



## Updates

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#### 'Ten commandments' for Myocardial Revascularization (2018 ESC/EACTS)

European Heart Journal (2019)  
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(1) *Objective evidence of myocardial ischaemia* by non-invasive stress imaging and/or intravascular assessment of the functional relevance of coronary artery stenosis are needed to indicate myocardial revascularization through PCI or CABG and to select the appropriate targets for PCI.

(2) *With large areas of inducible myocardial ischaemia* or relevant LV systolic dysfunction, myocardial revascularization through CABG or PCI is indicated to improve long-term survival.

(3) Myocardial revascularization is also indicated for *relief of symptoms* of myocardial ischaemia despite medical therapy optimized with respect for patient preferences.

(4) The prognostic and symptomatic benefit of myocardial revascularization critically depends on the *completeness of revascularization*. Therefore, the ability to achieve complete revascularization is a key issue when choosing the appropriate treatment modality.

(5) Apart from issues of individual operative risk and technical feasibility, diabetes mellitus, and anatomical complexity of coronary artery disease determine the relative benefits of PCI and CABG. *Diabetes mellitus and extensive coronary artery disease* are predictors of a long-term survival benefit of CABG.

(6) *The SYNTAX score* is the recommended tool to gauge the anatomical complexity of coronary disease.

(7) *Complex cases call for the Heart Team to be consulted* to develop individualized treatment concepts with respect for the preferences of the patient informed about early and late outcomes.

#### Extracts from guidelines

*From the Editorial desk*

(8) *Radial access is preferred* for any PCI irrespective of clinical presentation, unless there are over-riding procedural considerations.

(9) *Drug-eluting stents are recommended* for any PCI irrespective of clinical presentation, lesion type, and anticipated duration of dual antiplatelet therapy or concomitant anticoagulant therapy.

(10) *Multiple arterial grafting* should be performed using the radial artery for high-grade stenosis and/or bilateral internal mammary artery grafting for patients who do not have an increased risk for sternal wound infection.

#### New Guidelines for Evaluating, and managing Bradycardia

American College of Cardiology -Nov 06, 2018

Sleep disorders of breathing and nocturnal bradycardias are both relatively common. The 2018 guideline suggests that the presence of nocturnal bradycardias is not in itself an indication for permanent pacing, but rather an opportunity to screen for sleep apnea. However, "in patients with acquired second degree Mobitz type II AV block, high-grade AV block, or third-degree AV block not due to reversible or physiologic causes, permanent pacing is recommended regardless of symptoms." For all other types of AV blocks, the guideline recommends permanent pacing generally be considered only in the presence of symptoms that correlate with AV block. In sinus node dysfunction, establishing temporal correlation between symptoms and bradycardia is important when deciding on the necessity of permanent pacing.



## Choice between CABG and PCI in major categories of patients with stable multivessel coronary artery disease: the task force of the 2018 ESC/EACTS guidelines on myocardial revascularization

European Heart Journal (2019)

### Left main disease

While PCI of left main disease was regarded contraindicated during the balloon angioplasty era, the advent of stents led to several dedicated RCTs assessing PCI in the specific setting of patients with left main disease. Two recent RCTs compared PCI with the use of new generation DES and CABG in the specific setting of left main disease.

The EXCEL trial compared CABG with PCI using new generation DES [Everolimus-Eluting Stent (EES)] among 1905 patients with left main CAD with evidence of invasive or non-invasive ischaemia. Complex left main CAD defined as SYNTAX score of >32 constituted a formal exclusion criterion.

At 3 years of follow-up, the primary endpoint of death, stroke, or MI occurred with similar frequency in the CABG and PCI group [14.7% vs. 15.4%] without significant differences in the individual components. Repeat revascularization was less common with CABG than PCI (12.9% vs. 7.6%). The NOBLE trial compared CABG with PCI using new generation DES (Biolimus-Eluting Stent-BES) among 1201 patients with left main CAD (mean SYNTAX score of 23).

At a median follow-up of 3.1 years, the primary endpoint of death, non-procedural MI, stroke and repeat revascularization occurred more frequently in the PCI than CABG group (29% vs. 19%) While there were no differences in the incidence of all-cause and cardiac death, PCI was associated with a higher incidence of non-procedural MI (7% vs. 2%,  $P=0.004$ ) and repeat revascularization (16% vs. 10%,  $P=0.03$ ). The trial failed to demonstrate non-inferiority of PCI for the primary endpoint and CABG was found superior to PCI ( $P=0.0066$ ).

### Diabetes mellitus (DM)

Diabetes mellitus is not just a risk factor but rather a distinct disease entity that is critical for the selection between myocardial revascularization strategies in patients with multivessel disease.

Diabetes mellitus is associated with systemic endothelial dysfunction, accelerated atherosclerosis and more diffuse pattern of CAD. These disease properties are associated with a more pronounced progression of CAD after revascularization as well as neointimal hyperplastic response after PCI and may explain at least in part the differences in outcomes between CABG and PCI in patients with diabetes and multivessel CAD as compared to patients without diabetes.

The randomized BARI trial, comparing PCI with use of balloon angioplasty and CABG in selected patients with multivessel CAD, reported similar mortality for both revascularization strategies at 5 and 10 years.

Stratified analyses according to diabetes mellitus revealed improved survival among patients allocated to CABG compared with those allocated to PCI at 5 years and 10 years of follow-up. Conversely, In the SYNTAX trial stratified analyses of primary and secondary outcomes according to diabetic status did not reveal a relevant interaction although event rates were consistently higher among patients with diabetes.

In the Future Revascularization Evaluation in Patients with Diabetes Mellitus: Optimal Management of Multivessel Disease (FREEDOM) trial, the largest randomized study in diabetics, PCI with use of early-generation DES was compared with CABG in diabetic patients undergoing elective revascularization for multivessel CAD.

Out of a total of 33 966 patients screened, 1900 patients (6%) with a mean SYNTAX score of  $26 \pm 9$  were enrolled. During 5-year follow up, CABG significantly reduced the risk of the primary endpoint death, MI, or stroke compared with PCI.

Thus, based on current evidence diabetes mellitus is the strongest predictor of a survival benefit of CABG as compared with PCI in patients with multivessel CAD. Particularly, in patients with intermediate or high SYNTAX scores this survival benefit is substantial and considerably more pronounced than in the absence of diabetes.



Only with low SYNTAX score it may be justified to consider PCI as an alternative to CABG.

## Updates

Myocardial revascularization as adjunct to guideline-based medical therapy remains the mainstay in the treatment of patients with symptomatic or ischaemia-producing CAD. Patients with left main and multivessel CAD require individual decision making by the local Heart Team guided by assessment of the operative risk, complexity of the underlying CAD, and likelihood to achieve complete revascularization. The choice between PCI and CABG is made by carefully weighing the benefits and risks inherent to the respective revascularization technique as well as local expertise. The SYNTAX score remains the best tool to guide decisions on the revascularization strategy among patients with multivessel CAD complemented by considerations in the presence of left main CAD and diabetes.