

2022



# Valoración No invasiva en el SCC.

## Probabilidad pre test

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30.06.2022



2022

## Conflictos de interés:

-Speaker: Boehringer-Ingelheim, Quimfa, Sanofi, Novo Nordisk.

2022

# 2019 ESC Guidelines on the diagnosis and management of chronic coronary syndromes



## What is new in the 2019 Guidelines?

### New/revised concepts (1)

The Guidelines have been revised to focus on CCS instead of stable CAD.

This change emphasizes the fact that the clinical presentations of CAD can be categorized as either ACS or CCS.

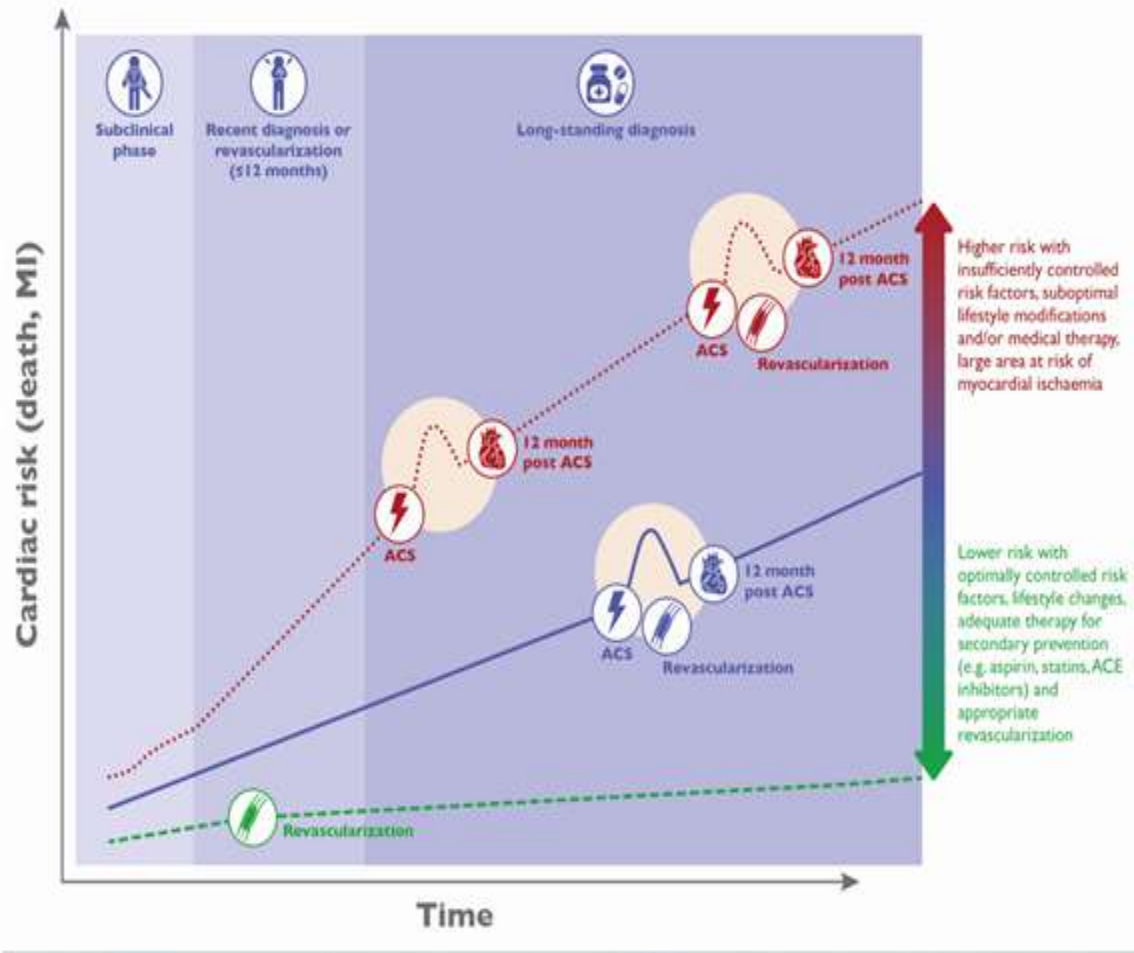
In the current Guidelines on CCS, six clinical scenarios most frequently encountered in patients are identified:

- (i) patients with suspected CAD and 'stable' anginal symptoms, and/or dyspnoea;
- (ii) patients with new onset of HF or LV dysfunction and suspected CAD;
- (iii) asymptomatic and symptomatic patients with stabilized symptoms <1 year after an ACS or patients with recent revascularization;
- (iv) asymptomatic and symptomatic patients >1 year after initial diagnosis or revascularization;
- (v) patients with angina and suspected vasospastic or microvascular disease;
- (vi) asymptomatic subjects in whom CAD is detected at screening.

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# Natural history of chronic coronary syndromes

A dynamic process



[www.escardio.org/guidelines](http://www.escardio.org/guidelines)

ESC Guidelines on the diagnosis and management of chronic coronary syndromes  
(European Heart Journal 2019; 10.1093/eurheartj/ehz425)

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# Patients with angina and/or dyspnoea and suspected coronary artery disease

## Clinical classification of suspected angina

Typical angina	Meets the following three characteristics: <ol style="list-style-type: none"> <li>1. Constricting discomfort in the front of the chest or in the neck, jaw, shoulder, or arm;</li> <li>2. Precipitated by physical exertion;</li> <li>3. Relieved by rest or nitrates within 5 min.</li> </ol>
Atypical angina	Meets two of these characteristics.
Non-anginal chest pain	Meets only one or none of these characteristics.

## Patients with angina and/or dyspnoea and suspected coronary artery disease

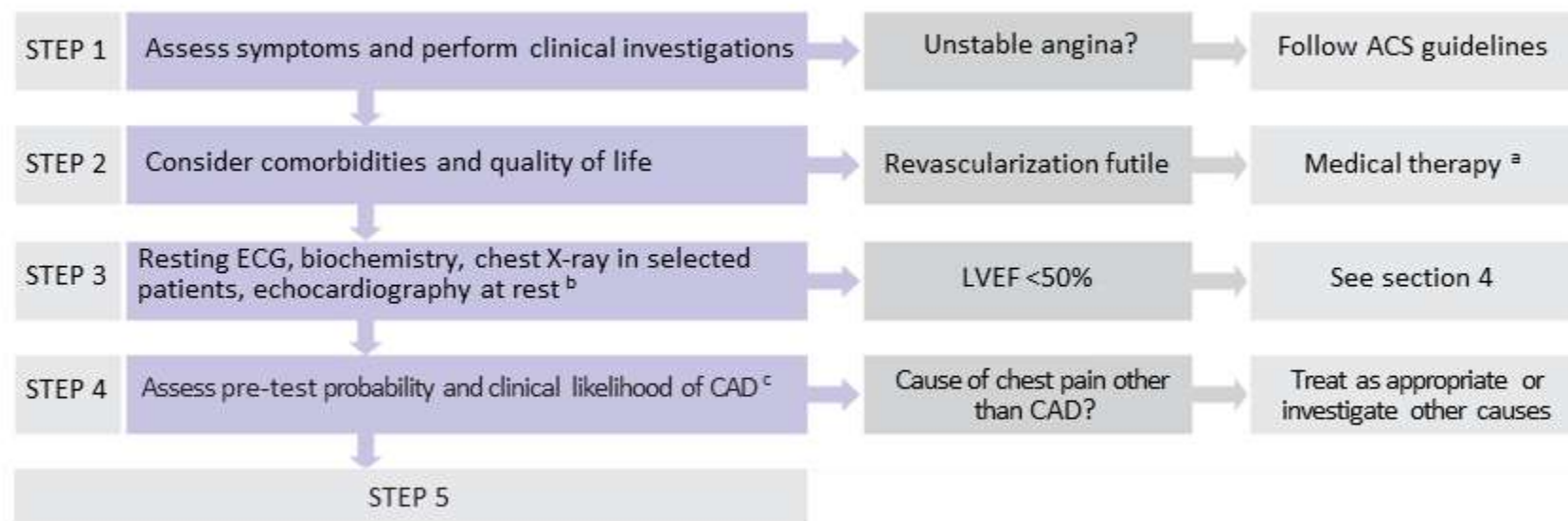
### Canadian Cardiovascular Society grading of effort angina severity

Class	Description of angina severity	
<b>I</b>	Angina only with strenuous exertion	Presence of angina during strenuous, rapid, or prolonged ordinary activity (walking or climbing the stairs).
<b>II</b>	Angina with moderate exertion	Slight limitation of ordinary activities when they are performed rapidly, after meals, in cold, in wind, under emotional stress, or during the first few hours after waking up, but also walking uphill, climbing more than one flight of ordinary stairs at a normal pace, and in normal conditions.
<b>III</b>	Angina with mild exertion	Having difficulties walking one or two blocks, or climbing one flight of stairs, at normal pace and conditions.
<b>IV</b>	Angina at rest	No exertion needed to trigger angina.

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# Patients with angina and/or dyspnoea and suspected coronary artery disease

## Diagnostic approach (1)



<sup>a</sup> If the diagnosis of CAD is uncertain, establishing a diagnosis using non-invasive functional imaging for myocardial ischaemia before treatment may be reasonable.

<sup>b</sup> May be omitted in very young and healthy patients with a high suspicion of an extracardiac cause of chest pain, and in multimorbid patients in whom the echocardiography result has no consequence for further patient management. <sup>c</sup> Consider exercise ECG to assess symptoms, arrhythmias, exercise tolerance, BP response, and event risk in selected patients.

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## Patients with angina and/or dyspnoea and suspected coronary artery disease

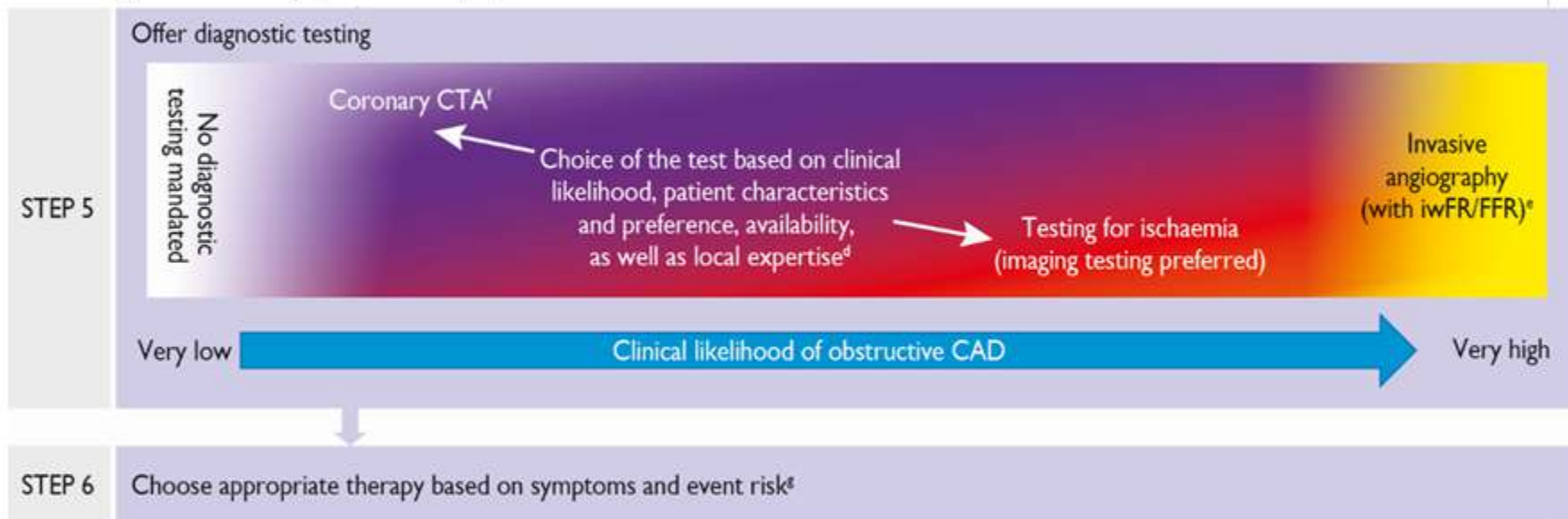
### Pre-test probability of coronary artery disease

Age	Typical		Atypical		Non-anginal		Dyspnoea <sup>a</sup>	
	M	W	M	W	M	W	M	W
30–39	3%	5%	4%	3%	1%	1%	0%	3%
40–49	22%	10%	10%	6%	3%	2%	12%	3%
50–59	32%	13%	17%	6%	11%	3%	20%	9%
60–69	44%	16%	26%	11%	22%	6%	27%	14%
70+	52%	27%	34%	19%	24%	10%	32%	12%

<sup>a</sup> In addition to the classic Diamond and Forrester classes, patients with dyspnoea only or dyspnoea as the primary symptom are included. The dark green shaded regions denote the groups in which non-invasive testing is most beneficial (pre-test probability >15%). The light green shaded regions denote the groups with pre-test probability of CAD between 5-15% in which the testing for diagnosis may be considered after assessing the overall clinical likelihood based on modifiers of pre-test probability.

# Patients with angina and/or dyspnoea and suspected coronary artery disease

## Diagnostic approach (2)



<sup>d</sup> Ability to exercise, individual test-related risks, and likelihood of obtaining diagnostic test result. <sup>e</sup> High clinical likelihood and symptoms inadequately responding to medical treatment, high event risk based on clinical evaluation (such as ST-segment depression, combined with symptoms at a low workload or systolic dysfunction indicating CAD), or uncertain diagnosis on non-invasive testing. <sup>f</sup> Functional imaging for myocardial ischaemia if coronary CTA has shown CAD of uncertain grade or is non-diagnostic. <sup>g</sup> Consider also angina without obstructive disease in the epicardial coronary arteries (see section 6 of full text).

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# *The* NEW ENGLAND JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

APRIL 2, 2015

VOL. 372 NO. 14

## Outcomes of Anatomical versus Functional Testing for Coronary Artery Disease

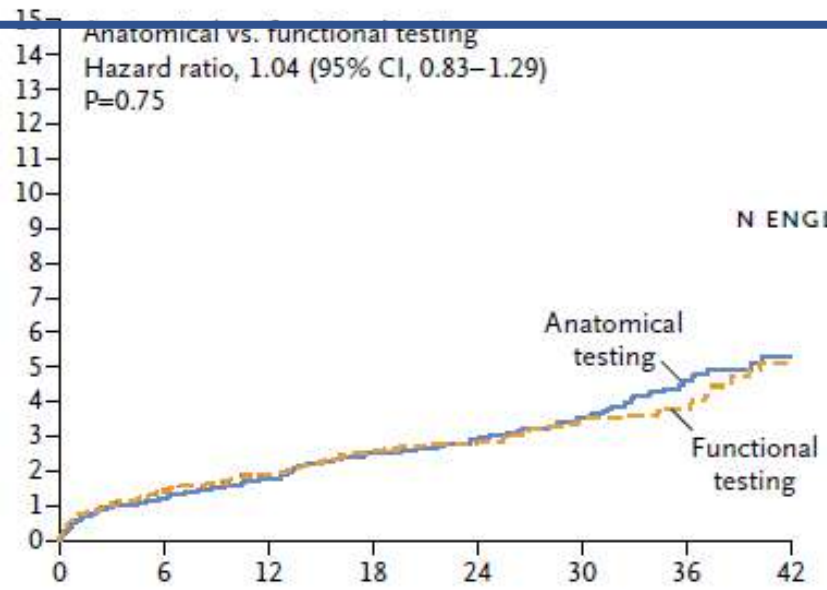
Pamela S. Douglas, M.D., Udo Hoffmann, M.D., M.P.H., Manesh R. Patel, M.D., Daniel B. Mark, M.D., M.P.H., Hussein R. Al-Khalidi, Ph.D., Brendan Cavanaugh, M.D., Jason Cole, M.D., Rowena J. Dolor, M.D., Christopher B. Fordyce, M.D., Megan Huang, Ph.D., Muhammad Akram Khan, M.D., Andrzej S. Kosinski, Ph.D., Mitchell W. Krucoff, M.D., Vinay Malhotra, M.D., Michael H. Picard, M.D., James E. Udelson, M.D., Eric J. Velazquez, M.D., Eric Yow, M.S., Lawton S. Cooper, M.D., M.P.H., and Kerry L. Lee, Ph.D.,  
for the PROMISE Investigators\*

### **METHODS**

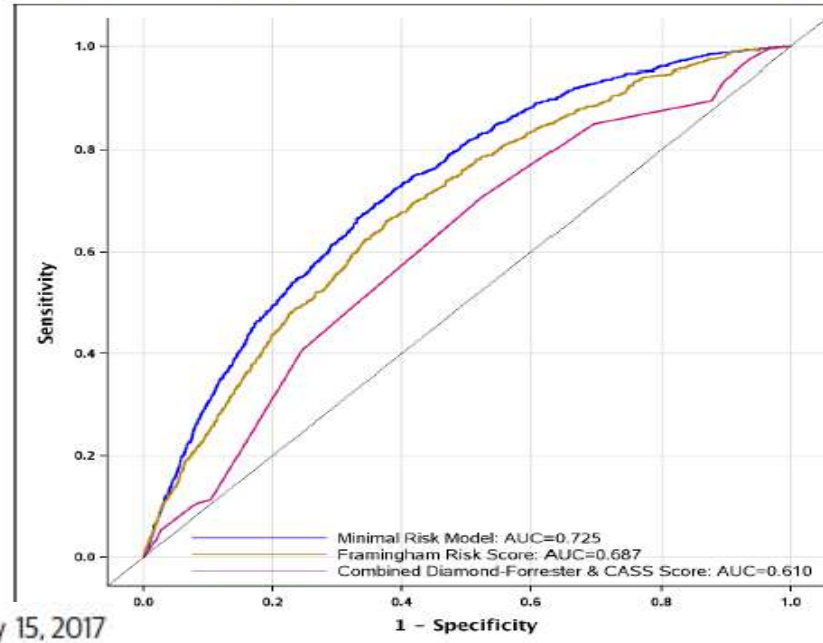
We randomly assigned 10,003 symptomatic patients to a strategy of initial anatomical testing with the use of coronary computed tomographic angiography (CTA) or to functional testing (exercise electrocardiography, nuclear stress testing, or stress echocardiography). The composite primary end point was death, myocardial infarction, hospitalization for unstable angina, or major procedural complication. Secondary end points included invasive cardiac catheterization that did not show obstructive CAD and radiation exposure.

**Table 1. Characteristics of the Trial Participants at Baseline, According to Study Group.\***

Characteristic	CTA Strategy (N= 4996)	Functional-Testing Strategy (N= 5007)
Mean age — yr	60.7±8.3	60.9±8.3
Female sex — no. (%)	2595 (51.9)	2675 (53.4)
Primary presenting symptom — no./total no. (%)		
Chest pain	3673/4992 (73.6)	3599/5004 (71.9)
Dyspnea on exertion	712/4992 (14.3)	778/5004 (15.5)
Other¶¶	607/4992 (12.2)	627/5004 (12.5)
Type of angina — no. (%)¶¶¶		
Typical	590 (11.8)	576 (11.5)
Atypical	3873 (77.5)	3900 (77.9)
Nonanginal pain	533 (10.7)	531 (10.6)



eFigure 2. Comparison of Risk Scores for the Prediction of Minimal Risk



JAMA Cardiology Published online February 15, 2017

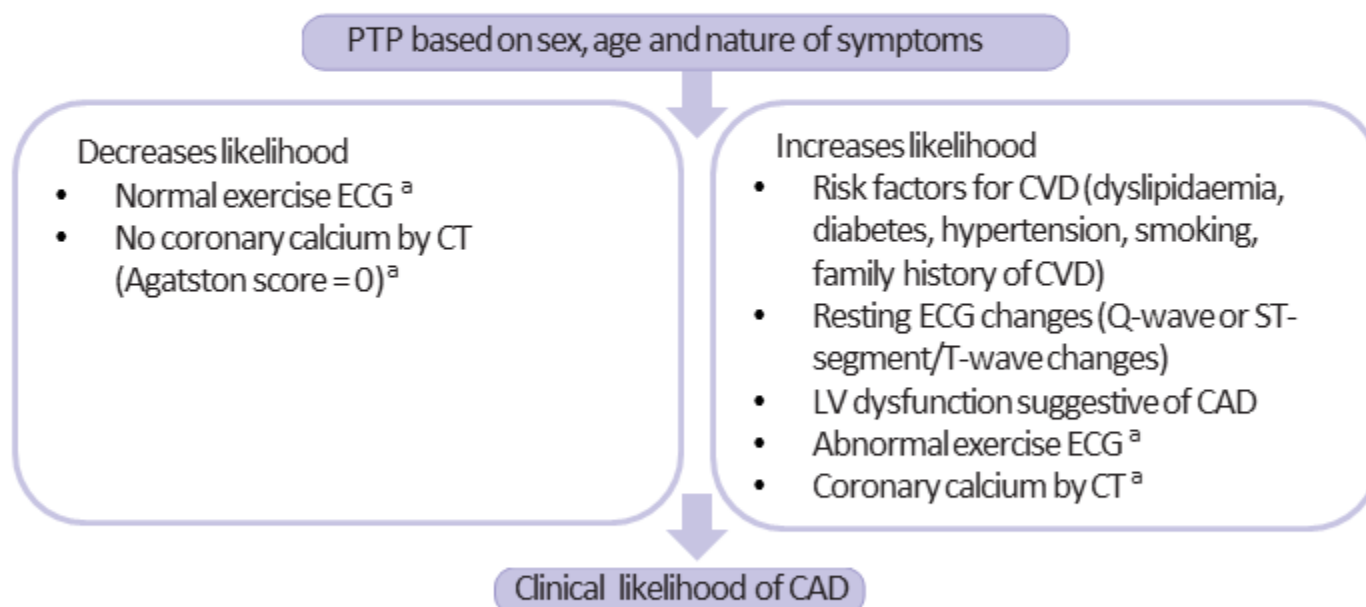
The PROMISE Minimal Risk score (area under the curve [AUC] =0.725)

Table 2. Factors Associated With Minimal Risk in the Final Derivation Model<sup>a</sup>

Factor	Odds Ratio (95% CI) <sup>b</sup>	P Value
Age (per 5-y decrease)	1.50 (1.41-1.60)	<.001
Female sex	2.59 (2.13-3.16)	<.001
Racial or ethnic minority	1.29 (1.05-1.59)	.01
No hypertension	1.55 (1.29-1.85)	<.001
No dyslipidemia	1.43 (1.19-1.72)	<.001
Never smoker <sup>c</sup>	1.66 (1.40-1.98)	<.001
No family history of CAD	1.34 (1.06-1.68)	<.001
No diabetes	1.48 (1.23-1.78)	.0
Symptoms unrelated to physical or mental stress <sup>d</sup>	1.48 (1.23-1.78)	.007
HDL-C (per 5-point increase)	1.04 (1.01-1.07)	.01

# Patients with angina and/or dyspnoea and suspected coronary artery disease

## Determinants of clinical likelihood of CAD



<sup>a</sup> if available.

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## Patients with angina and/or dyspnoea and suspected coronary artery disease - Use of diagnostic imaging tests (1)

### Recommendations

Non-invasive functional imaging for myocardial ischaemia<sup>a</sup> or coronary CTA is recommended as the initial test to diagnose CAD in symptomatic patients in whom obstructive CAD cannot be excluded by clinical assessment alone.

Class Level

I

B

It is recommended that selection of the initial non-invasive diagnostic test is done based on the clinical likelihood of CAD and other patient characteristics that influence test performance,<sup>b</sup> local expertise, and the availability of tests.

I

C

Functional imaging for myocardial ischaemia is recommended if coronary CTA has shown CAD of uncertain functional significance or is not diagnostic.

I

B

Invasive angiography is recommended as an alternative test to diagnose CAD in patients with a high clinical likelihood, severe symptoms refractory to medical therapy or typical angina at a low level of exercise, and clinical evaluation that indicates high event risk. Invasive functional assessment must be available and used to evaluate stenoses before revascularization, unless very high grade (>90% diameter stenosis).

I

B

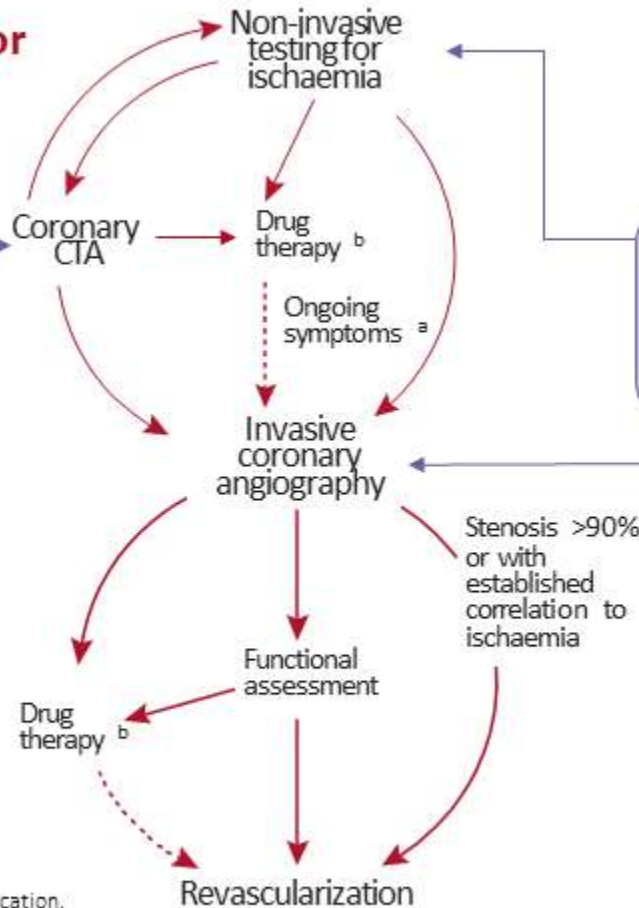
<sup>a</sup> Stress echocardiography, stress cardiac magnetic resonance, single-photon emission CT, or positron emission tomography. <sup>b</sup> Characteristics determining ability to exercise, likelihood of good image quality, expected radiation exposure, and risks or contraindications.

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## Patients with angina and/or dyspnoea and suspected coronary artery disease

### Main diagnostic pathways

- Preferentially considered if:
- ▶ Low clinical likelihood
  - ▶ Patient characteristics suggest high image quality
  - ▶ Local expertise and availability
  - ▶ Information on atherosclerosis desired
  - ▶ No history of CAD



- Preferentially considered if:
- ▶ High clinical likelihood
  - ▶ Revascularization likely
  - ▶ Local expertise and availability
  - ▶ Viability assessment also required

- Preferentially considered if:
- ▶ High clinical likelihood and severe symptoms refractory to medical therapy
  - ▶ Typical angina at low level of exercise and clinical evaluation including exercise ECG indicates high-risk of events
  - ▶ LV dysfunction suggestive of CAD

<sup>a</sup> Consider microvascular angina.

<sup>b</sup> Antianginal medications and/or risk-factor modification.

## Patients with angina and/or dyspnoea and suspected coronary artery disease - Use of diagnostic imaging tests (2)

Recommendations	Class	Level
Invasive coronary angiography with the availability of invasive functional evaluation should be considered for confirmation of the diagnosis of CAD in patients with an uncertain diagnosis on non-invasive testing.	<b>IIa</b>	<b>B</b>
Coronary CTA should be considered as an alternative to invasive angiography if another non-invasive test is equivocal or non-diagnostic.	<b>IIa</b>	<b>C</b>
Coronary CTA is not recommended when extensive coronary calcification, irregular heart rate, significant obesity, inability to cooperate with breath-hold commands, or any other conditions make obtaining good image quality unlikely.	<b>III</b>	<b>C</b>
Coronary calcium detection by CT is not recommended to identify individuals with obstructive CAD.	<b>III</b>	<b>C</b>

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## Patients with angina and/or dyspnoea and suspected coronary artery disease - Risk assessment (1)

Recommendations	Class	Level
Risk stratification is recommended based on clinical assessment and the result of the diagnostic test initially employed to diagnose CAD.	I	B
Resting echocardiography is recommended to quantify LV function in all patients with suspected CAD.	I	C
Risk stratification, preferably using stress imaging or coronary CTA (if permitted by local expertise and availability), or alternatively exercise stress ECG (if significant exercise can be performed and the ECG is amenable to the identification of ischaemic changes), is recommended in patients with suspected or newly diagnosed CAD.	I	B
In symptomatic patients with a high-risk clinical profile, ICA complemented by invasive physiological guidance (FFR) is recommended for cardiovascular risk stratification, particularly if the symptoms are responding inadequately to medical treatment and revascularization is considered for improvement of prognosis.	I	A

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**El dolor torácico es uno de los síntomas que más frecuentemente lleva a la consulta cardiológica.**

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**La valoración de los síntomas y aplicación de scores de probabilidad debe individualizarse.**

Conclusiones

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**Tanto los estudios de funcionalidad como anatómicos demostraron ser efectivos.**

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**La estratificación de riesgo y el resultado post test ayudan a identificar con mayor precisión.**

2022

**Muchas gracias por su  
atención**

