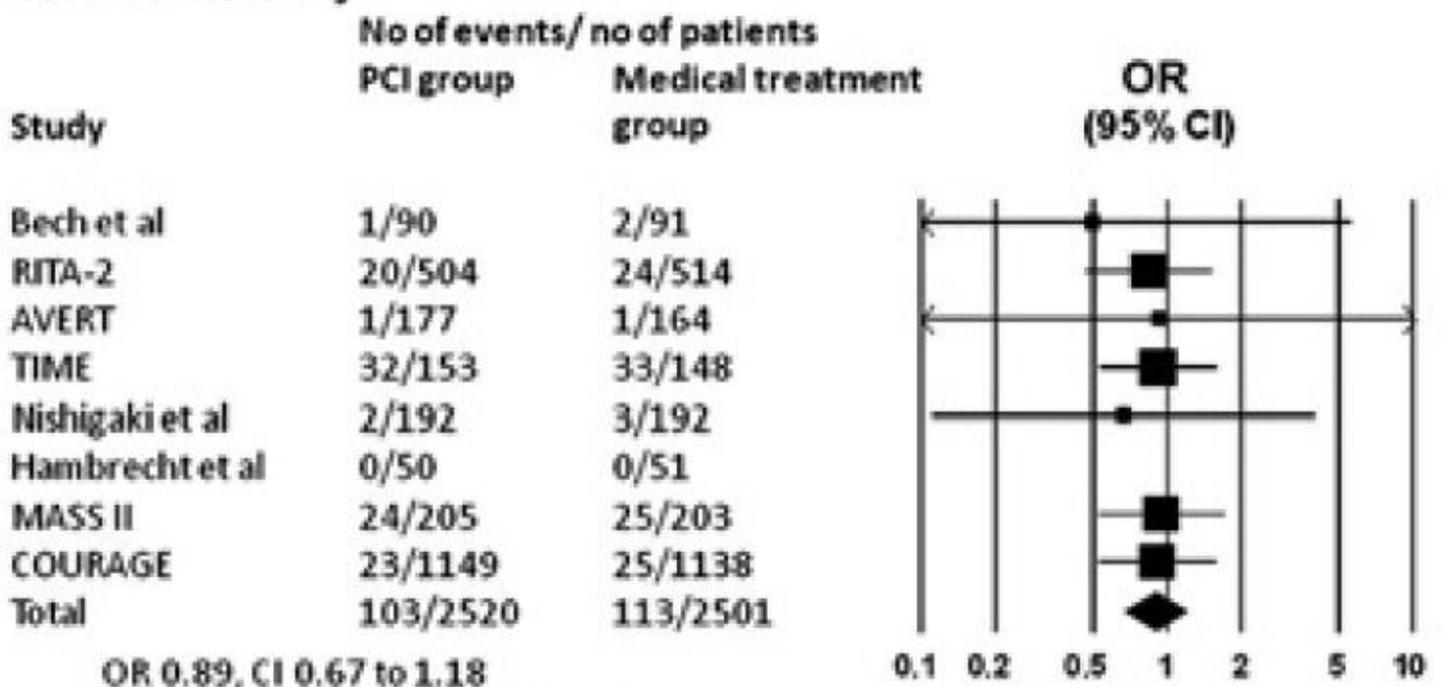
NR, not reported.

Medscape

All cause mortality



Cardiac mortality



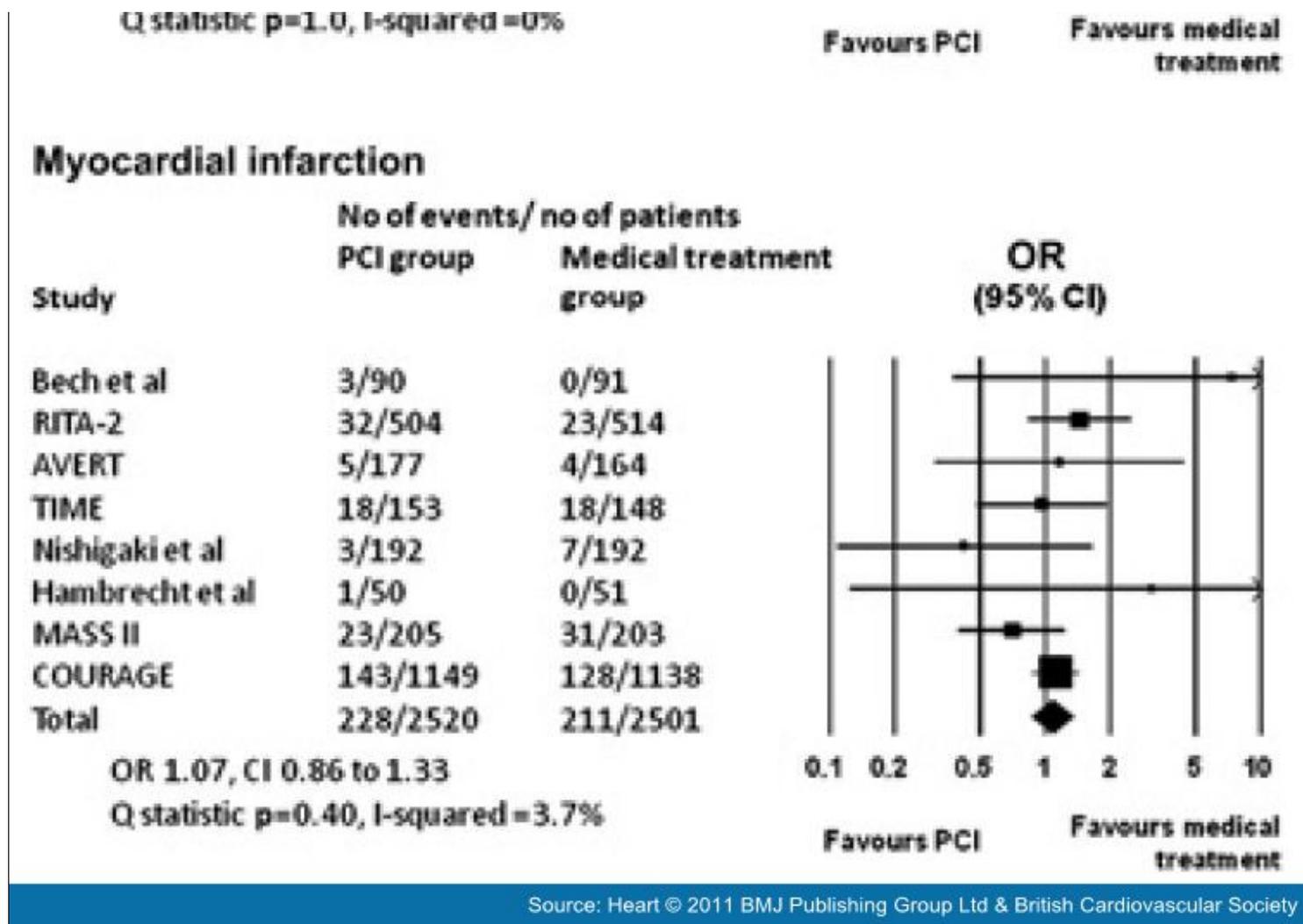


Figure 1. Percutaneous coronary intervention (PCI) versus medical treatment in stable angina. For each trial we calculated the summary ORs and 95% CIs for the clinical outcomes. We pooled studies using random effects models.¹⁷

It is also noteworthy that, despite two negative randomised trials that specifically addressed this topic, the performance of percutaneous intervention for chronic total occlusion is not discouraged. Instead, an 'experienced' intervention team is called to order, perhaps suggesting that the care was substandard in the trials that investigated this very issue.

General Issues

Format of the Guidelines and Composition of the Writing Committee

The current format of the guidelines differs significantly from the previous version, and this makes it difficult to assess why, and on the basis of what information, the current recommendations have changed from those issued in the earlier document. We recommend that future versions of the guidelines be based on and, where necessary, expand on previous versions.

Specific to these guidelines, we have noted that the majority of the current committee members (and reviewers) were interventional cardiologists or cardiac surgeons. By contrast, other guideline development groups (such as NICE) also include other stakeholders, such as primary care physicians, nurses, health economists, epidemiologists, cardiac radiologists, patient members and pharmacists (Timmis A. *et al* Stable angina: full guideline. 2011. <http://www.nice.org.uk>). Guideline committees should be representative of the whole group of professionals and stakeholders as it is likely that the interpretation of the evidence by specialists will be biased. There may be some role or place for procedure oriented guidelines but, in that case, the items at issue should remain confined to matters directly related to technical aspects of the actual procedure.

Regarding the number of recommendations, we believe that 20–30 sound recommendations would be a reasonable number per guideline, in view of our earlier comments and given the low number of recommendations based on high quality clinical

data; this should not be too difficult. A summary of our recommendations is given in box 1, and we hope that these will be helpful in developing future versions of the current as well as upcoming guidelines.

Box 1 Summary of our comments and suggestions

- Medical treatment should be the initial management of the patient with stable chest pain. Strong recommendation, high quality data (class IA).
- Percutaneous opening of a chronic total coronary occlusion is not recommended. High quality data (class IIIA).
- The composition of the guideline committee must be representative of the profession at large.
- The number of recommendations per guideline should be limited (eg, between 20 and 30), and be based on sound (high quality) clinical evidence.
- As a rule, recommendations based on opinion are not very useful and should be avoided. This pertains to most class II recommendations.
- The scope of the guidelines must not be too wide.
- New versions of guidelines must build on and expand on previous versions, and relevant changes in recommendations must be addressed specifically.

References

1. Wijns W, Kolh P, Danchin N, *et al*; European Association for Percutaneous Cardiovascular Interventions. Guidelines on myocardial revascularization: The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS). *Eur Heart J* 2010;31:2501–55.
2. Fox KA. COURAGE to change practice? Revascularisation in patients with stable coronary artery disease. *Heart* 2009;95:689–92.
3. Curzen NP. Is there evidence for prognostic benefit following PCI in stable patients? COURAGE and its implications: an interventionalist's view. *Heart* 2010;96:103–5.
4. Taggart DP, Boyle R, de Belder MA, *et al*. The 2010 ESC/EACTS guidelines on myocardial revascularisation. *Heart* 2011;97:445–6.
5. Fox K, Garcia MA, Ardissino D, *et al*; Task Force on the Management of Stable Angina Pectoris of the European Society of Cardiology; ESC Committee for Practice Guidelines (CPG). Guidelines on the management of stable angina pectoris: executive summary: The Task Force on the Management of Stable Angina Pectoris of the European Society of Cardiology. *Eur Heart J* 2006;27:1341–81.
6. Graham I, Atar D, Borch-Johnsen K, *et al*; European Society of Cardiology (ESC) Committee for Practice Guidelines (CPG). European guidelines on cardiovascular disease prevention in clinical practice: executive summary: Fourth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of nine societies and by invited experts). *Eur Heart J* 2007;28:2375–414.
7. Tricoci P, Allen JM, Kramer JM, *et al*. Scientific evidence underlying the ACC/AHA clinical practice guidelines. *JAMA* 2009;301:831–41.
8. Hirsch A, Windhausen F, Tijssen JG, *et al*; Invasive versus Conservative Treatment in Unstable coronary Syndromes Investigators. Diverging associations of an intended early invasive strategy compared with actual revascularization, and outcome in patients with non-ST-segment elevation acute coronary syndrome: the problem of treatment selection bias. *Eur Heart J* 2009;30:645–54.
9. Pitt B, Waters D, Brown WV, *et al*. Aggressive lipid-lowering therapy compared with angioplasty in stable coronary artery disease. Atorvastatin versus Revascularization Treatment Investigators. *N Engl J Med* 1999;341:70–6.
10. Bech GJ, De Bruyne B, Pijls NH, *et al*. Fractional flow reserve to determine the appropriateness of angioplasty in moderate coronary stenosis: a randomized trial. *Circulation* 2001;103:2928–34.
11. Henderson RA, Pocock SJ, Clayton TC, *et al*; Second Randomized Intervention Treatment of Angina (RITA-2) Trial Participants. Seven-year outcome in the RITA-2 trial: coronary angioplasty versus medical therapy. *J Am Coll Cardiol* 2003;42:1161–70.
12. Pfisterer M; Trial of Invasive versus Medical therapy in Elderly patients Investigators. Long-term outcome in elderly patients with chronic angina managed invasively versus by optimized medical therapy: four-year follow-up of the randomized Trial of Invasive versus Medical therapy in Elderly patients (TIME). *Circulation* 2004;110:1213–18.
13. Hambrecht R, Walther C, Mobius-Winkler S, *et al*. Percutaneous coronary angioplasty compared with exercise training in

- patients with stable coronary artery disease: a randomized trial. *Circulation* 2004;109:1371–8.
14. Soares PR, Hueb WA, Lemos PA, *et al*. Coronary revascularization (surgical or percutaneous) decreases mortality after the first year in diabetic subjects but not in nondiabetic subjects with multivessel disease: an analysis from the Medicine, Angioplasty, or Surgery Study (MASS II). *Circulation* 2006;114(1 Suppl):I420–4.
 15. Boden WE, O'Rourke RA, Teo KK, *et al*; COURAGE Trial Research Group. Optimal medical therapy with or without PCI for stable coronary disease. *N Engl J Med* 2007;356:1503–16.
 16. Nishigaki K, Yamazaki T, Kitabatake A, *et al*; Japanese Stable Angina Pectoris Study Investigators. Percutaneous coronary intervention plus medical therapy reduces the incidence of acute coronary syndrome more effectively than initial medical therapy only among patients with low-risk coronary artery disease a randomized, comparative, multicenter study. *JACC Cardiovasc Interv* 2008;1:469–79.
 17. DerSimonian R, Laird N. Meta-analysis in clinical trials. *Control Clin Trials* 1986;7:177–88.
 18. Davies RF, Goldberg AD, Forman S, *et al*. Asymptomatic Cardiac Ischemia Pilot (ACIP) study two-year follow-up: outcomes of patients randomized to initial strategies of medical therapy versus revascularization. *Circulation* 1997;95:2037–43.
 19. Folland ED, Hartigan PM, Parisi AF. Percutaneous transluminal coronary angioplasty versus medical therapy for stable angina pectoris: outcomes for patients with doublevessel versus single-vessel coronary artery disease in a Veterans Affairs Cooperative randomized trial. Veterans Affairs ACME InvestigatorS. *J Am Coll Cardiol* 1997;29:1505–11.
 20. Hueb WA, Soares PR, Almeida De Oliveira S, *et al*. Five-year follow-up of the medicine, angioplasty, or surgery study (MASS): A prospective, randomized trial of medical therapy, balloon angioplasty, or bypass surgery for single proximal left anterior descending coronary artery stenosis. *Circulation* 1999;100(19 Suppl):II107–13.
 21. Schomig A, Mehilli J, de Waha A, *et al*. A meta-analysis of 17 randomized trials of a percutaneous coronary intervention-based strategy in patients with stable coronary artery disease. *J Am Coll Cardiol* 2008;52:894–904.
 22. Sievers N, Hamm CW, Herzner A, *et al*. Medical therapy versus PTCA: a prospective, randomized trial in patients with asymptomatic coronary single-vessel disease (abstr). *Circulation* 1993;I297.
 23. Dakik HA, Kleiman NS, Farmer JA, *et al*. Intensive medical therapy versus coronary angioplasty for suppression of myocardial ischemia in survivors of acute myocardial infarction: a prospective, randomized pilot study. *Circulation* 1998;98:2017–23.
 24. Erne P, Schoenenberger AW, Burckhardt D, *et al*. Effects of percutaneous coronary interventions in silent ischemia after myocardial infarction: the SWISSI II randomized controlled trial. *JAMA* 2007;297:1985–91.
 25. Madsen JK, Nielsen TT, Grande P, *et al*; DANAMI study group. Revascularization compared to medical treatment in patients with silent vs. symptomatic residual ischemia after thrombolized myocardial infarctionthe DANAMI study. *Cardiology* 2007;108:243–51.
 26. Mahmarian JJ, Dakik HA, Filipchuk NG, *et al*; INSPIRE Investigators. An initial strategy of intensive medical therapy is comparable to that of coronary revascularization for suppression of scintigraphic ischemia in high-risk but stable survivors of acute myocardial infarction. *J Am Coll Cardiol* 2006;48:2458–67.
 27. Zeymer U, Uebis R, Vogt A, *et al*. Randomized comparison of percutaneous transluminal coronary angioplasty and medical therapy in stable survivors of acute myocardial infarction with single vessel disease: a study of the Arbeitsgemeinschaft Leitende Kardiologische Krankenhausärzte. *Circulation* 2003;108:1324–8.
 28. Shaw LJ, Berman DS, Maron DJ, *et al*; COURAGE Investigators. Optimal medical therapy with or without percutaneous coronary intervention to reduce ischemic burden: results from the Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation (COURAGE) trial nuclear substudy. *Circulation* 2008;117:1283–91.

Competing interests

JWD was a member of the ESC Committee on Practice Guidelines from 2002 to 2006, and was the review coordinator of the (previous) PCI guideline.

Provenance and peer review

Not commissioned; internally peer reviewed.

Heart. 2012;98(1):11-14. © 2012 BMJ Publishing Group Ltd & British Cardiovascular Society

