HITNA STANJA U KARDIOLOGIJI

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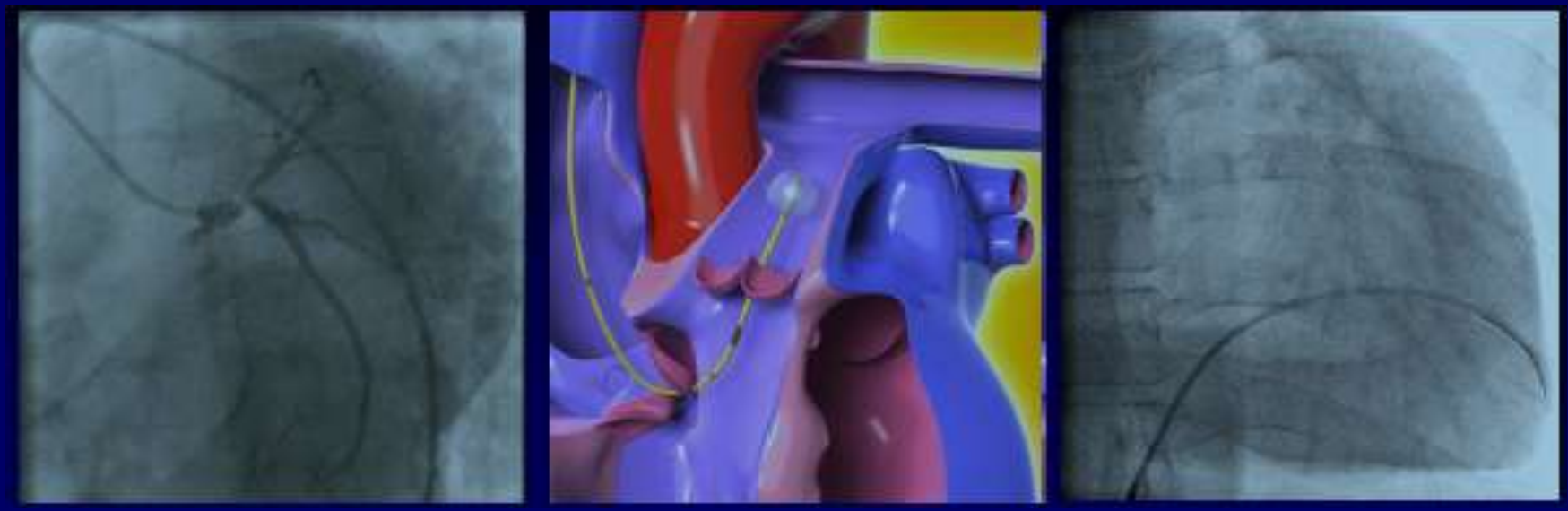
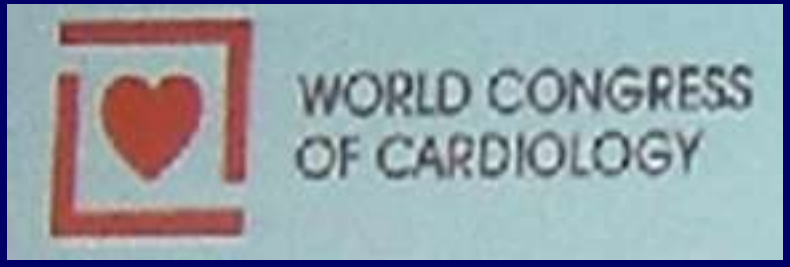
Srbija



Cardiovascular Disease

Cardiovascular Disease is responsible for 17,5 million deaths per year

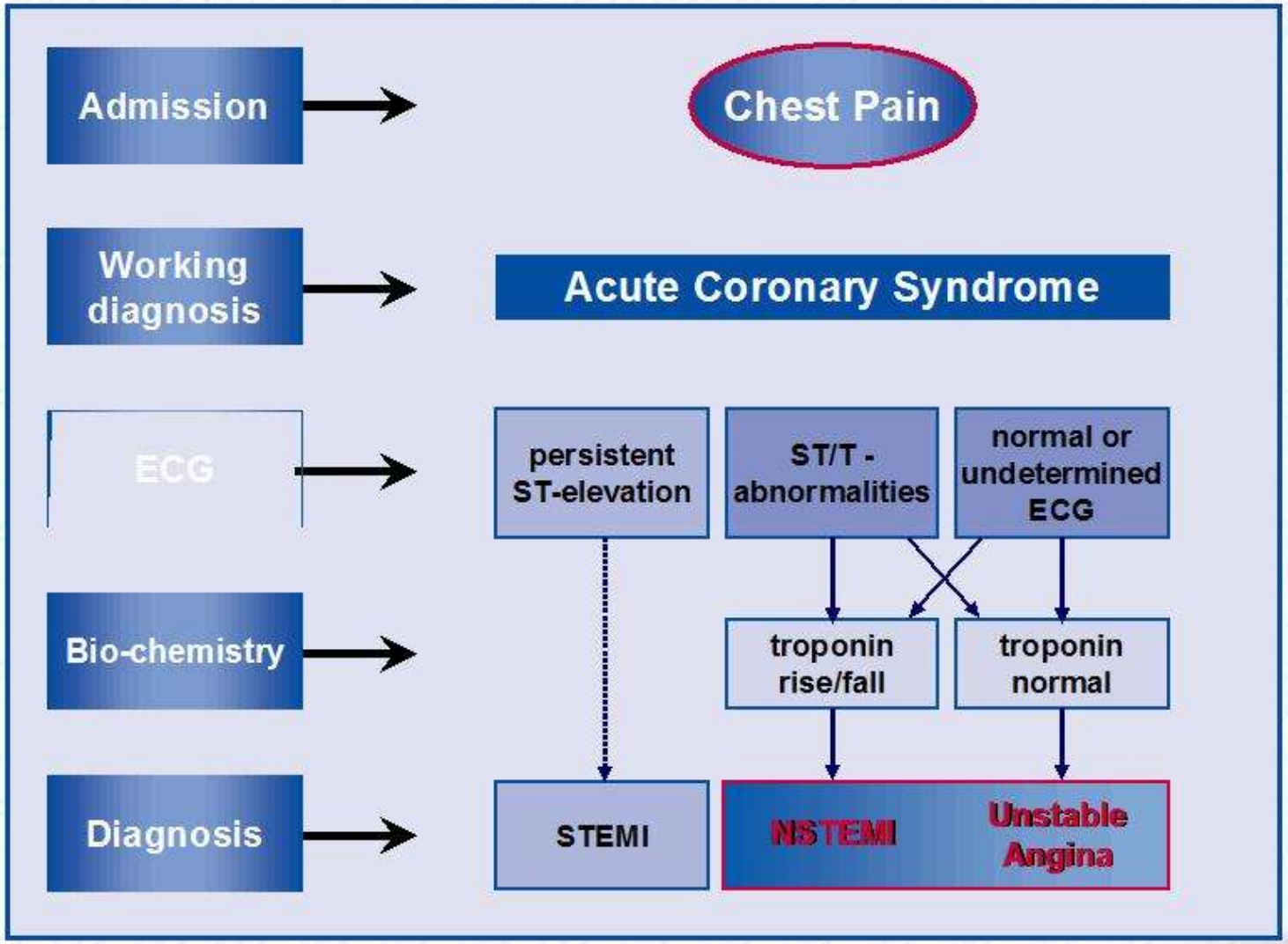
80% of deaths occur in low - and middle – income countries



HITNA STANJA U KARDIOLOGIJI

Svako KV oboljenje jednog trenutka može biti urgentno!

- Akutni infarkt miokarda
- Akutna srčana insuficijencija
- Hipertenzivna kriza
- Disekcija aorte
- Plućna embolija
- Maligne aritmije i poremećaji sprovođenja
- Tamponada srca



European Heart Journal (2011) 32:2999–3054
doi:10.1093/eurheartj/ehr236

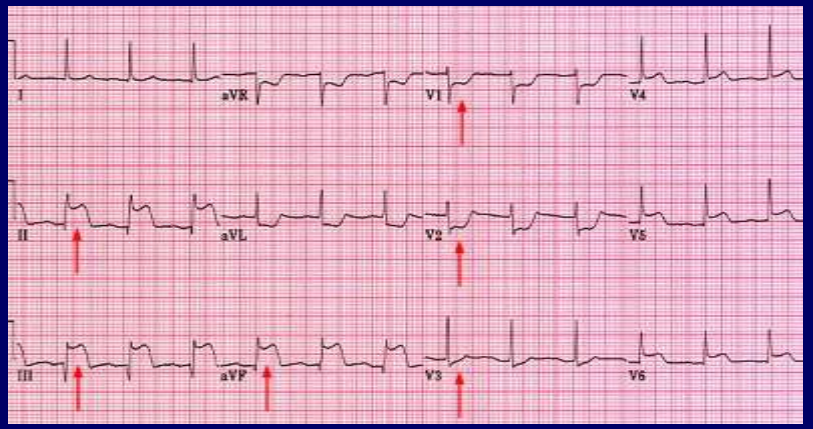
AKUTNI INFARKT MIOKARDA

ESC Guidelines 2012

Table 3 Universal definition of myocardial infarction[a]

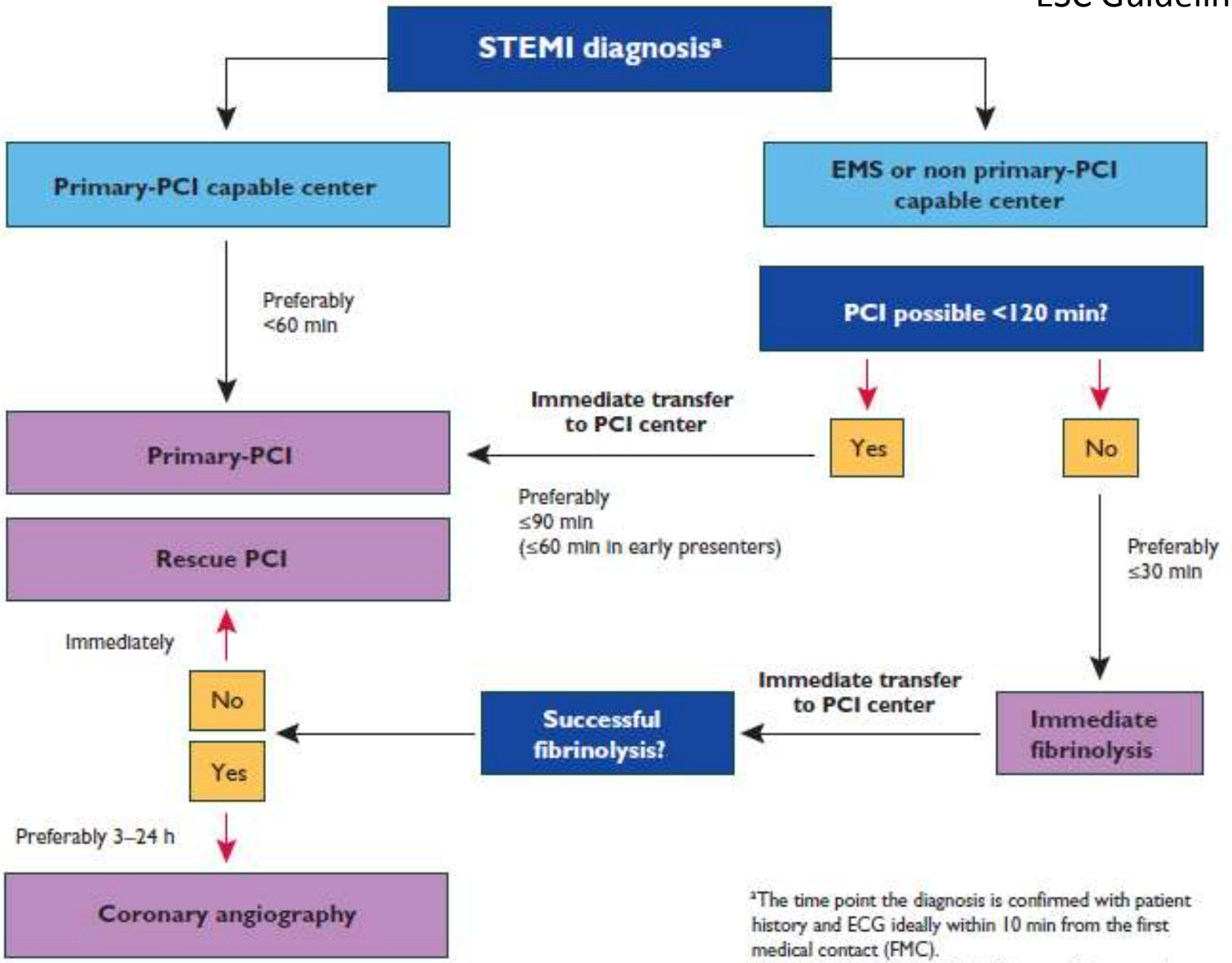
Detection of rise and/or fall of cardiac biomarker values (preferably troponin) with at least one value above the 99th percentile of the upper reference limit and with at least one of the following: • Symptoms of ischaemia; • New or presumably new significant ST-T changes or new LBBB; • Development of pathological Q waves in the ECG; • Imaging evidence of new loss of viable myocardium, or new regional wall motion abnormality; • Identification of an intracoronary thrombus by angiography or autopsy.
Cardiac death with symptoms suggestive of myocardial ischaemia, and presumably new ECG changes or new LBBB, but death occurring before blood cardiac biomarkers values are released or before cardiac biomarker values would be increased.
Stent thrombosis associated with MI when detected by coronary angiography or autopsy in the setting of myocardial ischaemia and with a rise and/or fall of cardiac biomarker values with at least one value above the 99th percentile URL.

ECG = electrocardiogram; LBBB = left bundle branch block.
[a]Excluding myocardial infarction associated with revascularization procedures or criteria for prior myocardial infarction.



Prehospital and in-hospital management, and reperfusion strategies within 24 h of FMC

ESC Guidelines 2012



New recommendations for PCI in STEMI

Indication	Time from FMC	Class	Level
PCI after fibrinolysis: Routine urgent PCI is indicated after successful fibrinolysis (resolved chest pain/discomfort and ST-segment elevation).	Within 24 h	I	A
Rescue PCI should be considered in patients with failed fibrinolysis.	As soon as possible	IIa	A

- In order to reduce delay for patients with no reperfusion, transfer to PCI center of all post-fibrinolysis patients is recommended.

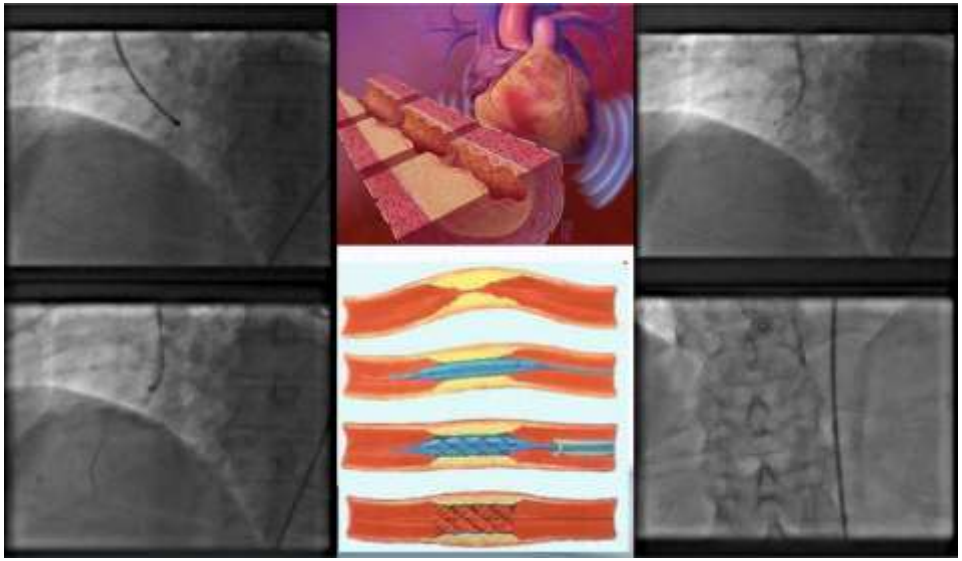
European Heart Journal (2010) 31, 2501-2555
European Journal of Cardio-thoracic Surgery (2010) 38, S1-S52

www.escardio.org/guidelines

Joint 2010 ESC - EACTS Guidelines on Myocardial Revascularisation

EACTS

EUROPEAN SOCIETY OF CARDIOLOGY



Recommendations for PCI in STEMI

- Cities and countries switching from fibrinolysis to primary PCI have observed a sharp decrease in mortality after STEMI
- There is a strong inverse volume-outcome relationship observed in high-risk and emergency PCI. These procedures should be performed in high-volume, experienced centres.
- Tolerance of low-volume thresholds for PCI centres for the purpose of providing primary PCI is not recommended.

European Heart Journal (2010) 31, 2501-2555
European Journal of Cardio-thoracic Surgery (2010) 38, S1-S52

www.escardio.org/guidelines

Joint 2010 ESC - EACTS Guidelines on Myocardial Revascularisation

EACTS

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AKUTNI INFARKT MIOKARDA

ESC Guidelines 2012

Table 6 Recommendations for relief of pain, breathlessness and anxiety

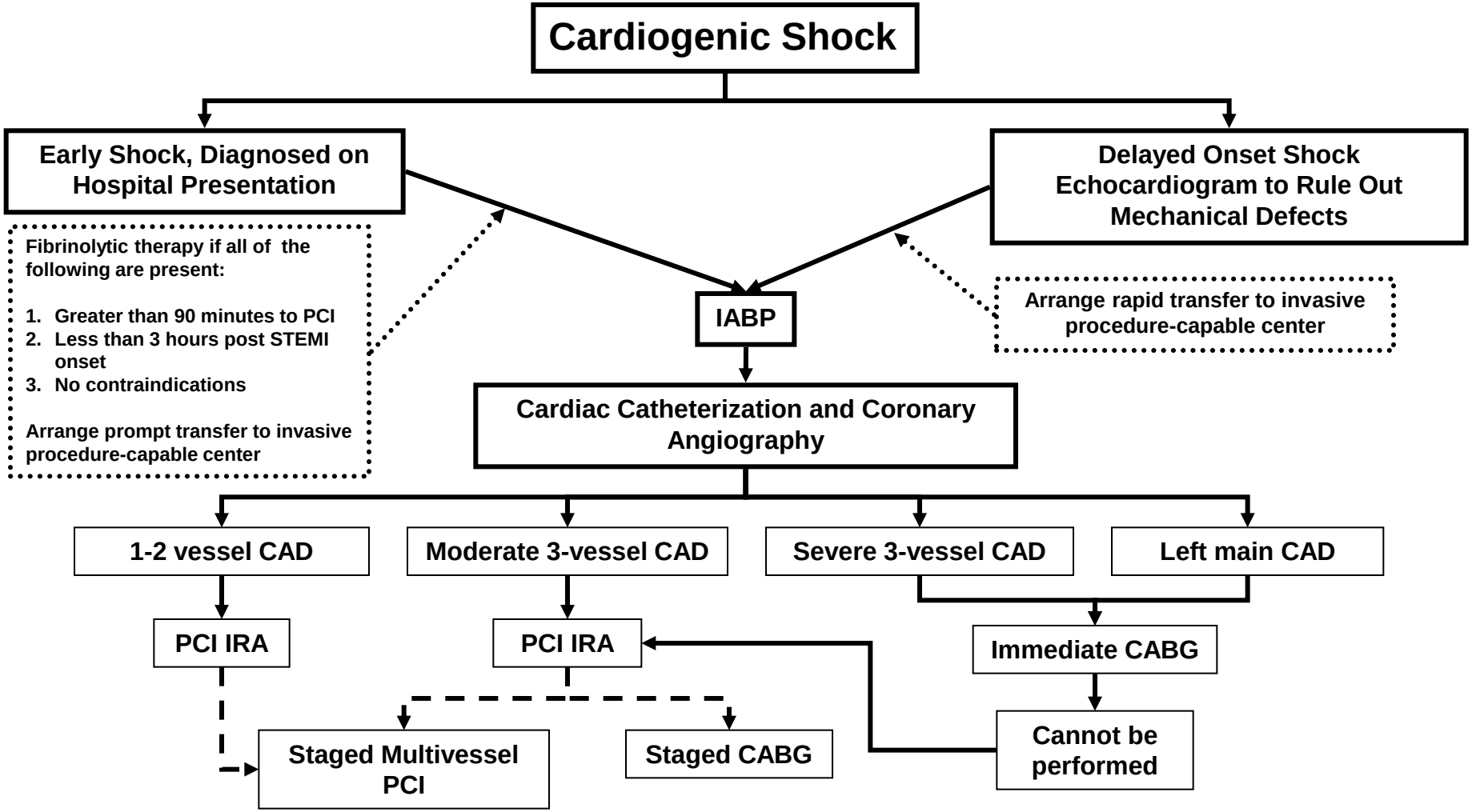
Recommendations	Class [a]	Level [b]
Titrated i.v. opioids are indicated to relieve pain.	I	C
Oxygen is indicated in patients with hypoxia (SaO_2 <95%), breathlessness, or acute heart failure.	I	C
Tranquillizer may be considered in very anxious patients.	IIa	C

i.v. = intravenous; SaO_2 = saturated oxygen.
[a]Class of recommendation.
[b]Level of evidence.

- Aspirin 300mg
- Clopidogrel 300mg (600mg)

- Nitrati
- Statin
- Beta blokatori
- Nisko molekularni heparin

PCI for Cardiogenic Shock



Performance measures in NSTEMI patients

• Use of aspirin.
• Use of clopidogrel/prasugrel/ticagrelor.
• Use of UFH/enoxaparin/fondaparinus/bivalirudin.
• β-Blocker at discharge in patients with LV dysfunction.
• Use of statins.
• Use of ACE-inhibitor or ARB.
• Use of early invasive procedures in intermediate- to high-risk patients.
• Smoking cessation advice/counselling.
• Enrolment in a secondary prevention/cardiac rehabilitation programme.

European Heart Journal (2011) 32:2999–3054
doi:10.1093/eurheartj/ehr236

Principle of ACS management

- **Revascularization**
  - **Medical**
  - **Balloon**
  - **CABG**
- **Medication for ischemia**
- **Modified risk factors**
- **Treatment of complication**

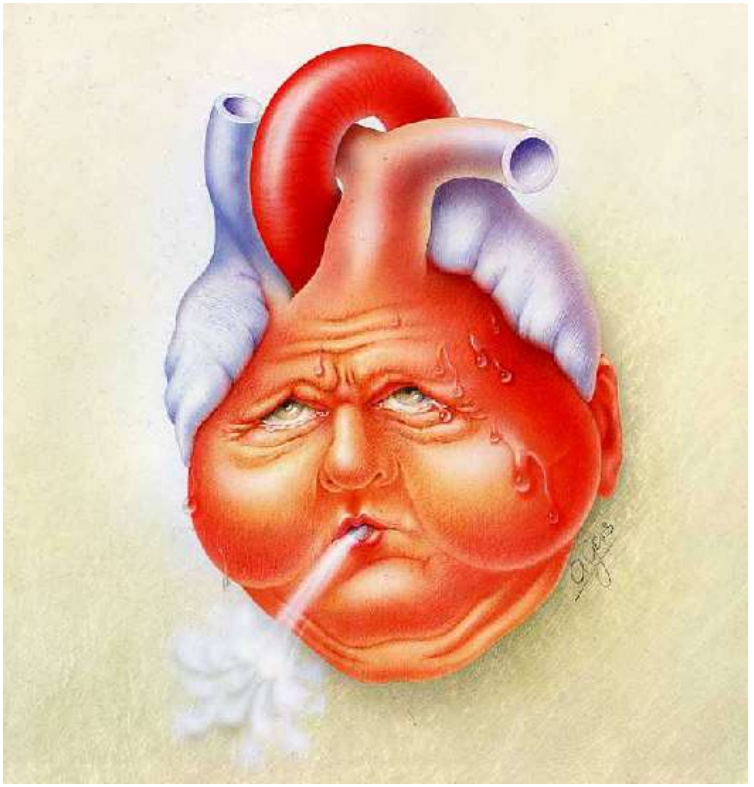
TIME IS MUSCLE AND MUSCLE IS TIME

- decrease area infarction
- prevent LV dysfunction
- decrease mortality

Factor of revascularization

Timing of symptoms
Timing of treatments
Patient condition
Medical limitation
Instrument limitation
Personal limitation

AKUTNA SRČANA INSUFICIJENCIJA

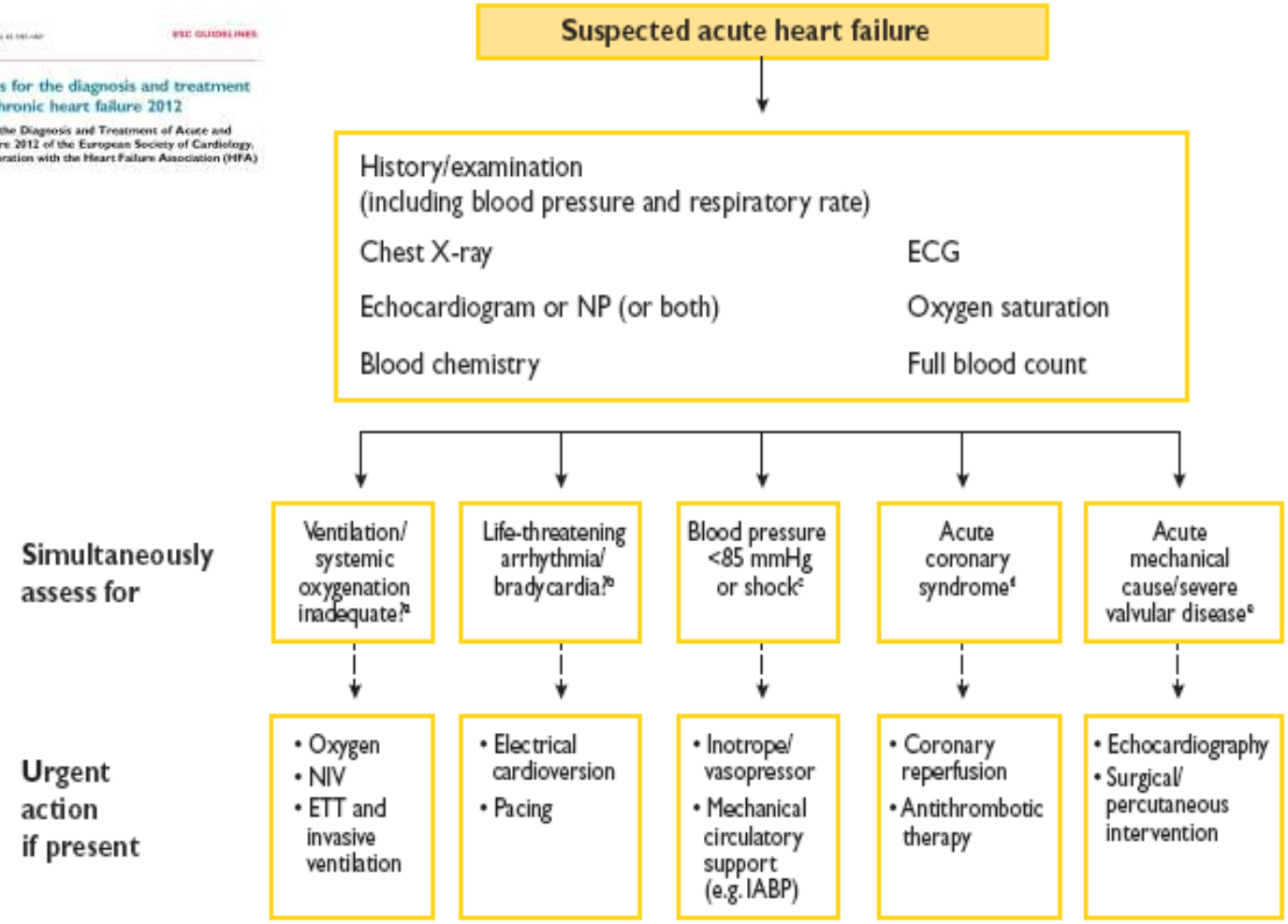


Po život opasno stanje koje zahteva hitnu terapiju i najčešće hospitalizaciju.

ESC GUIDELINES

ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012

The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association (HFA) of the ESC



ECG = electrocardiogram; ETT = endotracheal tube; IABP = intra-aortic balloon pump; NIV = non-invasive ventilation; NP = natriuretic peptide.

[a]For example, respiratory distress, confusion SpO_2 <90%, or PaO_2 <60 mmHg (8.0 kPa).

[b]For example, ventricular tachycardia, third-degree atrioventricular block.

[c]Reduced peripheral and vital organ perfusion—patients often have cold skin and urine output ≤15 ml/h and/or disturbance of consciousness.

[d]Percutaneous coronary revascularization (or thrombolysis) indicated if ST-segment elevation or new left bundle branch block.

[e]Vasodilators should be used with great caution, and surgery should be considered for certain acute mechanical complications (e.g. inter-ventricular septal rupture, mitral valve papillary muscle rupture).

Figure 4 Initial assessment of patient with suspected acute heart failure. ECG = electrocardiogram; ETT = endotracheal tube; IABP = intra-aortic balloon pump; NIV = non-invasive ventilation; NP = natriuretic peptide.

European Heart Journal (2012) 33, 1787–1847
doi:10.1093/eurheartj/ehs104

ESC GUIDELINES

ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012

The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association (HFA) of the ESC

Table 22 Goals of treatment in acute heart failure

Immediate (ED/ICU/CCU)
• Treat symptoms
• Restore oxygenation
• Improve haemodynamics and organ perfusion
• Limit cardiac and renal damage
• Prevent thrombo-embolism
• Minimize ICU length of stay
Intermediate (in hospital)
• Stabilize patient and optimize treatment strategy
• Initiate and up-titrate disease-modifying pharmacological therapy
• Consider device therapy in appropriate patients
• Identify aetiology and relevant co-morbidities
Pre-discharge and long-term management
• Plan follow-up strategy
• Enrol in disease management programme, educate, and initiate appropriate lifestyle adjustments
• Plan to up-titrate/optimize dose of disease-modifying drugs
• Ensure assessed for appropriate device therapy
• Prevent early readmission
• Improve symptoms, quality of life, and survival

CCU = coronary care unit; ED = emergency department; ICU = intensive care unit.

HIPERTENZIVNA KRIZA

Akutno, izrazito i protrahirano povećanje vrednosti KP, često životno ugrožavajuće.

TA ≥ 180 / 120(130-140) mmHg

Kaplan N, Rose B. UpToDate 2008

Hipertenzivna kriza

I RED HITNOSTI

Pored vrlo visokog krvnog pritiska, prisutna su:

- Akutna oštećenja ciljnih organa: CVI, encefalopatija,edem pluća,srčana insuficijencija,bubrežna insuf.,retinopatija

II RED HITNOSTI

Prisutne su visoke ili vrlo visoke vrednosti krvnog pritiska, ali bez simptoma i znakova oštećenja ciljnih organa

- Mogu postojati simptomi: glavobolja, kratak dah, epistaksa, anksioznost

Zajednički principi lečenja hipertenzivnih kriza

- Prepoznati i potvrditi hipertenzivnu krizu
- Proceniti stanje svesti
- Proceniti hemodinamsko stanje
- Uraditi standardni EKG sa 12 odvoda
- Procena individualnog ukupnog KV rizika
- Započeti medikamentnu terapiju
- Vrednosti KP obarati postepeno,nikad naglo

Lečenje HT krize I reda hitnosti

- **Lečenje započeti u primarnoj zdravstvenoj zaštiti**

  - **Furosemid** (20 mg i.v.; u slučaju edema pluća dati do 80 mg)
  - **NTG** (1 mg i.v.; nastaviti sa infuzijom 5-100 µg/min); kontraindikovan u slučaju hipertenzivne encefalopatije
  - **Kaptopril** subling. 12,5-50mg(75mg)
  - **Urapidil** (12,5 mg i.v. tokom 30 sekundi; izostanak efekata, ponavljati istu dozu svakih 5 minuta, do max 50 mg).
  - **sedativ per os,** (lorazepam – sažvakati tabletu od 1 mg, u nedostatku ampuliranog oblika leka).

I red hitnosti *posle započete terapije odmah* uputiti uz adekvatan transport i pratnju u odgovarajuću ustanovu

Kaplan N, Rose B.UpToDate .2008-2011

HIPERTENZIVNA KRIZA: II RED HITNOSTI

- Lečenje započeti i završiti na nivou primarne zdravstvene zaštite, zatim korigovati postojeću terapiju

- Peroralni lekovi
- Sniženje KP progresivno ali postepeno
- Ciljna vrednost KP $\leq$160 / 100mmHg (za 6h)
- Najčešće nije potrebna hospitalizacija

Lečenje HTN krize II reda hitnosti

Odmor u mirnoj sobi u ležećem položaju

Lorazepam 1-2,5mg sublinvalno

+

Furosemid (20-40 mg = ½ do 1 tablete, u slučaju lošeg odgovora do 80 mg)

+

Kaptopril 12,5mg subling ili per os (max.75mg)

+

Felodipin 5mg per os

Kaplan N, Rose B.UpToDate .2008-2011.

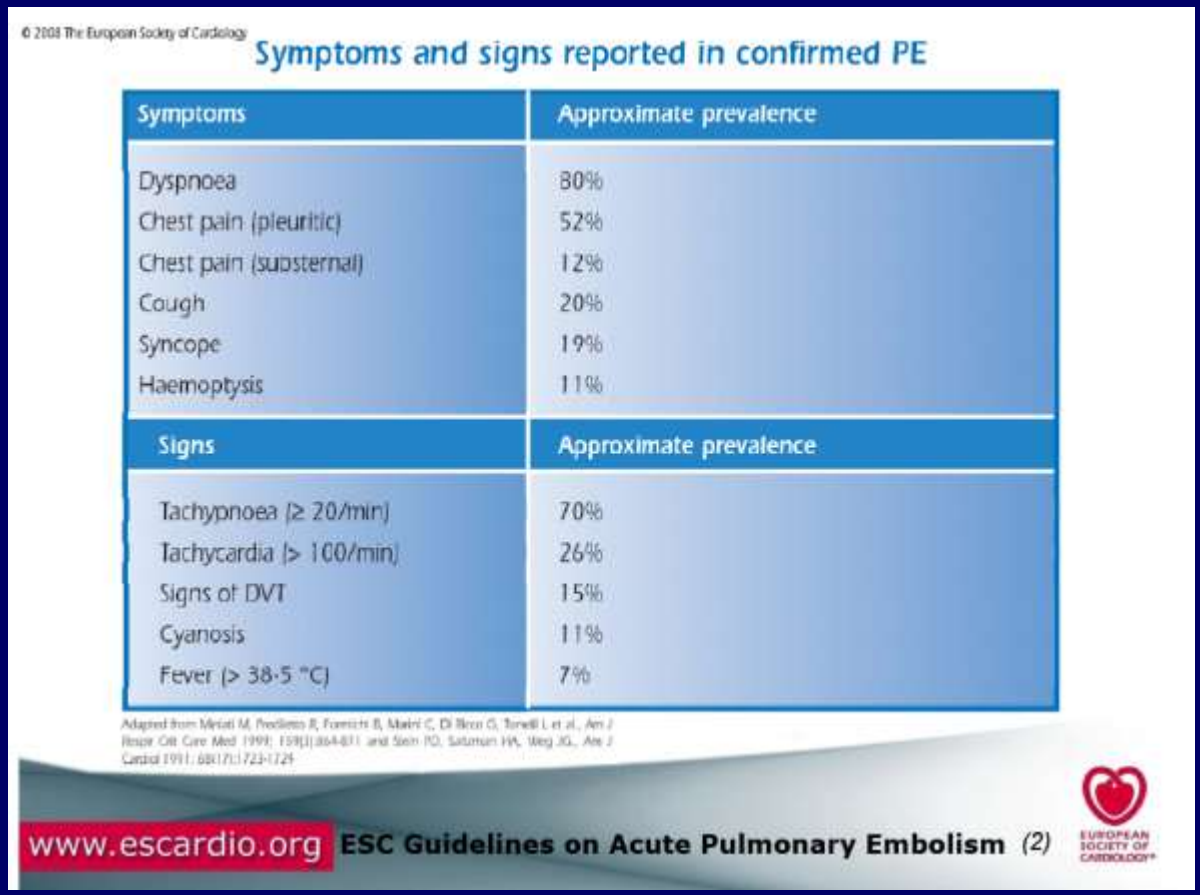
Plućni embolizam (PE)

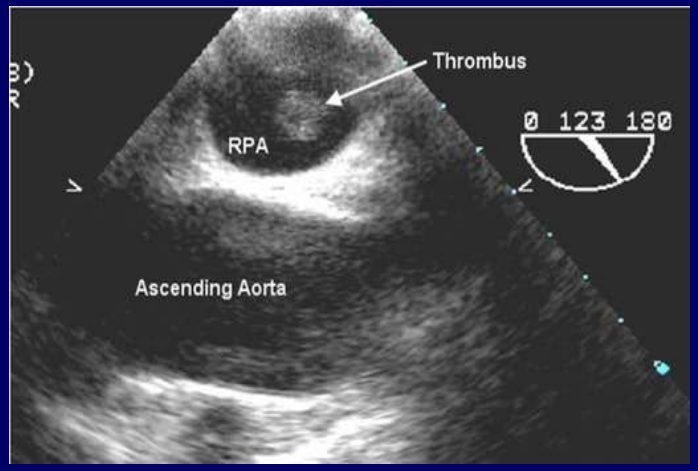
PE - često neprepoznata pre smrti

- Postmortem studije pokazale su da je samo 30 – 45% umrlih usled PE imalo korektnu zaživotno postavljenu dijagnozu

SIMPTOMI I ZNACI PE

- Akutna dispneja
- Pleuritični bol/trenje
- Bol u grudima
- Hipoksija $SatO_2$ < 90%
- Hemoptizije
- Sinkopa





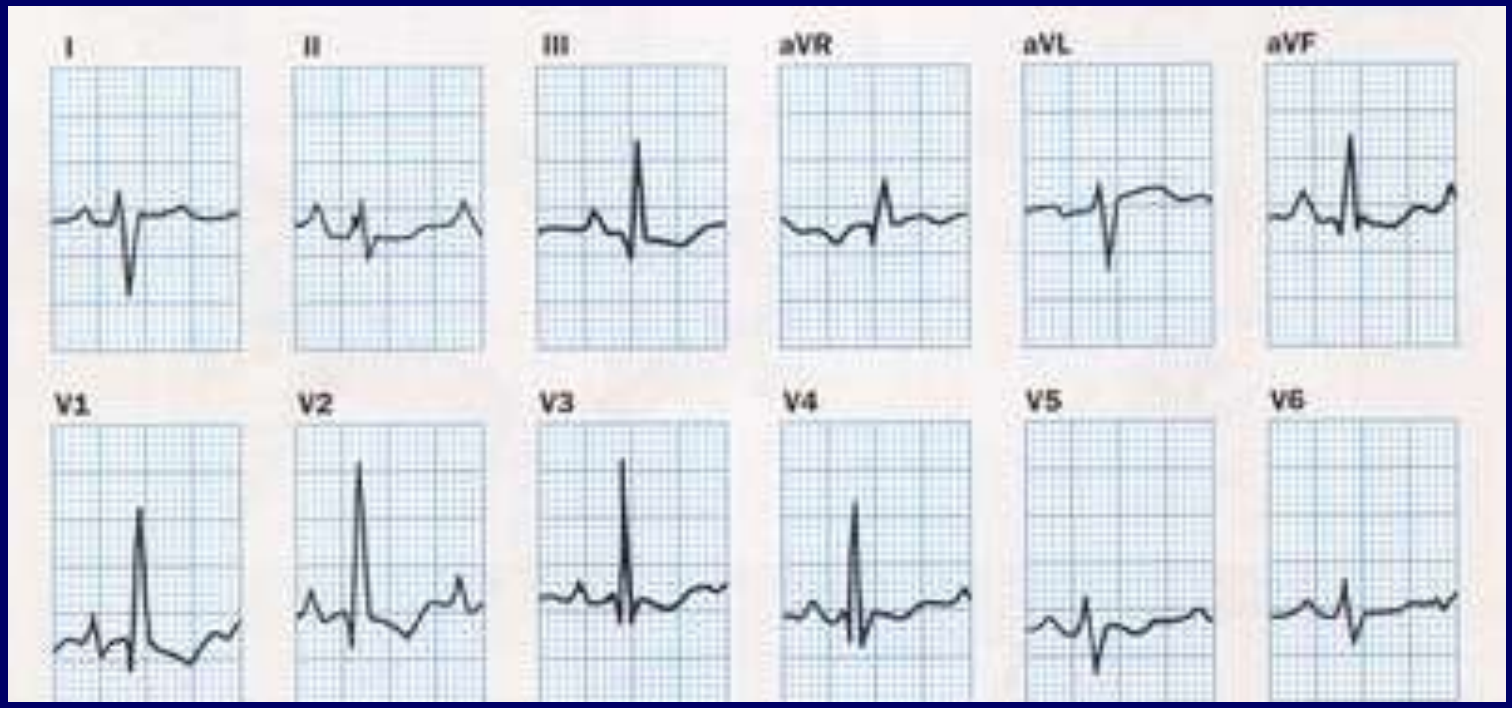
PE

Classic Findings: S1 Q3 T3 (seen in under 20% of cases)

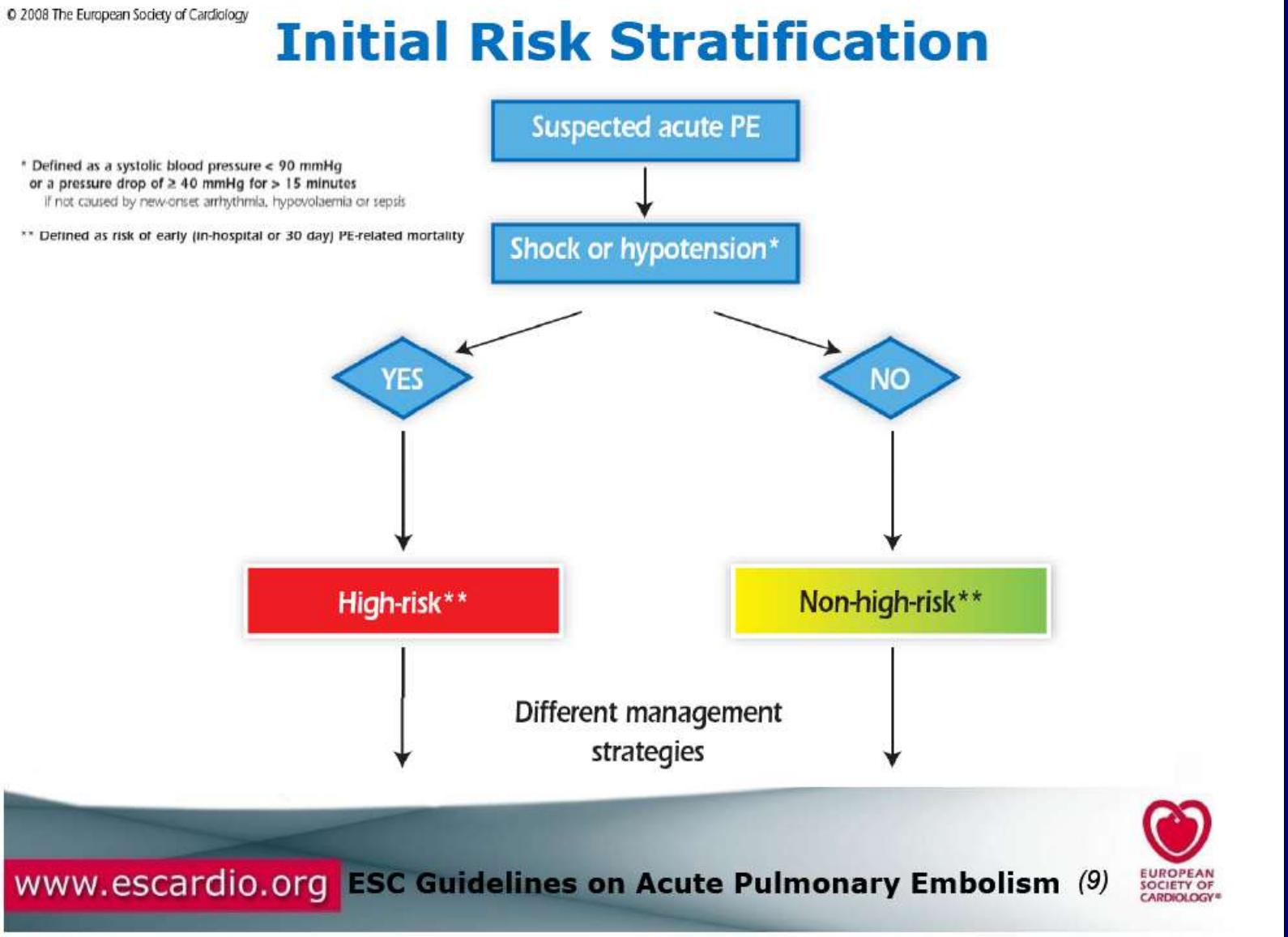
1. S Wave in Lead I
2. Q Wave in Lead III
3. T Wave Inversion in Lead III

Common Findings

1. Sinus Tachycardia
2. Right sided strain pattern
    a. Right Bundle Branch Block
    b. Right Axis Deviation
3. Findings that mimic Myocardial Infarction
    a. ST segment changes
    b. T Wave changes
4. Atrial Fibrillation (new onset)

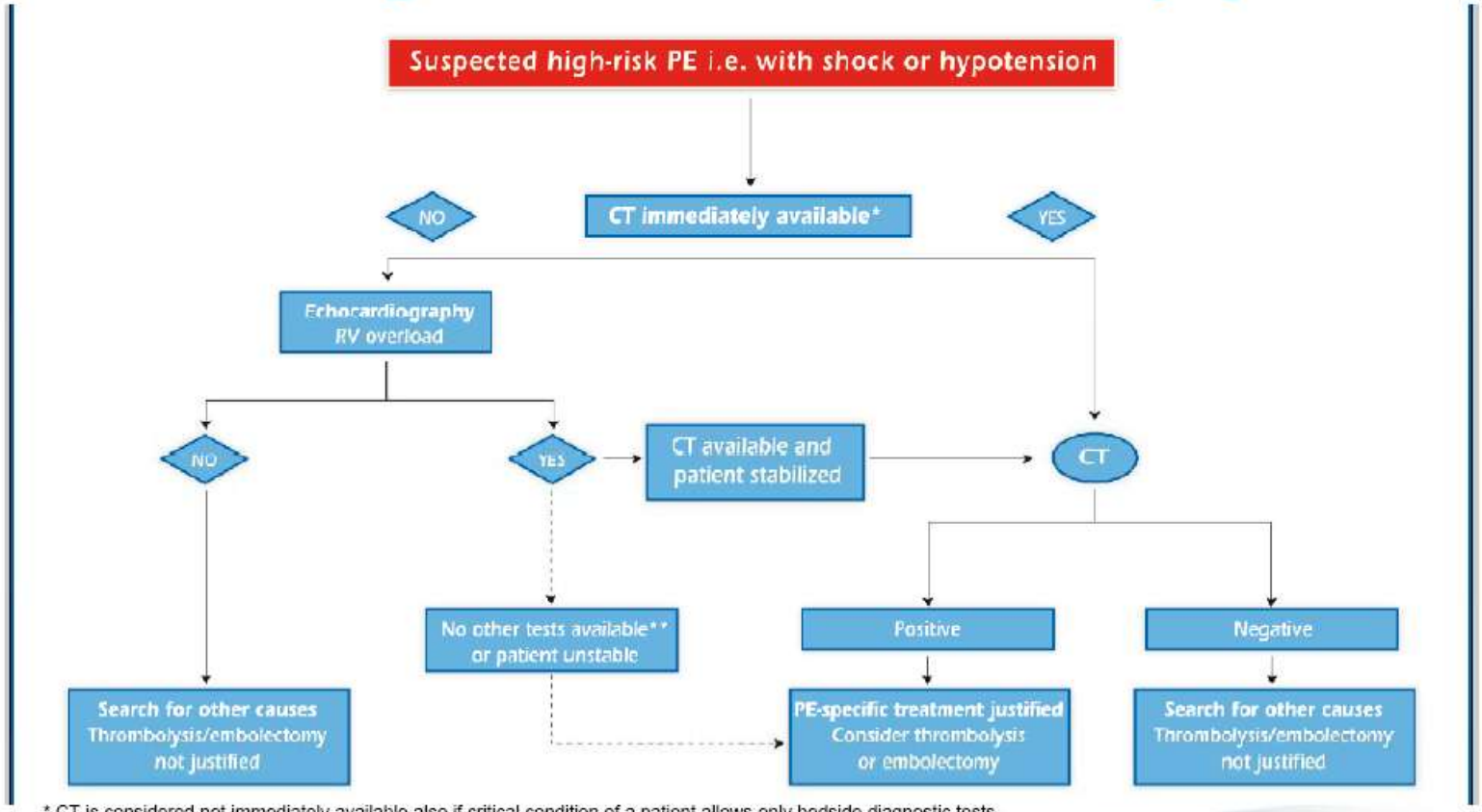


AKUTNA PE


© 2008 The European Society of Cardiology
Initial Risk Stratification
Suspected acute PE
* Defined as a systolic blood pressure < 90 mmHg
or a pressure drop of ≥ 40 mmHg for > 15 minutes
if not caused by new-onset arrhythmia, hypovolaemia or sepsis
** Defined as risk of early (in-hospital or 30 day) PE-related mortality
Shock or hypotension*
YES
NO
High-risk**
Non-high-risk**
Different management strategies
www.escardio.org
ESC Guidelines on Acute Pulmonary Embolism (9)
EUROPEAN SOCIETY OF CARDIOLOGY

PLUĆNA EMBOLIJA

Diagnostic Assessment (1)



* CT is considered not immediately available also if critical condition of a patient allows only bedside diagnostic tests.
** Note that transesophageal echocardiography may detect thrombi in the pulmonary arteries in a significant proportion of patients with RV overload and PE ultimately confirmed at spiral CT and that confirmation of DVT with bedside CUS might also help in decision making.

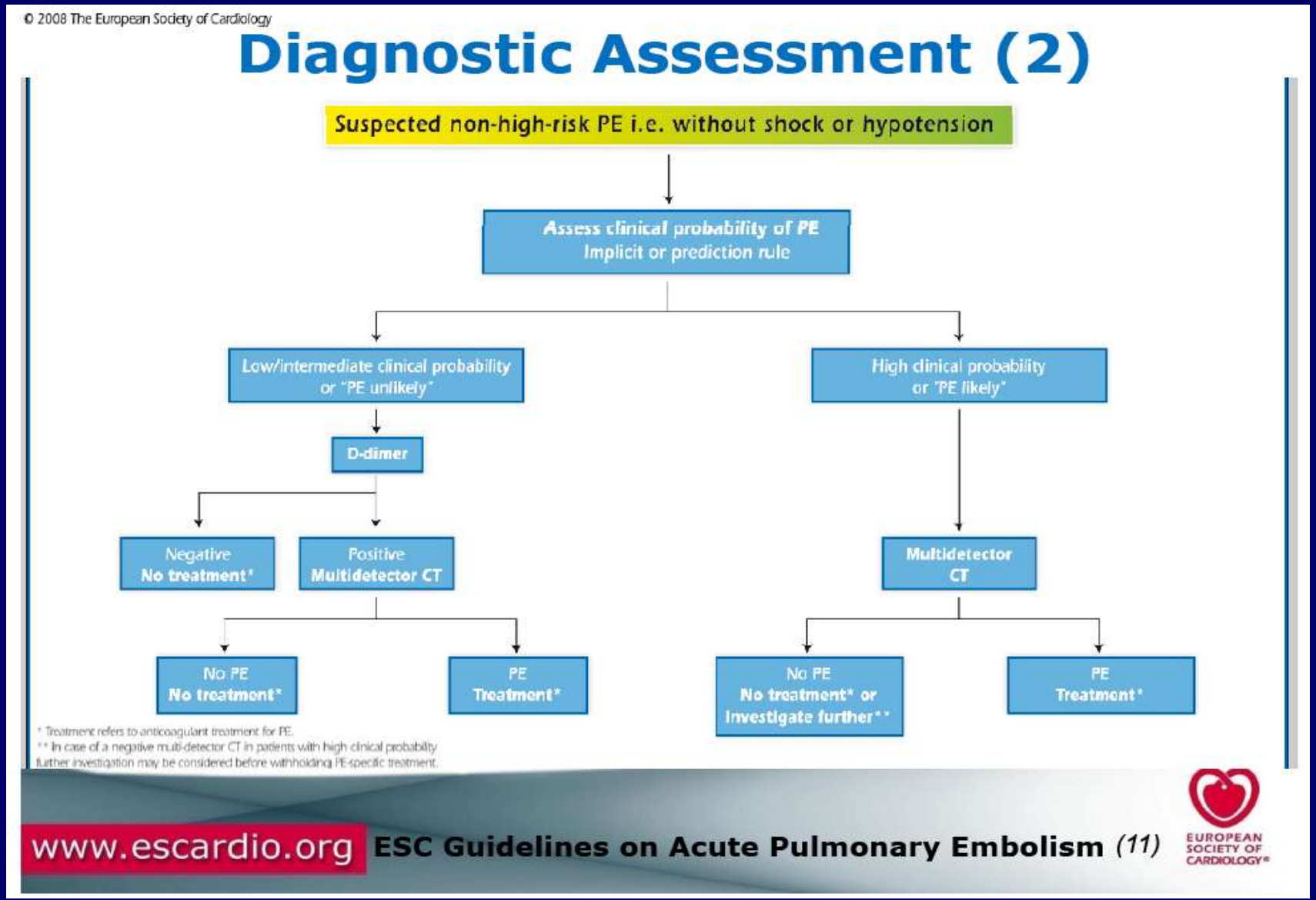
PLUĆNA EMBOLIJA

Initial Treatment

High-risk PE

Recommendations	Class [a]	Level [b]
▪ Anticoagulation with UFH should be initiated without delay in patients with high-risk PE	I	A
▪ Systemic hypotension should be corrected to prevent progression of RV failure and death due to PE	I	C
▪ Vasopressive drugs are recommended for hypotensive patients with PE	I	C
▪ Dobutamine and dopamine may be used in patients with PE. low cardiac output and normal blood pressure	IIa	B
▪ Aggressive fluid challenge is not recommended	III	B
▪ Oxygen should be administered to patients with hypoxaemia	I	C
▪ Thrombolytic therapy should be used in patients with high-risk PE presenting with cardiogenic shock and/or persistent arterial hypotension	I	A
▪ Surgical pulmonary embolectomy is a recommended therapeutic alternative in patients with high-risk PE in whom thrombolysis is absolutely contraindicated or has failed	I	C
▪ Catheter embolectomy or fragmentation of proximal pulmonary arterial clots may be considered as an alternative to surgical treatment in high-risk patients when thrombolysis is absolutely contraindicated or has failed	IIb	C

PLUĆNA EMBOLIJA



Non-high-risk PE

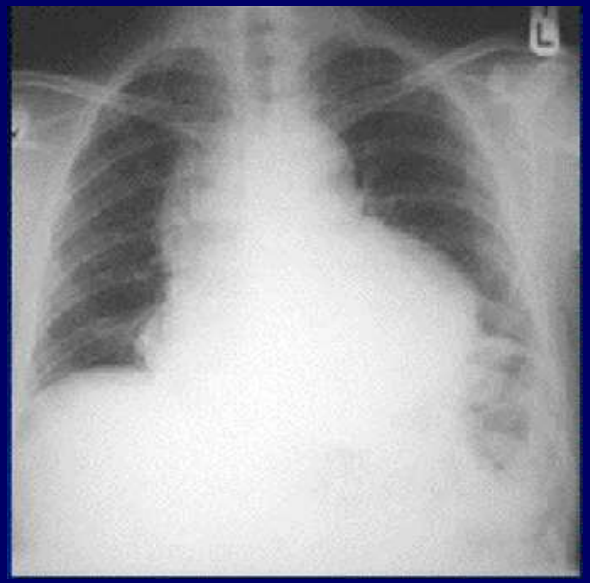
Recommendations	Class [a]	Level [b]
▪ Anticoagulation should be initiated without delay in patients with high or intermediate clinical probability of PE while diagnostic work-up is still ongoing	I	C
▪ Use of LMWH or fondaparinux is the recommended form of initial treatment for most patients with non-high-risk PE	I	A
▪ In patients at high bleeding risk and in those with severe renal dysfunction UFH with an aPTT target range of 1.5 – 2.5 times normal is a recommended form of initial treatment	I	C
▪ Initial treatment with UFH, LMWH or fondaparinux should be continued for at least 5 days and may be replaced by Vit K antagonists only after achieving target INR levels for at least 2 consecutive days	I I	A C
▪ Routine use of thrombolysis in non–high-risk PE patients is not recommended, but it may be considered in selected patients with intermediate-risk PE	IIb	B
▪ Thrombolytic therapy should not be used in patients with low-risk PE	III	B

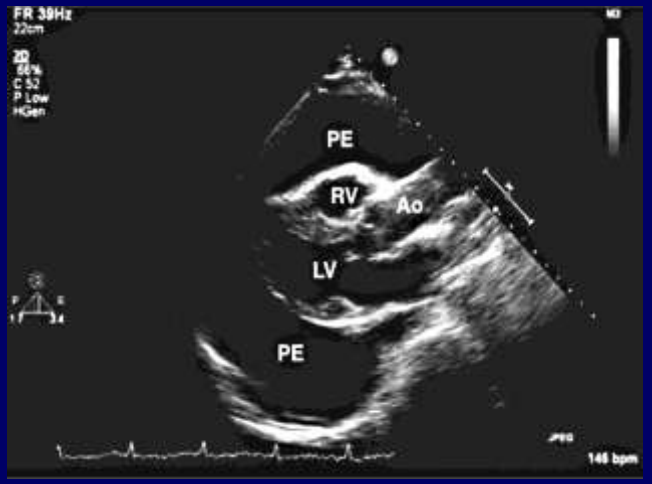
Subcutaneous regimens of low molecular-weight heparins and fondaparinux approved for the treatment of PE

	Dosage	Interval
Enoxaparin	1.0 mg/kg or 1.5 mg/kg*	Every 12 h Once daily*
Tinzaparin	175 U/kg	Once daily
Fondaparinux	5 mg (body weight < 50 kg); 7.5 mg (body weight 50-100 kg); 10 mg (body weight > 100 kg)	Once daily

* Once-daily injection of enoxaparin at the dosage of 1.5 mg/kg is approved for inpatient (hospital) treatment of PE in the United States and in some, but not all, European countries

TAMPONADA SRCA





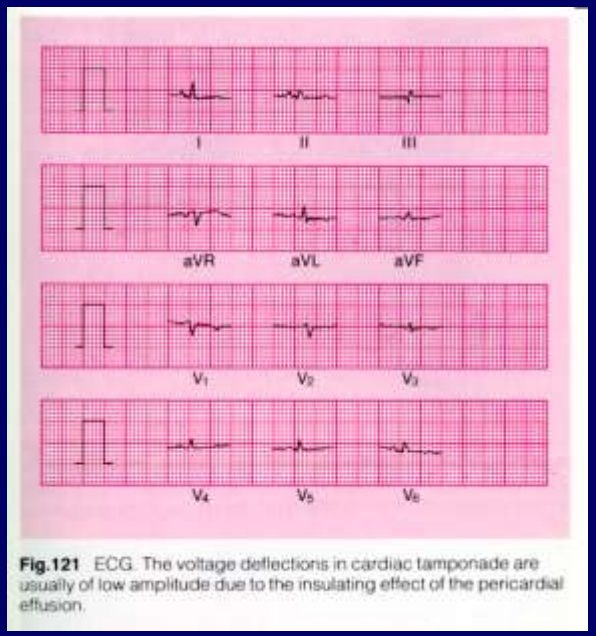


Fig.121 ECG. The voltage deflections in cardiac tamponade are usually of low amplitude due to the insulating effect of the pericardial effusion.

Podrazumeva kompresiju srca povećanim intraperikardnim pritiskom, koji ometa punjenje srca tokom dijastole

Signs and Symptoms
Pericardial Effusion and Tamponade

Symptoms	Signs
Dyspnea	Elevated neck veins
Fatigue	Absent "y" descent
Syncope	Tachycardia
Confusion	Hypotension
Chest Pain	Pulsus paradox
Shock	Friction rub
Peripheral	Quiet precordium
Edema	Peripheral edema
Abdominal Pain	Hepatomegaly

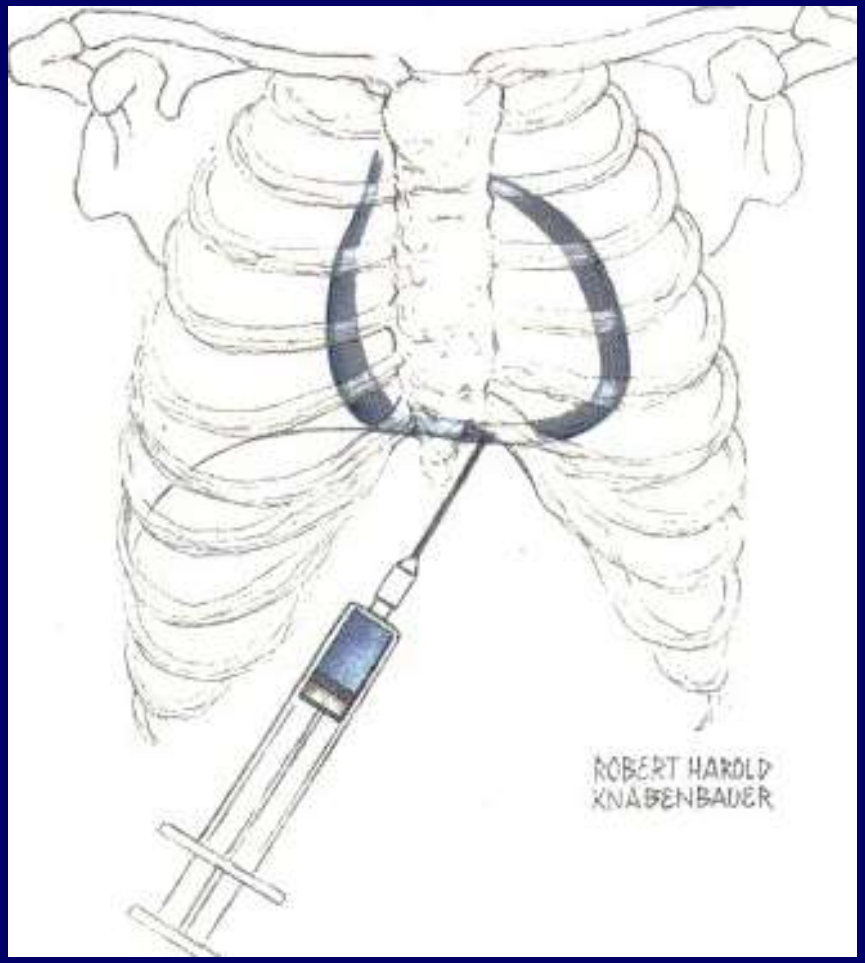
Beck's Triad

Detection of a Pulsus: The gap between when sounds are heard only in expiration versus when they are heard continuously

Tamponada srca

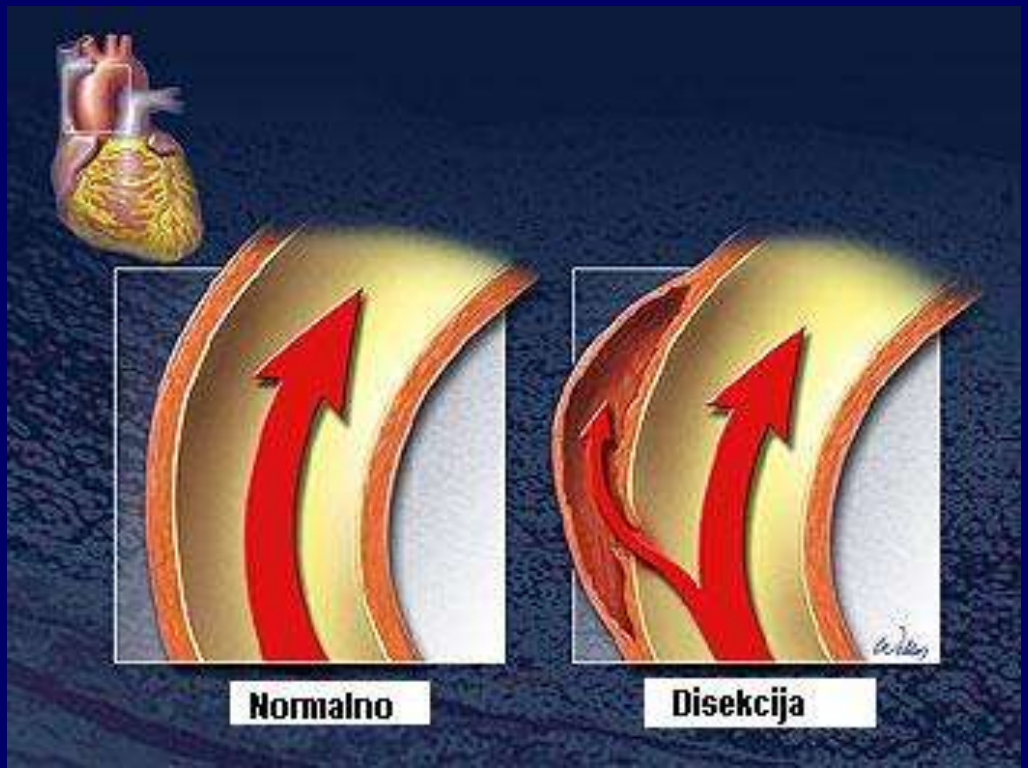
Terapija (smanjiti perikardni pritisak)

1. **perkutana perikardiocenteza;**
2. **perikardiotomija preko subksifoidne incizije s drenažom;**
3. **hirurška perikardiektomija i**
4. **perkutana balon perikardiotomija**



DISEKCIJA AORTE

Disekcija aorte je raslojavanje aortnog zida koje nastaje prodorom krvi u mediju, stvaranjem lažnog lumena koji se,usled pulsirajućeg krvotoka, širi anterogradno, a redje i retrogradno, različitom dužinom i obimom krvnog suda, najčešće komunicirajući sa pravim lumenom preko rascepa intime



Aortic dissection - common presenting symptoms

European Heart Journal (2001)

- Pain
- Syncope
- Pain with signs of congestive heart failure
- Pain with cerebrovascular accident (stroke)
- Congestive heart failure without pain
- Cerebrovascular accident without pain
- Pulse loss without pain
- Shock
- SCD

DISEKCIJA AORTE - OBJEKTIVNI NALAZ

- Hladna i vlažna koža
- Hipertenzija 80-90%
- Hipotenzija 38%
- Pulsni deficit P 50 D 15%
- Novonastali šum AR P 50%
- Neurološke manifestacije 6-19%
  * CVI- 3-6%
  * Koma, paarpareza ili paraplegija
- AIM 1-2%
- Promuklost i paraliza glasnih žica
- Hemoptizije ili hematemeza
- Sindrom gornje šuplje vene

•Dispneja
•Disfagija
•Hornerov sindrom
•Simptomi plućne embolije
•Znaci ishemije mezenteriljalne arterije 3-8%
•Oligirija i anurija 5-8%
•Lericheov Sy – 12%
•Perikardno trenje
•Pleuralni izliv

Aortic dissection - differential diagnosis

European Heart Journal (2001)

- Acute coronary syndrome with and without ST-elevation
- Aortic regurgitation without dissection
- Aortic aneurysms without dissection
- Musculoskeletal pain
- Pericarditis
- Mediastinal tumours
- Pleuritis
- Pulmonary embolism
- Cholecystitis
- Atherosclerotic or cholesterol embolism

Initial management of patients with suspected aortic dissection

European Heart Journal (2001)

Recommendation	Class I	II	III	Level of evidence
1. Detailed medical history and complete physical examination (whenever possible)	•			C
2. Intravenous line, blood sample (CK, TnT(I), myoglobin, WBC, D-dimer, haematocrit, LDH)	•			C
3. ECG: documentation of ischaemia	•			C
4. HR and blood pressure monitoring	•			C
5. Pain relief (morphine sulphate)	•			C
6. Reduction of systolic blood pressure using beta-blockers (i.v. propranolol, metoprolol, esmolol or labetalol)	•			C
7. Transfer to intensive care unit	•			C
8. In patients with severe hypertension additional vasodilator (i.v. sodium nitroprusside to titrate BP to 100–120 mmHg)	•			C
9. In patients with obstructive pulmonary disease, blood pressure lowering with calcium channel blockers		•		C
10. Imaging in patients with ECG signs of ischaemia before thrombolysis if aortic pathology is suspected		•		C
11. Chest X-ray			•	C

Diagnostic imaging in acute aortic dissection

European Heart Journal (2001)

Recommendation

1. Transthoracic echocardiography followed by transoesophageal echocardiography
2. Computed tomography
   - if detection of tears is crucial
3. Contrast angiography
   - to define anatomy in visceral malperfusion and to guide percutaneous interventions
   - in stable patients
   - routine preoperative coronary angiography
   - in haemodynamically unstable patients
4. Magnetic resonance imaging
   - in haemodynamically unstable patients
5. Intravascular ultrasound
   - to guide percutaneous interventions

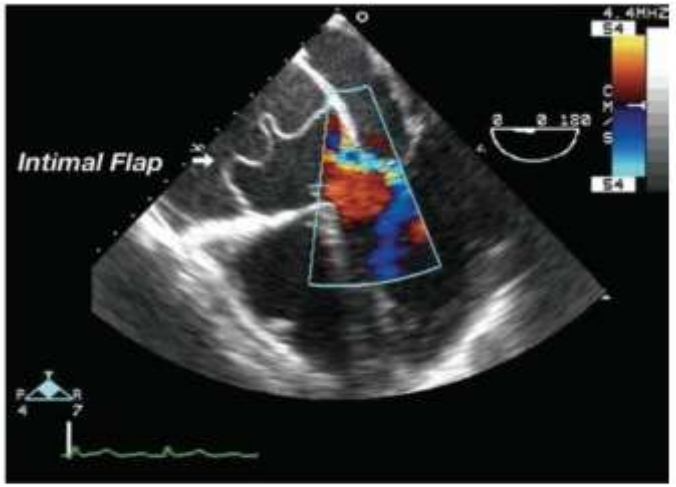
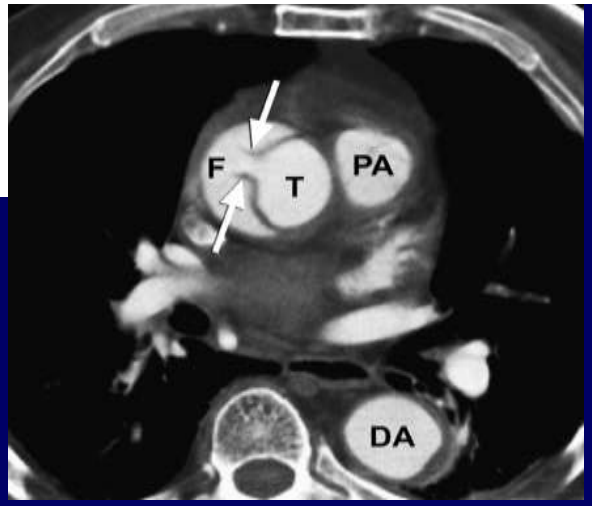


FIGURE 3: Transesophageal echocardiography mid-esophageal four-chamber view (zooming on the aortic valve), showing acute aortic dissection with an intimal flap (arrow). Color Doppler shows severe aortic regurgitation.



Classification of syncope

Reflex (neurally-mediated) syncope

Vasovagal:
- Mediated by emotional distress: fear, pain, instrumentation, blood phobia.
- Mediated by orthostatic stress.

Situational:
- Cough, sneeze.
- Gastrointestinal stimulation (swallow, defaecation, visceral pain).
- Micturition (post-micturition).
- Post-exercice.
- Post-prandial.
- Others (e.g., laught, brass instrument playing, weightlifting).

Carotid sinus syncope

Atypical forms (without apparent triggers and/or atypical presentation).

Syncope due to orthostatic hypotension

Primary autonomic failure:
- Pure autonomic failure, multiple system atrophy, Parkinson's disease with autonomic failure, Lewy body dementia.

Secondary autonomic failure:
- Diabetes, amyloidosis, uraemia, spinal cord injuries.

Drug-induced orthostatic hypotension:
- Alcohol, vasodilators, diuretics, phenotiazines, antidepressants.

Volume depletion:
- Haemorrhage, diarrhoea, vomiting, etc.

Cardiac syncope (cardiovascular)

Arrhythmia as primary cause:

Bradycardia:
- Sinus node disfunction (including brady-cardia/ tachycardia syndrome).
- Atrioventricular conduction system disease.
- Implanted device malfunction.

Tachycardia:
- Supraventricular.
- Ventricular (idiopathic, secondary to structural heart disease or to channelopathies).

Drug induced bradycardia and tachyarrhythmias

Structural disease:

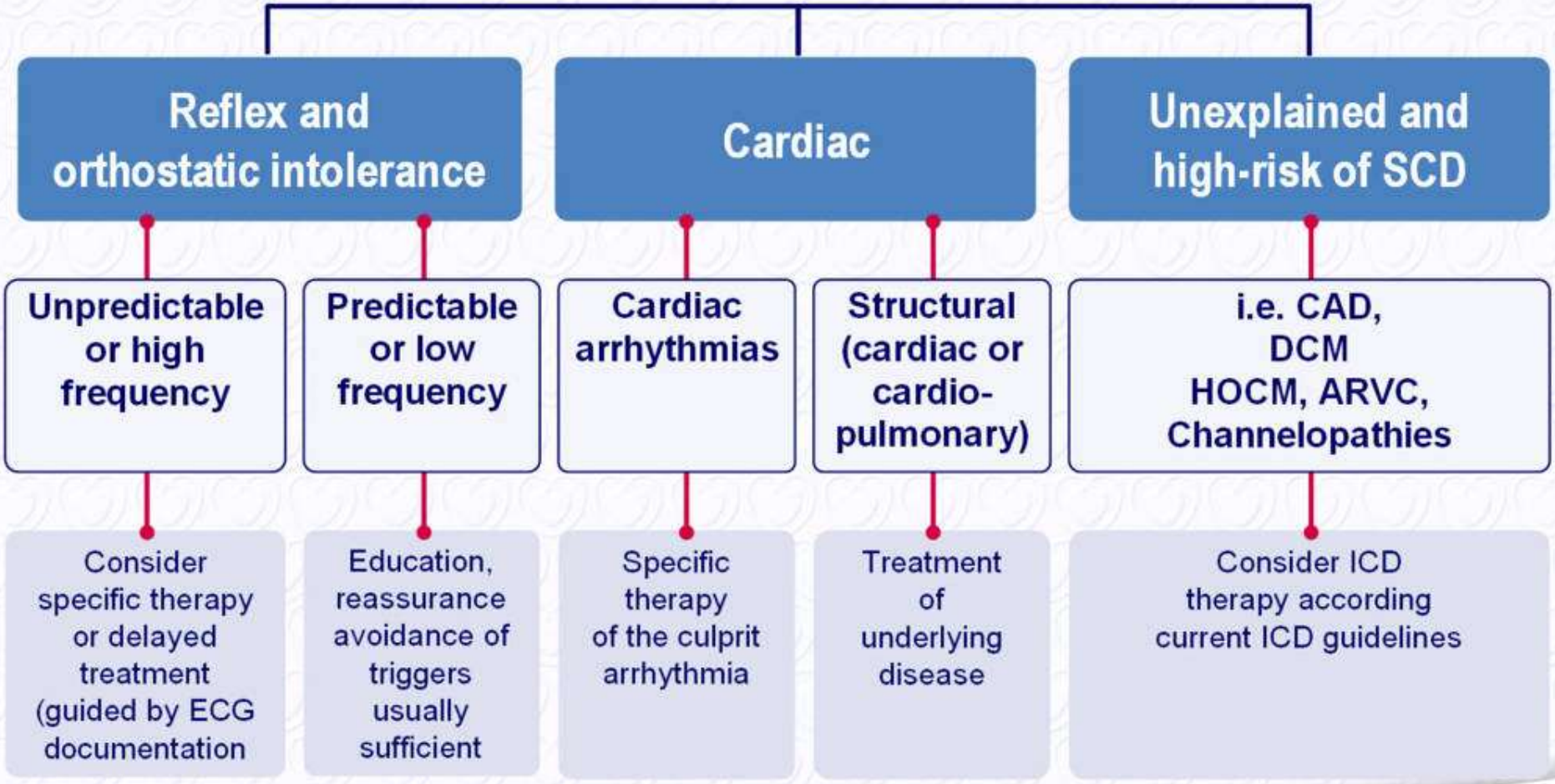
Cardiac: *cardiac valvular disease, acute myocardial infarction/ischaemia, hypertrophic cardiomyopathy, cardiac masses (atrial myxoma, tumors, etc), pericardial disease/tamponade, congenital anomalies of coronary arteries, prosthetic valves dysfunction.*

Others: *pulmonary embolus, acute aortic dissection, pulmonary hypertension.*

European Heart Journal 2009;30:2631-2671

Treatment of syncope

Diagnostic evaluation



European Heart Journal 2009;30:2631-2671

Cardiac arrhythmias

Nonpharmacological treatment

- Maneuvers
- Pacing
- Cardioversion
- AICD
- RF ablation

Pharmacological treatment

- Antiarrhythmic drugs

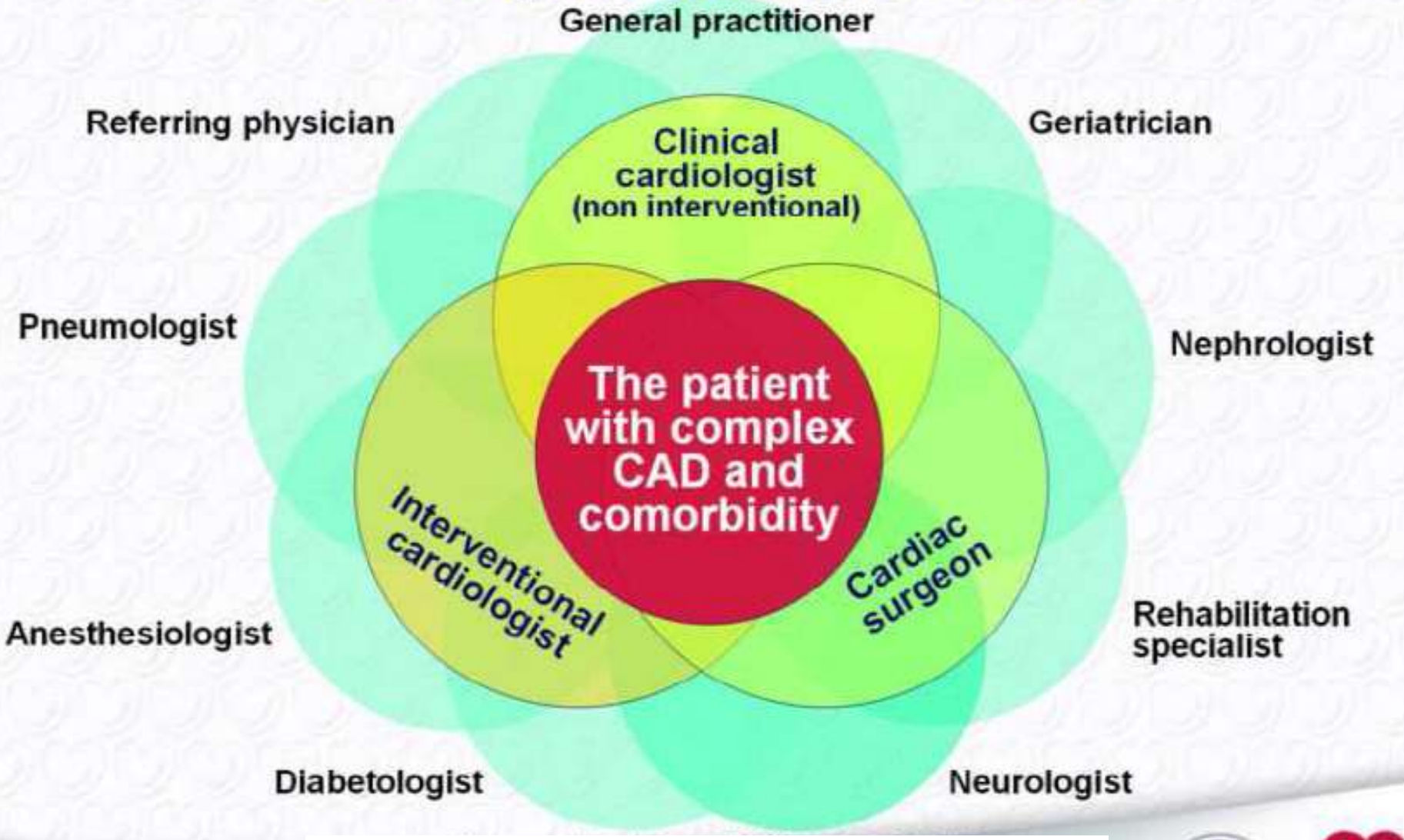
HITNA STANJA U KARDIOLOGIJI
KAKO POBOLJŠATI LEČENJE

- Edukacija, implementacija vodiča dobre kliničke prakse
- Tehnologija
- Organizacija
- Uvođenje novih terapijskih principa
- Internacionalna saradnja
- Proširen “tim za srce”
- Edukacija stanovništva
- Postavljanje automatskih spoljašnjih defibrilatora na javnim mestima


WARNING


AED
HEART SAFE BOX
DEFIBRILLATOR
122 Hosenruck

The Expanded Heart Team



Ne medicinski kadar - stanovništvo