Topical issues of diagnosis and treatment of IHD in out-patients

Lecture by Associate Professor Ye.P. Smuglov

International classification of Ischaemic heart disease (ESC-2013)

- Sudden coronary death
- Angina pectoris
- Acute myocardial infarction
- Painless myocardial ischaemia
- Heart failure
- Disturbences of rhythm and conductivity

European Heart Journal (2013) 34, 2949–3003
doi:10.1093/eurheartj/eht296

ESC GUIDELINES

2013 ESC guidelines on the management of stable coronary artery disease

The Task Force on the management of stable coronary artery disease of the European Society of Cardiology

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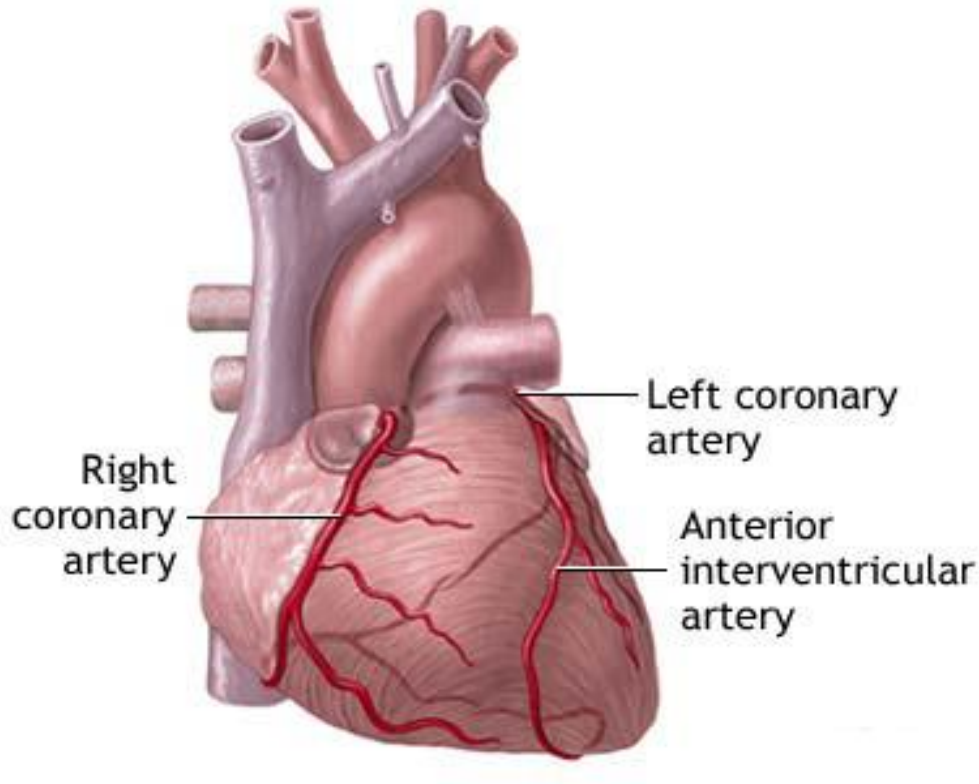
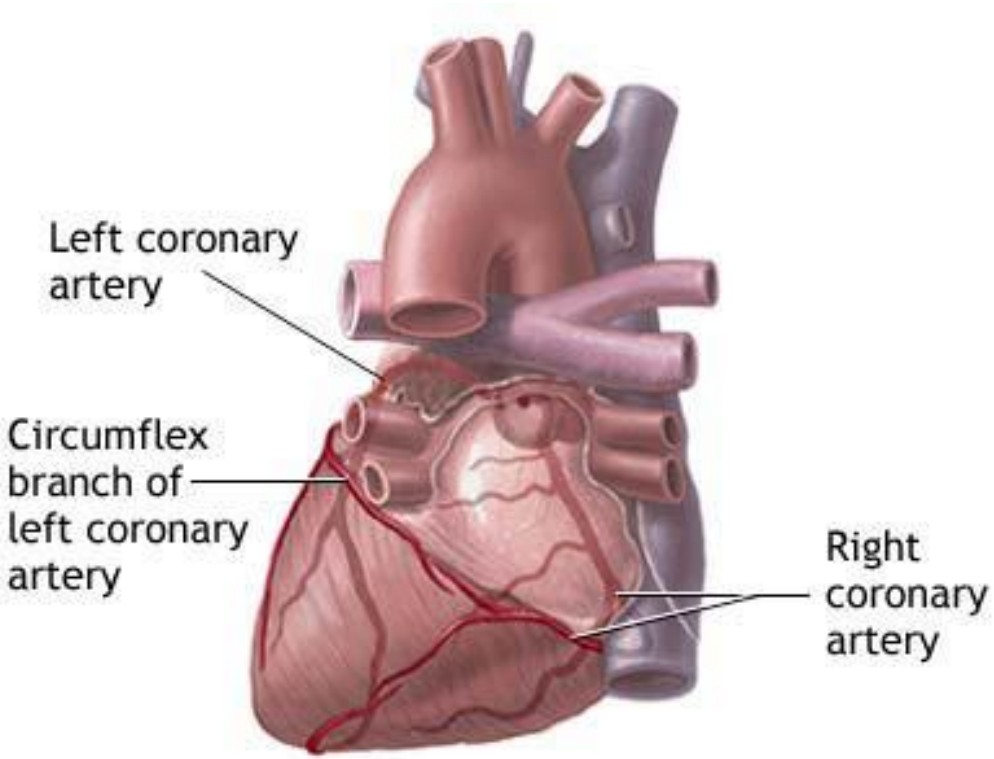
Ischaemic heart disease . Anterior Heart Arteries



- The coronary arteries supply blood to the heart muscle. The right coronary artery supplies both the left and the right heart; the left coronary artery supplies the left heart.

Ischaemic heart disease . Posterior Heart Arteries



- The coronary arteries supply blood to the heart muscle. The right coronary artery supplies both the left and the right heart; the left coronary artery supplies the left heart.

Ischaemic heart disease

- Ischaemic heart disease (Coronary heart disease) – is the most common form of heart disease and the single most important cause of premature death in Europe, Russia, North and South America, Australia and New Zealand. By 2020 it is estimated that it will be the major cause of death in all regions of the world.
- Ischaemic heart disease (IHD) – heart disease due to imbalance between myocardial oxygen supply and demand, which assotiated with atherosclerosis of coronary arteries in 95-96% cases.

RISK FACTORS

- **Nonmodifable:**
  -Age (> 45);
  -Male gender;
  -Family history (genetic predisposition);
  -Aethnic origin

- **Modifable :**
  -Dyslipidaemia;
  -Arterial hypertension;
  -Smoking;
  -Diabetes mellitus;
  -Obesity;
  -Fatty food diet;
  -Physical inactivity;
  -Stress;
  -Hypoestrogenemia in female

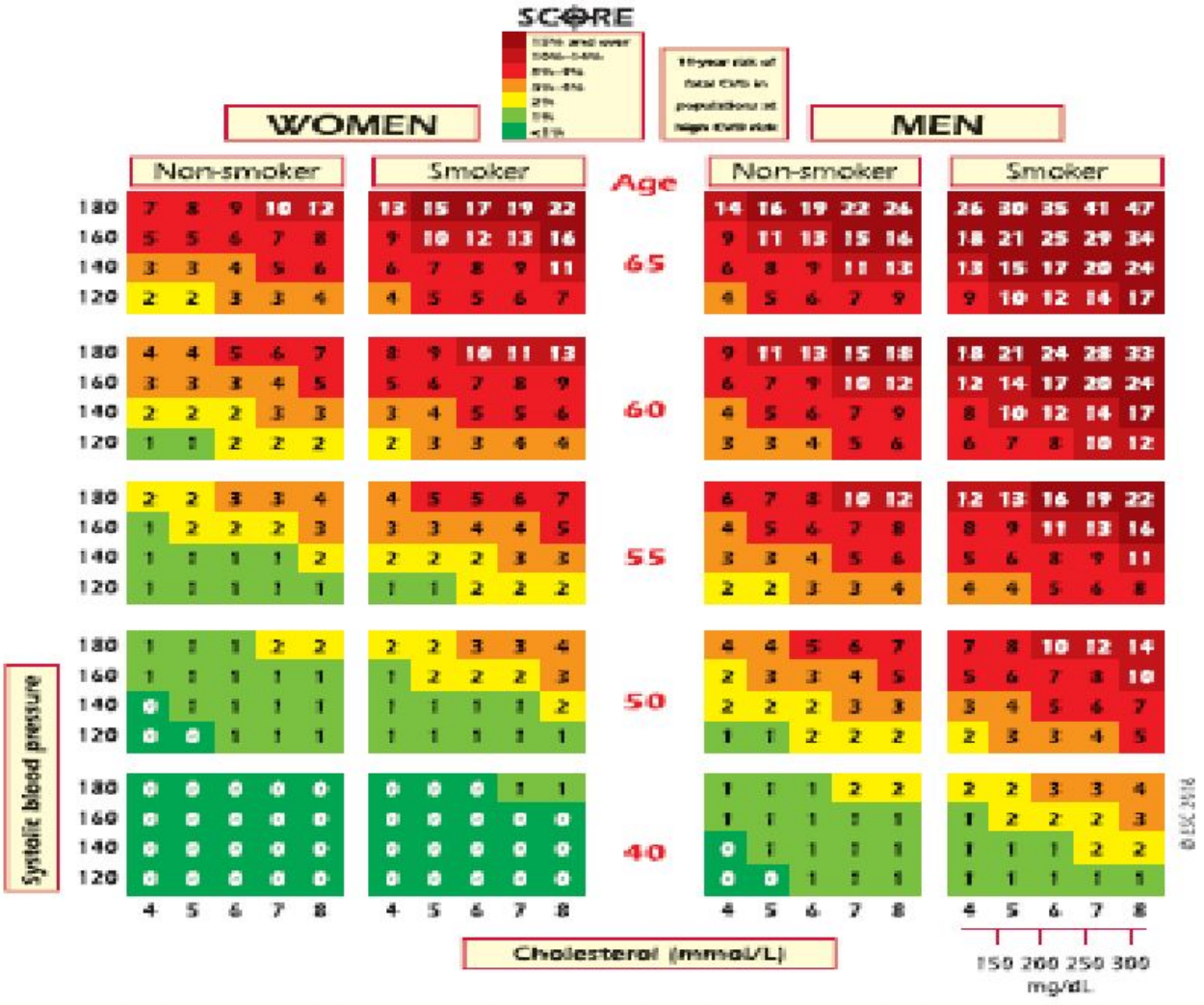


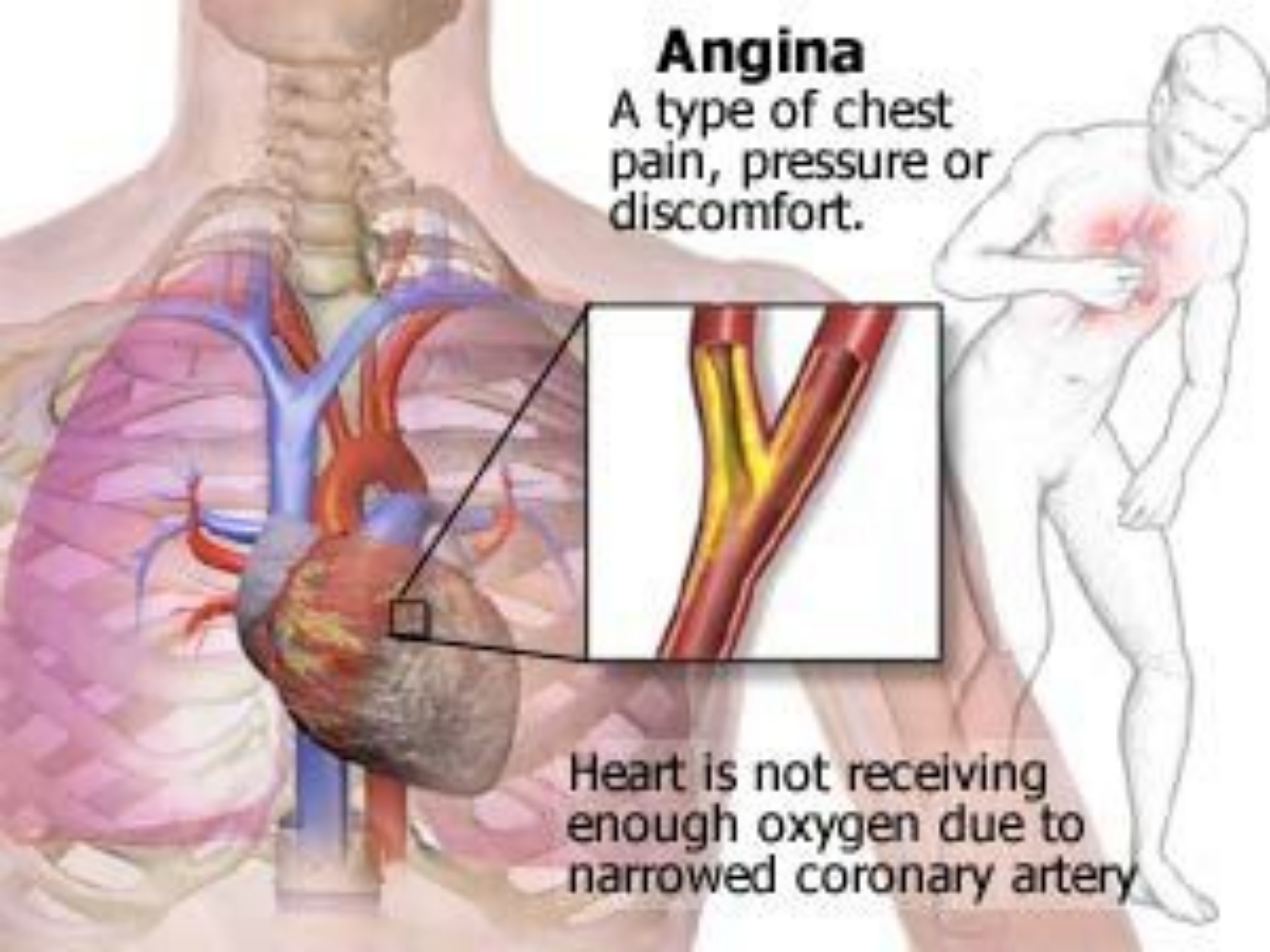
Figure 2 **SCORE** chart: 10-year risk of fatal cardiovascular disease (CVD) in populations at high CVD risk based on the following risk factors: age, gender, smoking, systolic blood pressure, and total cholesterol. To convert the risk of fatal CVD to risk of total (fatal + non-fatal) hard CVD, multiply by 3 in men and 4 in women, and slightly less in old people. Note: the SCORE chart is for use in people without overt CVD, diabetes, chronic kidney disease, familial hypercholesterolaemia or very high levels of individual risk factors because such people are already at high-risk and need intensive risk factor advice.

variable multipliers to convert fatal to total events. In addition, total event charts, in contrast to those based on mortality, cannot easily be recalibrated to suit different populations.

Naturally, the risk of total fatal and non-fatal events is higher, and clinicians frequently ask for this to be quantified. The *SCORE* data indicate that the total CVD event risk is about three times higher

Ischaemic heart disease

- **ANGINA PECTORIS-DEFINITION**
- Angina pectoris is the symptom complex caused by transient myocardial ischaemia and may occur whenever there is an imbalance between myocardial oxygen supply and demand.
- Angina pectoris is the medical term used to describe chest pains caused by poor blood flow to certain areas of heart muscle. Often, the name is shortened to angina. Having angina means patient has an increased risk of having a heart attack (myocardial infarction). Angina can be a useful warning sign if it makes you seek timely medical help and avoid a heart attack. Prolonged or unchecked angina can lead to a heart attack or increase risk of having a heart rhythm abnormality. That could lead to sudden death. Time is very important in regard to angina. The more time patient heart is deprived of adequate blood flow, and thus oxygen, the more heart muscle is at risk of heart attack or heart rhythm abnormalities.


Angina
A type of chest pain, pressure or discomfort.
Heart is not receiving enough oxygen due to narrowed coronary artery

ETIOLOGY

There are causes of angina.

1. **Coronary (heart) artery atherosclerosis.**

Coronary spasm is also called variant angina Prinzmetal angina. Variant angina typically occurs when you are at rest. But in as many as 96% of cases, at least 1 blood vessel of heart has severe coronary blockage. Critical blockage of a coronary artery from atherosclerotic plaque build up. When cholesterol or blood fats are too high, or patient has other risk factors, a fatlike material called atherosclerotic plaque builds up in blood vessels. Eventually the plaque will block blood flow through the vessel.

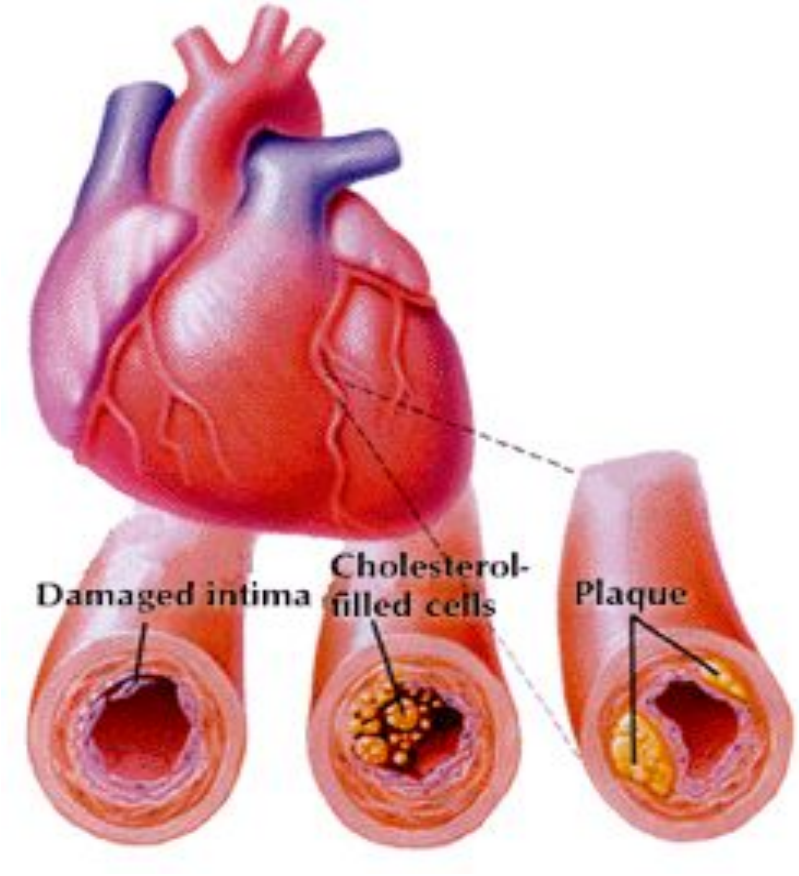
2. **Exercise and emotional stress cause angina**.

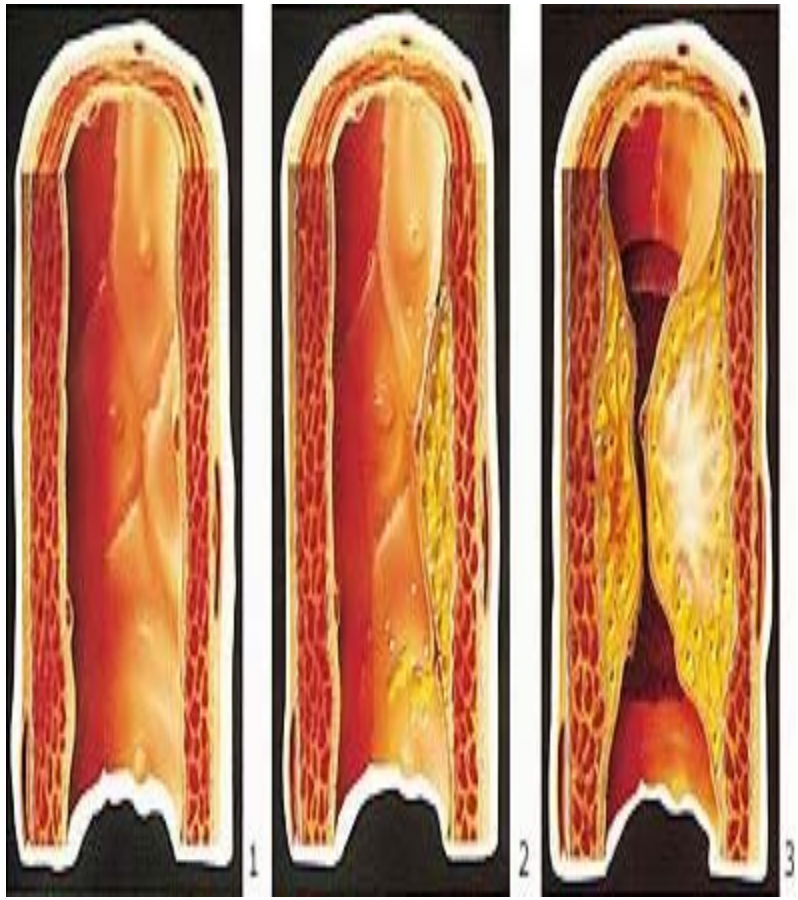
Decreased oxygen content in the air patient breathe (flying or being at high altitude) may trigger angina. Low blood flow to the heart, which occurs when you are in deep sleep, also can bring on angina. People commonly arrive at the Emergency Department in the early morning complaining of chest pain that awakened them from sleep, or the pain started after "just going to the bathroom."

3. **Microvascular dysfunction**.

4 .**The discrepancy between the demand and supply of myocardial oxygen**

Coronary (heart) artery atherosclerosis





OTHER REASONS OF ANGINA AND ISCHAEMIA OF MYOCARDIUM

- **Noncoronarogenic diseases:**
- arterial hypertension,
- aortic stenosis,
- hypertrophic cardiomyopathy,
- dilated cardiomyopathy,
- paroxysmal tachyarrhythmias,
- anaemia,
- hypoxemia,
- thyreothoxicosis.

Ischaemic cascade

- 1-The discrepancy between the demand and the delivery of oxygen
  2 - Myocardial ischemia
  3 - Reduced pH and the yield of K of cardiomyocytes
  4 - Increased intracellular Ca
  5 - Regional LV contractility violation
  6 - Signs of global systolic and diastolic dysfunction
  7 - The appearance of ST segment change
  8 - Development of pain attack

Identifying ischaemic cardiac chest pain

- **Ischaemic cardiac chest pain:**
- ***Location*** - central, diffuse
- ***Radiation*** -Jaw/neck/shoulder/ arm/back
- ***Character*** -tight, burning ,squeezing, choking
- ***Duration*** – less than 15 min (3-5 min)
- ***Precipitation*** -by exertion and/or emotion
- ***Relieving factors*** - rest, quick response to nitrates
- ***Associated features-*** Breathlessness

SIGNS AND SYMPTOMS

- An uncomfortable pressure, fullness, squeezing or pain in the center of your chest
- Pain spreading to shoulders, neck, or arms and lasting more than a few minutes.The pain may be mild to intense.
- It may feel like pressure, tightness, burning, or a heavy weight.
- It may be located in the chest, upper abdomen, back, neck, jaw, or inside arms or shoulders.
- Chest discomfort with light headedness
- Anxiety, nervousness or fainting, sweating, nausea, or shortness of breath
- Increased or irregular heart rate
- Paleness
- Cold sweaty skin
- Feeling of impending doom

Main features of SCAD

Pathogenesis
Stable anatomical atherosclerotic and/or functional alterations of epicardial vessels and/or microcirculation
Natural history
Stable symptomatic or asymptomatic phases which may be interrupted by ACS
Mechanisms of myocardial ischaemia
Fixed or dynamic stenoses of epicardial coronary arteries
Microvascular dysfunction
Focal or diffuse epicardial coronary spasm
The above mechanisms may overlap in the same patient and change over time
Clinical presentations
Effort induced angina caused by: • epicardial stenoses • microvascular dysfunction • vasoconstriction at the site of dynamic stenosis • combination of the above
Rest angina caused by: – Vasospasm (focal or diffuse): • epicardial focal • epicardial diffuse • microvascular • combination of the above
Asymptomatic: • because of lack of ischaemia and/or of LV dysfunction • despite ischaemia and/or LV dysfunction
Ischaemic cardiomyopathy

ACS = acute coronary syndrome; LV = left ventricular; SCAD = stable coronary artery disease.
This slide corresponds to Table 3 in the full text.

Eur Heart J 2013;34:2949–3003. doi:10.1093/eurheartj/eht296

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Stable Angina

- Stable angina is a repeating pattern of chest pain which has not changed in character, frequency, intensity or duration for several weeks. The level of activity or stress that provokes angina is predictable and the pattern changes slowly. Stable angina is the most common form and it appears gradually. These patients have an increased risk of a heart attack, but an episode of stable angina does not indicate that a heart attack is about to happen. A crucial component of the management of the pain associated with angina pectoris is Identifying sources of stress and creating effective methods to minimize stress.

Traditional clinical classification of chest pain

Typical angina (definite)	Meets all three of the following characteristics: • substernal chest discomfort of characteristic quality and duration; • provoked by exertion or emotional stress; • relieved by rest and/or nitrates within minutes.
Atypical angina (probable)	Meets two of these characteristics.
Non-anginal chest pain	Lacks or meets only one or none of the characteristics.

This slide corresponds to Table 4 in the full text.

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Classification of angina severity according to the Canadian Cardiovascular Society

Class I	**Ordinary activity does not cause angina such as walking and climbing stairs.** Angina with strenuous or rapid or prolonged exertion at work or recreation.
Class II	**Slight limitation of ordinary activity.** Angina on walking or climbing stairs rapidly, walking or stair climbing after meals, or in cold, wind or under emotional stress, or only during the first few hours after awakening. Walking more than two blocks on the level and climbing more than one flight of ordinary stairs at a normal pace and in normal conditions.
Class III	**Marked limitation of ordinary physical activity.** Angina on walking one to two blocks[a] on the level or one flight of stairs in normal conditions and at a normal pace.
Class IV	**Inability to carry on any physical activity without discomfort,** angina syndrome may be present at rest.

[a]Equivalent to 100–200 m.

This slide corresponds to Table 5 in the full text.

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Prinzmetal's Angina

- Prinzmetal’s or spontaneous or angiospastic angina is caused by a vasospasm, a spasm that narrows the coronary artery and lessens the blood flow to the heart. Prinzmetal's Angina usually occurs in arteries already narrowed by atherolsclerosis, in fact most people with it have severe coronary atherosclerosis in at least one major vessel. The spasm usually occurs very close to the blockage. Unlike stable and unstable angina, Prinzmetal's Angina usually occurs when a person is at rest or sleep (often at night) and not after physical exertion or emotional stress. It is associated with acute myocardial infarction, severe cardiac arrhythmias including ventricular tachycardia and fibrillation, and sudden cardiac death.

Microvascular Angina or "Stable Angina Pectoris on angiographycally intact vessels or Coronary Syndrome X

- Microvascular angina, or Syndrome X, occurs when the patient experiences chest pain but has no apparent coronary artery blockage. This condition results from poor functioning of the tiny blood vessels that nourish the heart, arms and legs. Microvascular angina can occur during exercise or at rest. Reduced vasodilator capacity of the coronary microvessels is thought to be a cause of angina during exercise, but the mechanism of angina at rest is not known. Coronary microvascular spasm and resultant myocardial ischemia may be the cause of chest pain in a subgroup of patients with microvascular angina

Coronary Syndrome X

- **Characterized by 3 specific typical signs as :**
- Classic anginal chest pain
- ST segment depression on ECG during stress-test
- Angiographically normal coronary arteries without LV dysfunction

Blood tests in assessment of patients with known or suspected SCAD in order to optimize medical therapy

Recommendations	Class	Level
If evaluation suggests clinical instability or ACS, repeated measurements of troponin preferably using high sensitivity or ultrasensitive assays are recommended to rule out myocardial necrosis associated with ACS.	I	A
Full blood count including haemoglobin and white cell count is recommended in all patients.	I	B
It is recommended that screening for potential T2DM in patients with suspected and established SCAD is initiated with HbA_{1c} and fasting plasma glucose and that an OGTT is added if HbA_{1c} and fasting plasma glucose are inconclusive.	I	B
Creatinine measurement and estimation of renal function (creatinine clearance) are recommended in all patients.	I	B
A fasting lipid profile (including LDL) is recommended in all patients.	I	C
If indicated by clinical suspicion of thyroid disorder assessment of thyroid function is recommended.	I	C
Liver function tests are recommended in patients early after beginning statin therapy.	I	C
Creatine kinase measurements are recommended in patients taking statins and complaining of symptoms suggestive of myopathy.	I	C
BNP/NT-proBNP measurements should be considered in patients with suspected heart failure.	IIa	C

ACS = acute coronary syndrome; BNP = B-type natriuretic peptide; HbA_{1c} = glycated haemoglobin; LDL = low-density lipoprotein; NT-proBNP = N-terminal pro B-type natriuretic peptide; SCAD = stable coronary artery disease; T2DM = type 2 diabetes mellitus.
This slide corresponds to Table 6 in the full text.

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Blood tests for routine reassessment in patients with chronic SCAD

Recommendation	Class	Level
Annual control of lipids, glucose metabolism and creatinine is recommended in all patients with known SCAD.	I	C

SCAD = stable coronary artery disease.

This slide corresponds to Table 7 in the full text.

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Resting ECG for initial diagnostic assessment of SCAD

Recommendations	Class	Level
A resting ECG is recommended in all patients at presentation.	I	C
A resting ECG is recommended in all patients during or immediately after an episode of chest pain suspected to indicate clinical instability of CAD.	I	C

CAD = coronary artery disease; ECG = electrocardiogram; SCAD = stable coronary artery disease.
This slide corresponds to Table 8 in the full text.

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Echocardiography

Recommendations	Class	Level
A resting transthoracic echocardiogram is recommended in all patients for: a) exclusion of alternative causes of angina; b) identification of regional wall motion abnormalities suggestive of CAD; c) measurement of LVEF for risk stratification purpose; d) evaluation of diastolic function.	I	B
Ultrasound of the carotid arteries should be considered to be performed by adaequately trained clinicians to detect increased IMT and/or plaque in patients with suspected SCAD without known atherosclerotic disease.	IIa	C

CAD = coronary artery disease; IMT = intima-media thickness; LVEF = left ventricular ejection fraction; SCAD = stable coronary artery disease.

This slide corresponds to Table 9 in the full text.

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Ambulatory ECG monitoring for initial diagnostic assessment of SCAD

Recommendations	Class	Level
Ambulatory ECG monitoring is recommended in patients with SCAD and suspected arrhythmia.	I	C
Ambulatory ECG monitoring should be considered in patients with suspected vasospastic angina.	IIa	C

ECG = electrocardiogram; SCAD = stable coronary artery disease.
This slide corresponds to Table 10 in the full text.

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CXR for initial diagnostic assessment of SCAD

Recommendations	Class	Level
CXR is recommended in patients with atypical presentation or suspicion of pulmonary disease.	I	C
CXR should be considered in patients with suspected heart failure.	IIa	C

CXR = chest X-ray.
This slide corresponds to Table 11 in the full text.

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Performing an exercise ECG for initial diagnostic assessment of angina or evaluation of symptoms

Recommendations	Class	Level
Exercise ECG is recommended as the initial test for establishing a diagnosis of SCAD in patients with symptoms of angina and intermediate PTP of CAD, free of anti-ischaemic drugs, unless they cannot exercise or display ECG changes which make the ECG non-evaluable.	I	B
Stress imaging is recommended as the initial test option if local expertise and availability permit.	I	B
Exercise ECG should be considered in patients on treatment to evaluate control of symptoms and ischaemia.	IIa	C
Exercise ECG in patients with ≥0.1 mV ST-depression on resting ECG or taking digitalis is not recommended for diagnostic purposes.	III	C

CAD = coronary artery disease; ECG = electrocardiogram; PTP = pre-test probability; SCAD = stable coronary artery disease.
This slide corresponds to Table 14 in the full text.

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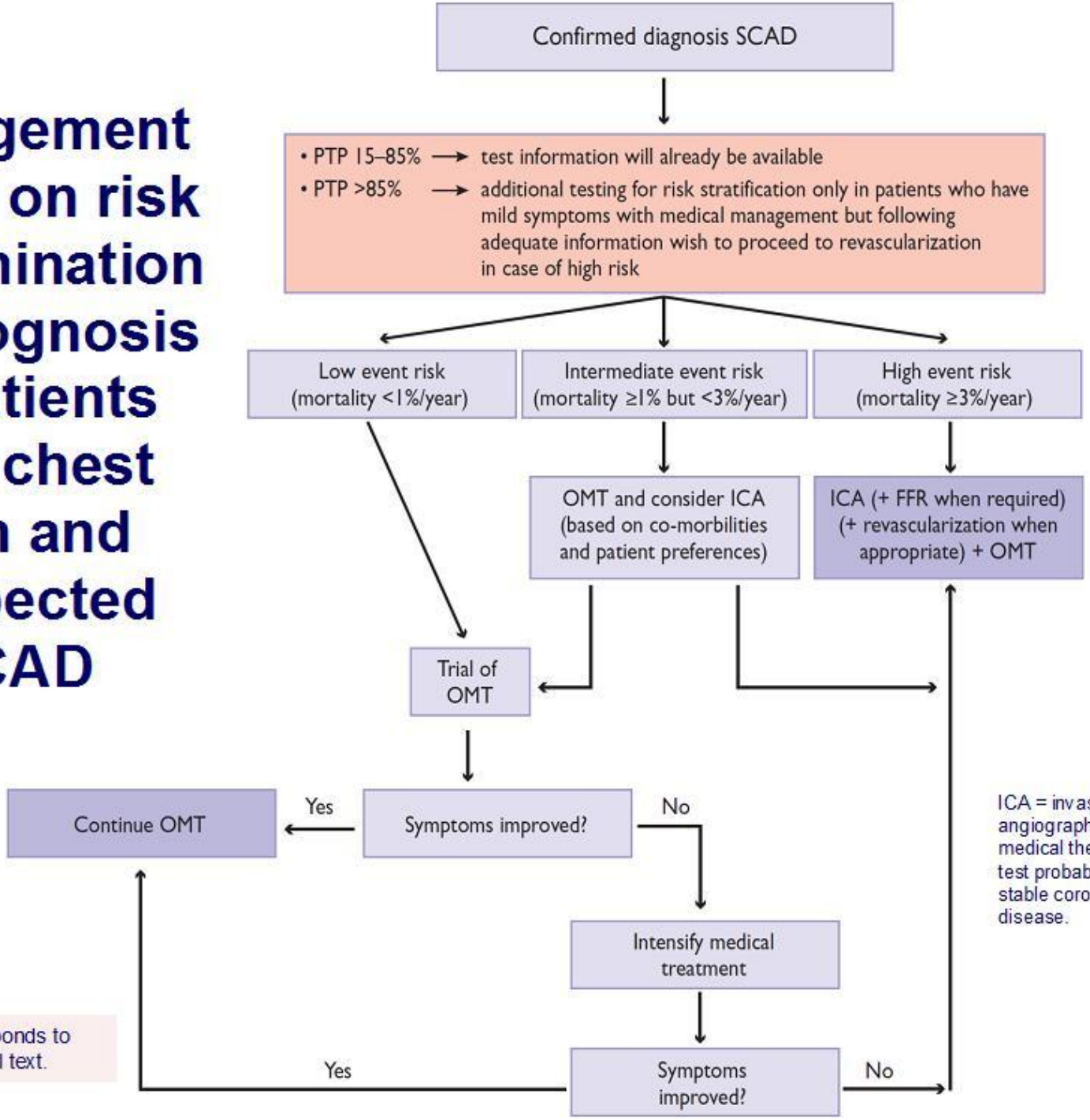
Management based on risk determination for prognosis in patients with chest pain and suspected SCAD



ICA = invasive coronary angiography; OMT = optimal medical therapy; PTP = pre-test probability; SCAD = stable coronary artery disease.

This slide corresponds to Figure 3 in the full text.

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Definitions of risk for various test modalities[a]

Exercise stress ECG[b]	High risk	CV mortality >3%/year.
	Intermediate risk	CV mortality between 1 and 3%/year.
	Low risk	CV mortality <1%/year.
Ischaemia imaging	High risk	Area of ischaemia >10% (>10% for SPECT; limited quantitative data for CMR – probably ≥2/16 segments with new perfusion defects or ≥3 dobutamine-induced dysfunctional segments; ≥3 segments of LV by stress echo).
	Intermediate risk	Area of ischaemia between 1 to 10% or any ischemia less than high risk by CMR or stress echo.
	Low risk	No ischaemia.
Coronary CTA[c]	High risk	Significant lesions of high risk category (three-vessel disease with proximal stenoses, LM, and proximal anterior descending CAD).
	Intermediate risk	Significant lesion(s) in large and proximal coronary artery(ies) but not high risk category.
	Low risk	Normal coronary artery or plaques only.

CAD = coronary artery disease; CMR = cardiac magnetic resonance; CTA = computed tomography angiography; CV = cardiovascular; ECG = electrocardiogram; ICA = invasive coronary angiography; LM = left main; PTP = pre-test probability; SPECT = single photon emission computed tomography.

[a] For detailed explanation on rationale for risk stratification scheme see web addenda.

[b] From nomogram (see web addenda, Figure W1) or http://www.cardiology.org/tools/medcalc/duke/

[c] See Fig 2 in full text – consider possible overestimation of presence of significant multivessel disease by coronary CTA in patients with high intermediate PTP (≥50%) and/or severe diffuse or focal coronary calcifications and consider performing additional stress testing in patients without severe symptoms before ICA.

This slide corresponds to Table 17 in the full text.

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Risk stratification using ischaemia testing

Recommendations	Class	Level
Risk stratification is recommended based on clinical assessment and the result of the stress test initially employed for making a diagnosis of SCAD.	I	B
Stress imaging for risk stratification is recommended in patients with a non-conclusive exercise ECG[a]	I	B
Risk stratification using stress ECG (unless they cannot exercise or display ECG changes which make the ECG non-evaluable) or preferably stress imaging if local expertise and availability permit is recommended in patients with stable coronary disease after a significant change in symptom level.	I	B
Stress imaging is recommended for risk stratification in patients with known SCAD and a deterioration in symptoms if the site and extent of ischaemia would influence clinical decision making.	I	B
Pharmacological stress with echocardiography or SPECT should be considered in patients with LBBB.	IIa	B
Stress echocardiography or SPECT should be considered in patients with paced rhythm.	IIa	B

ECG = electrocardiogram; LBBB = left bundle branch block; SCAD = stable coronary artery disease; SPECT = single photon emission computed tomography.

[a]Stress imaging has usually been performed for establishing a diagnosis of SCAD in most of these patients.

This slide corresponds to Table 19 in the full text.

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Risk stratification by invasive or non-invasive coronary arteriography in patients with SCAD

Recommendations	Class	Level
ICA (with FFR when necessary) is recommended for risk stratification in patients with severe stable angina (CCS 3) or with a clinical profile suggesting a high event risk, particularly if the symptoms are inadequately responding to medical treatment.	I	C
ICA (with FFR when necessary) is recommended for patients with mild or no symptoms with medical treatment in whom non-invasive risk stratification indicates a high event risk and revascularization is considered for improvement of prognosis.	I	C
ICA (with FFR when necessary) should be considered for event risk stratification in patients with an inconclusive diagnosis on non-invasive testing, or conflicting results from different non-invasive modalities.	IIa	C
If coronary CTA is available for event risk stratification, possible overestimation of stenosis severity should be considered in segments with severe calcification, especially in patients at high intermediate PTP. Additional stress imaging may be necessary before referring a patient with few/no symptoms to ICA.	IIa	C

CCS = Canadian Cardiovascular Society; CTA = computed tomography angiography; FFR = fractional flow reserve; ICA = invasive coronary angiography; PTP = pre-test probability; SCAD = stable coronary artery disease.
This slide corresponds to Table 20 in the full text.

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Recommended diet intakes

- Saturated fatty acids to account for <10% of total energy intake, through replacement by polyunsaturated fatty acids.
- Trans unsaturated fatty acids <1% of total energy intake.
- <5 g of salt per day.
- 30-45 g of fibre per day, from wholegrain products, fruits and vegetables.
- 200 g of fruit per day (2–3 servings).
- 200 g of vegetables per day (2–3 servings).
- Fish at least twice a week, one being oily fish.
- Consumption of alcoholic beverages should be limited to 2 glasses per day (20 g/day of alcohol) for men and 1 glass per day (10 g/day of alcohol) for non-pregnant women.

This slide corresponds to Table 25 in the full text.

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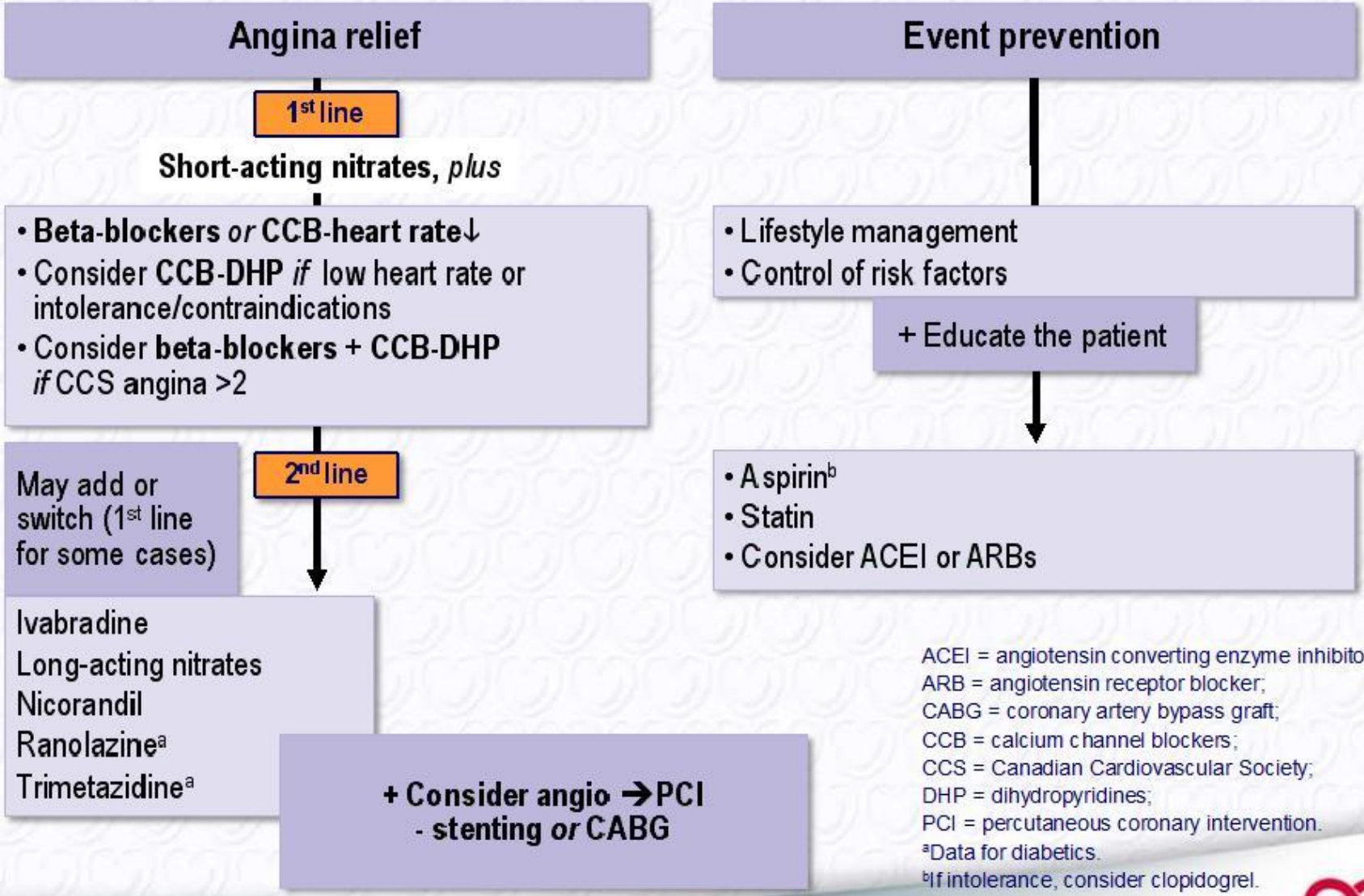
Medical management of patients with SCAD



ACEI = angiotensin converting enzyme inhibitors;
ARB = angiotensin receptor blocker;
CABG = coronary artery bypass graft;
CCB = calcium channel blockers;
CCS = Canadian Cardiovascular Society;
DHP = dihydropyridines;
PCI = percutaneous coronary intervention.
[a]Data for diabetics.
[b]If intolerance, consider clopidogrel.

This slide corresponds to Figure 4 in the full text.

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Pharmacological management

Pharmacological treatments in SCAD patients (1)

Indication	Class	Level
General considerations		
Optimal medical treatment indicates at least one drug for angina/ischemia relief plus drugs for event prevention.	I	C
It is recommended to educate patients about the disease, risk factors and treatment strategy.	I	C
It is indicated to review the patient's response soon after starting therapy.	I	C
Angina/ischaemia[a] relief		
Short-acting nitrates are recommended.	I	B
First-line treatment is indicated with β-blockers and/or calcium channel blockers to control heart rate and symptoms.	I	A
For second-line treatment it is recommended to add long-acting nitrates or ivabradine or nicorandil or ranolazine, according to heart rate, blood pressure and tolerance.	IIa	B
For second-line treatment, trimetazidine may be considered.	IIb	B
According to comorbidities/tolerance it is indicated to use second-line therapies as first-line treatment in selected patients.	I	C

SCAD = stable coronary artery disease.
[a]No demonstration of benefit on prognosis
This slide corresponds to Table 28 in the full text.

Eur Heart J 2013;34:2949–3003. doi:10.1093/eurheartj/eht296

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Pharmacological treatments in SCAD patients (2)

Indication	Class	Level
Angina/ischaemia[a] relief (cont'd)		
In asymptomatic patients with large areas of ischaemia (>10%) β-blockers should be considered.	IIa	C
In patients with vasospastic angina, calcium channel blockers and nitrates should be considered and beta-blockers avoided.	IIa	B
Event prevention		
Low-dose aspirin daily is recommended in all SCAD patients.	I	A
Clopidogrel is indicated as an alternative in case of aspirin intolerance.	I	B
Statins are recommended in all SCAD patients.	I	A
It is recommended to use ACE inhibitors (or ARBs) if presence of other conditions (e.g. heart failure, hypertension or diabetes).	I	A

ACE = angiotensin converting enzyme; ARB = angiotensin receptor blocker.
[a]No demonstration of benefit on prognosis
This slide corresponds to Table 28 in the full text.

Eur Heart J 2013;34:2949–3003. doi:10.1093/eurheartj/eht296

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Treatment in patients with microvascular angina

Recommendations	Class	Level
It is recommended that all patients receive secondary prevention medications including aspirin and statins.	I	B
β-blockers are recommended as a first-line treatment.	I	B
Calcium antagonists are recommended if β-blockers do not achieve sufficient symptomatic benefit or are not tolerated.	I	B
ACE inhibitors or nicorandil may be considered in patients with refractory symptoms.	IIb	B
Xanthine derivatives or non-pharmacological treatments such as neurostimulatory techniques may be considered in patients with symptoms refractory to the above listed drugs.	IIb	B

ACE = angiotensin converting enzyme.
This slide corresponds to Table 29 in the full text.

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Revascularization of SCAD patients on OMT

(Adapted from the ESC/EACTS 2010 Guidelines)

Indication[a]	To improve prognosis		To improve symptoms persistent on OMT	
	Class	Level	Class	Level
A Heart Team approach to revascularization is recommended in patients with unprotected left main, 2–3 vessel disease, diabetes or comorbidities.	I	C	I	C
Left main >50% diameter stenosis.[b]	I	A	I	A
Any proximal LAD >50% diameter stenosis.[b]	I	A	I	A
2–3 vessel disease with impaired LV function/CHF.	I	B	IIa	B
Single remaining vessel (>50% diameter stenosis[b]).	I	C	I	A
Proven large area of ischaemia (>10% LV[c])	I	B	I	B
Any significant stenosis with limiting symptoms or symptoms non responsive/intolerant to OMT.	NA	NA	I	A
Dyspnoea/cardiac heart failure with >10% ischaemia/viability supplied by stenosis >50%.	IIb	B	IIa	B
No limiting symptoms with OMT in vessel other than left main or proximal LAD or single remaining vessel or vessel subtending area of ischaemia <10% of myocardium or with FFR ≥0.80.	III	A	III	C

CHF = congestive heart failure; FFR = fractional flow reserve; LAD = left anterior descending; LV = left ventricular; OMT = optimal medical therapy; SCAD = stable coronary artery disease. [a]In asymptomatic patients, the decision will be guided by the extent of ischaemia on stress testing. [b]With documented ischaemia or FFR <0.80 for angiographic diameter stenoses 50–90%. [c]As assessed by non-invasive test (SPECT, MRI, stress echocardiography).
This slide corresponds to Table 32 in the full text.

Eur Heart J 2013;34:2949–3003. doi:10.1093/eurheartj/eht296

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Follow-up of revascularized SCAD patients (1)

Recommendations	Class	Level
General measures		
It is recommended that all revascularized patients receive a secondary prevention and be scheduled for follow-up visit.	I	A
It is recommended to instruct patients before discharge about return to work and reuptake of full activities. Patients have to be advised to seek immediate medical contact if symptoms (re-)occur.	I	C
Antiplatelet therapy		
SAPT, usually aspirin, is recommended indefinitely.	I	A
DAPT is indicated after BMS for at least 1 month.	I	A
DAPT is indicated for 6 to 12 months after 2nd generation DES.	I	B
DAPT may be used for more than 1 year in patients at high ischaemic risk (e.g. stent thrombosis, recurrent ACS on DAPT, post MI/diffuse CAD) and low bleeding risk.	IIb	B
DAPT for 1 to 3 months may be used after DES implantation in patients at high bleeding risk or with undeferrable surgery or concomitant anticoagulant treatment.	IIb	C

ACS = acute coronary syndrome; BMS = bare-metal stent; CAD = coronary artery disease; DAPT = dual antiplatelet therapy; DES = drug-eluting stent; MI = myocardial infarction; SAPT = single antiplatelet therapy.
This slide corresponds to Table 34 in the full text.

Eur Heart J 2013;34:2949–3003. doi:10.1093/eurheartj/eht296

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Follow-up of revascularized SCAD patients (2)

Recommendations	Class	Level
Imaging management		
In symptomatic patients, stress imaging (stress echocardiography, MRI or MPS) is indicated rather than stress ECG.	I	C
In patients with low risk ischaemic findings (<5% of the myocardium) at stress imaging, optimal medical therapy is recommended.	I	C
In patients with high risk ischaemic findings (>10% of myocardium) at stress imaging, coronary angiography is recommended.	I	C
Late (6 months) stress imaging test after revascularization may be considered to detect patients with restenosis after stenting or graft occlusion irrespective of symptoms.	IIb	C
After high risk PCIs (e.g. LM disease) late (3–12 months) control angiography may be considered, irrespective of symptoms.[a]	IIb	C
Systematic control angiography, early or late after PCI, is not recommended.	III	C

ECG = electrocardiogram; LM = left main; MPS = myocardial perfusion scintigraphy; MRI = magnetic resonance imaging; PCI = percutaneous coronary intervention.

[a]Specific patient subsets indicated for early stress testing:
– patients with safety critical professions (e.g. pilots, drivers, divers) and competitive athletes.
– patients who would like to engage in activities for, which high oxygen consumption is required.

This slide corresponds to Table 34 in the full text.

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Testing in asymptomatic patients at risk for SCAD

Recommendations	Class	Level
In asymptomatic adults with hypertension or diabetes a resting ECG should be considered for CV risk assessment.	IIa	C
In asymptomatic adults at intermediate risk (see SCORE for definition of intermediate risk - www.heartscore.org) measurement of carotid intima-media thickness with screening for atherosclerotic plaques by carotid ultrasound, measurement of ankle-brachial index or measurement of coronary calcium using CT should be considered for CV risk assessment.	IIa	B
In asymptomatic adults with diabetes, 40 years of age and older, measurement of coronary calcium using CT may be considered for CV risk assessment.	IIb	B
In asymptomatic adults without hypertension or diabetes a resting ECG may be considered.	IIb	C
In intermediate-risk asymptomatic adults (see SCORE for definition of intermediate risk - www.heartscore.org), (including sedentary adults considering starting a vigorous exercise programme), an exercise ECG may be considered for CV risk assessment particularly when attention is paid to non-ECG markers such as exercise capacity.	IIb	B
In asymptomatic adults with diabetes or asymptomatic adults with a strong family history of CAD or when previous risk assessment testing suggests high risk of CAD, such as a coronary artery calcium score of 400 or greater stress imaging tests (MPI, stress echocardiography, perfusion CMR) may be considered for advanced CV risk assessment.	IIb	C
In low- or intermediate-risk (based on SCORE) asymptomatic adults stress imaging tests are not indicated for further CV risk assessment.	III	C

CAD = coronary artery disease; CMR = cardiac magnetic resonance; CT = computed tomography; CV = cardiovascular; MPI = myocardial perfusion imaging; SCORE = systematic coronary risk evaluation.
This slide corresponds to Table 21 in the full text.

Eur Heart J 2013;34:2949–3003. doi:10.1093/eurheartj/eht296

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Reassessment in patients with SCAD

Recommendations	Class	Level
Follow-up visits are recommended every 4–6 months in the first year following institution of therapy for SCAD which may be extended to1 year afterwards. Visits should be to the general practitioner who may refer to the cardiologist in case of uncertainty. These visits should include a careful history and biochemical testing as clinically appropriate.	I	C
An annual resting ECG is recommended and an additional ECG if a change in anginal status occurred or symptoms suggesting an arrhythmia appeared or medication has been changed which might alter electrical conduction.	I	C
An exercise ECG or stress imaging if appropriate is recommended in the presence of recurrent or new symptoms once instability has been ruled out.	I	C
Reassessment of the prognosis using stress testing may be considered in asymptomatic patients after the expiration of the period for which the previous test was felt to be valid ("warranty period").	IIb	C
Repetition of an exercise ECG may only be considered after at least 2 years following the last test (unless there is a change in clinical presentation).	IIb	C

ECG = electrocardiogram; SCAD = stable coronary artery disease.
This slide corresponds to Table 22 in the full text.

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Thank you for attention!