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BCS Editorial

Chronic Coronary Syndrome – a new era for the diagnosis and management of stable coronary artery disease?

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Take Home Messages

- The European Society of Cardiology 2019 guidelines have removed the term "stable" angina and replaced it with the term "chronic coronary syndrome" (CCS).
- CCS syndromes have been classified into 6 separate entities, each of which have an impact on further investigations and management.
- Emphasis is placed on imaging and functional modalities for low-intermediate risk patients.
- Good history and examination skills are still key.

Introduction

The 2019 European Society of Cardiology (ESC) guidelines on the management and classification of angina have undergone an overhaul for 2019.[1] Prior to this, the guidelines were referred to as the 2013 ESC guidelines on the management of stable coronary artery disease (CAD). The term "stable CAD" has been replaced with "chronic coronary syndrome" heralding a new era in the management of CAD. Focus has now shifted on CAD as being part of a spectrum of disease. Patients with CAD can go on to develop acute coronary syndromes at any point in the progression of their disease. Hence, the term "chronic stable angina" now falling out of favour due to implications it has for the management of chronic ischaemic symptoms. CAD is a dynamic process resulting from a myriad of interactions including in part, environmental and genetic. This results in a disease process that can have long, stable periods, but can also become unstable at any time. This is typically due to an acute atherothrombotic event caused by plaque rupture or erosion. The frequent use of the term "stable" implies that the complex pathological process that underpins angina remains dormant, which in most circumstances is far from reality.

The change in nomenclature emphasizes the fact that the clinical presentations of CAD can be categorized as either acute coronary syndrome or chronic coronary syndrome (CCS). CAD is a dynamic process of atherosclerotic plaque accumulation and functional alterations of coronary circulation that can be modified by lifestyle, pharmacological therapies, and revascularisation which result in disease stabilization or regression. The ESC guideline serves to highlight that even in clinically latent phases the disease process is rarely silent and requires a conscious effort between patient and physician to prevent disease progression. This editorial gives a brief overview of the 2019 ESC guidelines focusing on new concepts and recommendations.

About the author

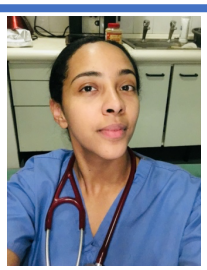

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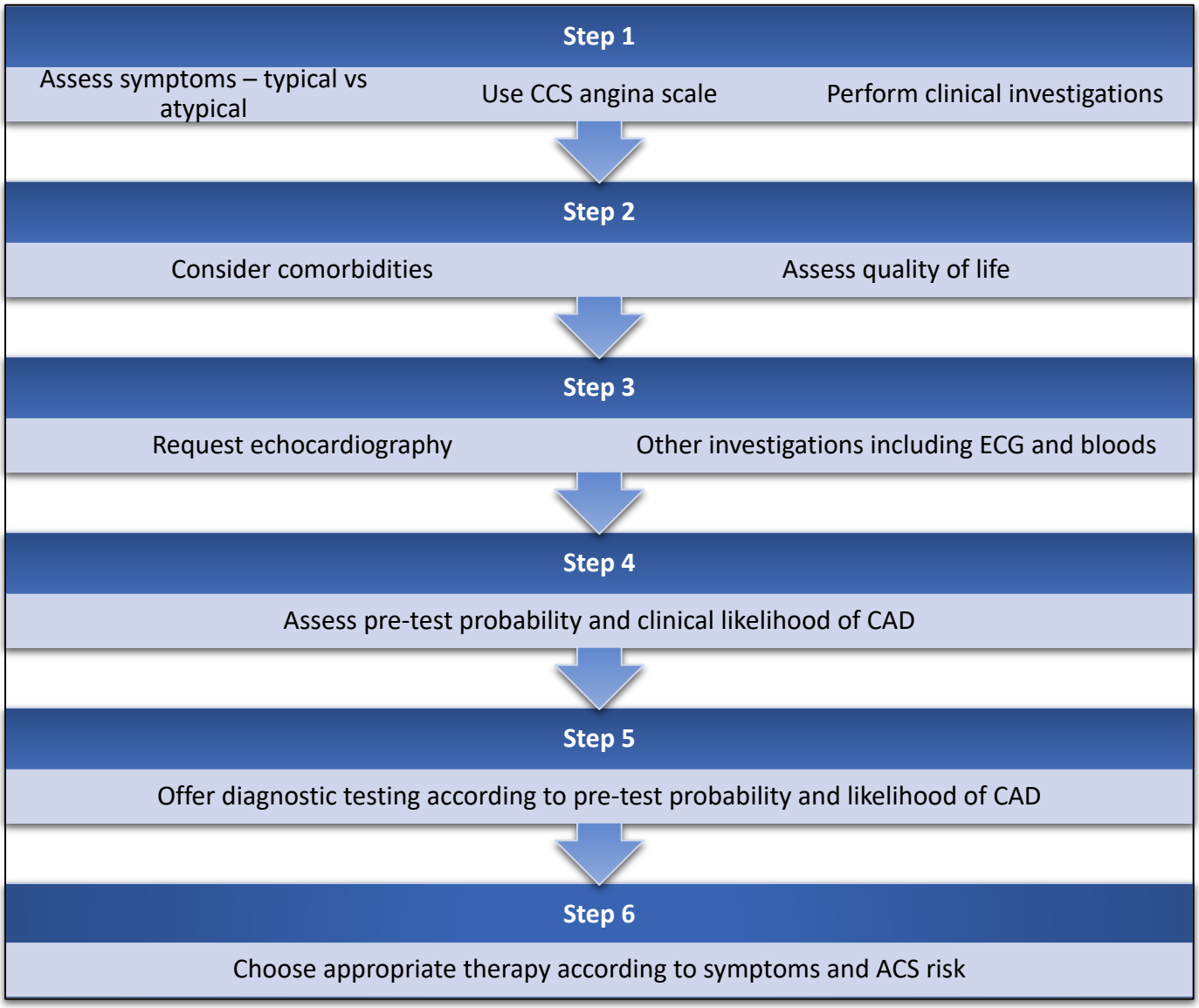
Figure 1. Six steps to diagnosing CAD (adapted from [1])



Step 1 Assess symptoms and signs to distinguish between typical and atypical symptoms.
Step 2 Assess quality of life and comorbidities. Apply guideline-based risk-factor modification based on commonly applied risk charts e.g. SCORE.[2]
Step 3 Basic testing including troponin assays should be considered. 12 lead ECG and TTE is recommended. CMR may be considered in patients with strong suspicion of CAD where TTE is within normal limits.
Step 4 The clinical likelihood of obstructive CAD is estimated. A new phrase has been coined for the guideline entitled "clinical likelihood of CAD" and is underpinned by the improved PTP score.[3] PTP <15% corresponds to <1% annual risk of cardiovascular death or MI.[4] Therefore, routine testing in these patients can safely be deferred reducing unnecessary procedures and costs. The data on which the PTP in the previous guideline was based has since been updated based on a pooled analysis of 3 cohort studies and has highlighted that the presence of obstructive disease amongst patients with suspected CAD is lower than once thought.[5]
Step 5 Offer diagnostic testing to selected patients screened via steps 1-4 to establish the diagnosis of CAD. This includes the options of invasive and non-invasive imaging depending on the risk. The choice of test also depends on the PTP of CAD with modalities such as CTCA more effective in low clinical probability situations.
Step 6 Once a diagnosis of obstructive CAD has been confirmed, patients undergo risk stratification to guide subsequent therapeutic interventions. The event risk is determined by clinician judgement and depends on the investigation modality used to determine CAD (see **Table 2**).

CAD coronary artery disease, CCS Canadian Cardiovascular Society, CMR cardiac magnetic resonance, CTCA computed tomography coronary angiography, ECG electrocardiography, PTP pre-test probability, SCORE Systematic COronary Risk Evaluation, TTE transthoracic echocardiography.

Table 1. Chronic coronary syndrome categories according to the ESC guidelines[1]

Category	Description
1	Patients with suspected CAD and "stable" angina symptoms*
2	Patients with new onset of heart failure or left ventricular dysfunction and suspected CAD
3	Asymptomatic and symptomatic patients <1 year after an ACS or recent revascularisation
4	Patients >1 year after initial angina diagnosis or revascularisation
5	Patients with angina and suspected vasospastic or microvascular disease
6	Asymptomatic patients in whom CAD is detected at screening

* including dyspnoea as angina equivalent. ACS acute coronary syndrome, CAD coronary artery disease, ESC European Society of Cardiology.

Chronic coronary syndromes according to the ESC – what's new for 2019?

As alluded to in the introduction, the new guidelines not only provide us with a change in nomenclature that distances itself from the term "stable" that has previously been used to describe angina but also provide a novel way of categorising it. The guidelines categorise patients into the possible clinical presentations of angina or chronic coronary syndromes (see **Table 1**). This provides a system of diagnosing and investigating coronary artery disease that is more in keeping with what physicians are likely to encounter in the real world.

The natural history of coronary artery disease gives us some insight as to why this disease is never really "stable". Firstly, the term stable is usually used to describe characteristics of plaque disease, however, some patients with CAD do not have plaque disease with the aetiology of their CAD being coronary artery spasm or microvascular disease. Secondly, the term "stable" implies that these patients are low risk and that there is less urgency to initiate treatment or lifestyle modification factors which is far from the truth. The authors of the guidelines serve to highlight that active treatment also includes lifestyle modification and medication, and not only invasive strategies.

Diagnosing CAD

The general approach for the initial diagnostic management of patients with angina and suspected obstructive CAD includes six steps according to the CCS guideline (see **Figure 1**). The initial diagnostic approach is the same regardless of the above category. The patient subgroups become more important in the assessment of clinical probability of CAD.

Management of CAD

The guidelines continue to emphasise the importance of lifestyle in the prevention and regression of chronic coronary syndromes. The worry over the last couple of years remains that the evolution of pharmaceutical interventions such as novel lipid lowering agents in the form of proprotein convertase subtilisin/kexin-9 (PCSK-9) inhibitors and the use of oral anticoagulants (e.g. Rivaroxaban in high risk patients) has over-shadowed the importance of lifestyle modifications. Clinicians should use an "opportunistic" approach to address secondary prevention measures and utilise community resources such as gym initiatives and cardiac rehabilitation to ensure continued engagement.

Beta blockers and calcium channel blockers remain the first line therapies in angina symptom control and should be tailored to the patient's heart rate, blood pressure and left ventricular function. The use of other secondary prevention medication (e.g. angiotensin converting inhibitors, statins) also remain unchanged.

New to the guidelines is the continued use of long-term antiplatelet therapy in those considered to be high risk with dual antiplatelet therapy in the form of aspirin and a P2Y12 inhibitor or low dose Rivaroxaban, based on evidence from the Cardiovascular Outcomes for People Using Anticoagulation Strategies (COMPASS) trial[6] and the Anti-Xa Therapy to Lower Cardiovascular Events in Addition to Standard Therapy in Subjects with

Table 2. Definition of risk based on the investigations used to diagnose CAD according to the ESC guidelines 2019[1]

Investigation	Definition of "high risk"
Exercise ECG*	Cardiovascular mortality >3% per year according to Duke Treadmill Score.
SPECT or PET perfusion imaging	Area of ischaemia ≥10% of the left ventricle myocardium.
Stress echocardiography	≥3 of 16 segments with stress-induced hypokinesia or akinesia.
Cardiac magnetic resonance imaging	≥2 of 16 segments with stress perfusion defects or ≥3 dobutamine-induced dysfunctional segments.
Coronary CT angiogram or invasive coronary angiogram	Three-vessel disease with proximal stenoses, left main disease, or proximal anterior descending disease.
Invasive functional testing	FFR ≤0.8, iwFR ≤0.89

* ST segment deviation from baseline is considered a positive test. CAD coronary artery disease, CT computed tomography, ECG electrocardiography, FFR fractional flow reserve, iwFR instantaneous wave-free ratio, PET positron emission tomography, SPECT single-photon emission computed tomography.

Acute Coronary Syndrome–Thrombolysis in Myocardial Infarction 51 (ATLAS ACS 2-TIMI 51) Trial.[7] The caveat to this would be the presence of atrial fibrillation. The Rivaroxaban dose in COMPASS and ATLAS ACS 2-TIMI 51 was 2.5 mg twice daily however the dose for patients with atrial fibrillation is 20 mg once daily (15 mg once daily in high bleeding risk or renal impairment). Patients on the lower dose Rivaroxaban who develop atrial fibrillation and have CHA_2DS_2VASc ≥1 (male) or ≥2 (female) should be switched to the higher dose or they will be at increased risk of stroke.

Invasive management should be guided by the established "risk" of a cardiac event. For any planned revascularisation decision, both anatomical and functional status (e.g. via stress echocardiography, stress CMR or nuclear modalities) should be considered. Essentially, the guideline favours the use of a non-invasive approach to diagnosis unless a patient is deemed high risk, or a separate imaging modality is inconclusive.

Special Circumstances

Patient populations that pose the most difficult diagnostic and management questions include the elderly, those with other underlying comorbidities (e.g. chronic kidney disease) and patients with vasospastic or microvascular angina. Symptoms are often atypical or silent as in chronic kidney disease.[8] All these difficulties in part arise from a lack of trials and an evidence base from which to guide decision making. The exception is microvascular angina where a few randomised controlled trials have been completed[9,10] but the application of suggested diagnostic methods such as an index of microcirculatory flow and coronary flow reserve in microvascular angina or provocation testing in vasospastic angina are infrequently used largely due to operator inexperience. Overall there are no new suggestions or updates for these categories where clinician discretion remains the mainstay of treatment and diagnosis.

Conclusion

The new ESC guidelines reinforce the movement away from the term "chronic stable angina" and towards active management of CAD. This serves to ensure a consistent dynamic approach to the management of angina symptoms. The changes since the last version of the guideline reflect an evolution in current understanding and practices including the use of functional tests of ischaemia and imaging modalities to improve diagnostic reasoning. Ultimately, emphasis is on good clinical judgement. However, this is in contrast with National Institute for Health and Care Excellence (NICE) 2016 guidelines on the diagnosis of chest pain.[11] The NICE guidelines recommend computed tomography coronary angiography for those with and without typical chest pain, saving functional tests for those with symptoms and previously confirmed CAD. In addition, there is no focus on

performing a pre-test probability score.

Although my clinical practice hasn't significantly changed based on these updated guidelines, they serve as a reminder that cardiology is steadily moving away from a "gung-ho" invasive approach towards an era of imaging/functional testing to guide our revascularisation strategies.

Disclosures

None.

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