Differential diagnosis of dyspnea and chest pain

Part two: Chest pain

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Chest pain

Cardiac chest pain

Acute

- Acute coronary syndromes
- Acute aortic syndromes
- Myocarditis
- Pericarditis
- Pulmonary embolism
- Pleuritis

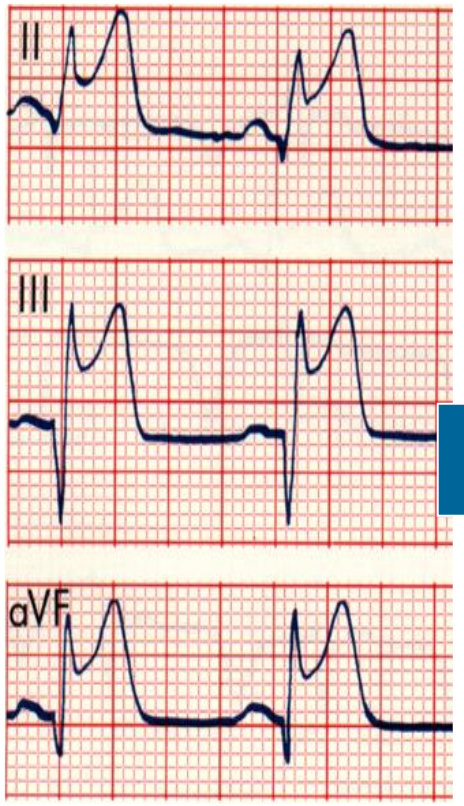
Chronic / recurrent

- Chronic coronary syndromes - angina
- Aortic stenosis
- Hypertrophic cardiomyopathy
- Aortic aneurysm
- Paricarditis

Acute coronary syndromes

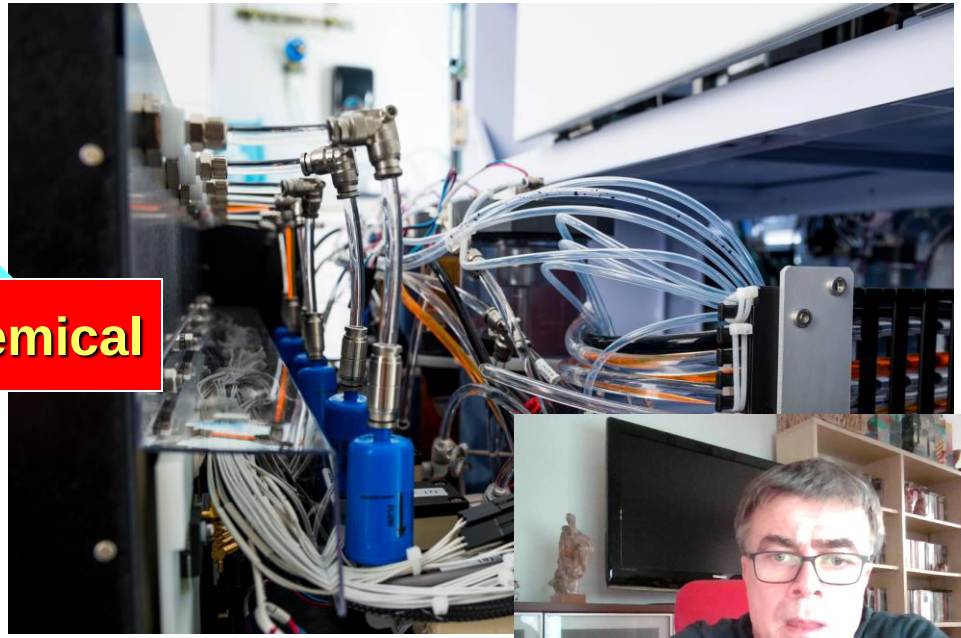
Clinical

Chest pain
Dyspnea
Palpitations
Vegetative signs



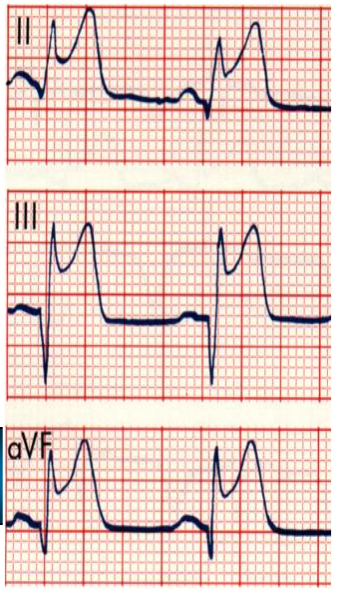
ECG

Biochemical



Hs- Troponin I / T
Myoglobin
CK-MB

ACS classification



Cute coronary syndromes

W/o ST elevations

With ST elevations

Negative markers

Biochemical markers positive

non STEMI

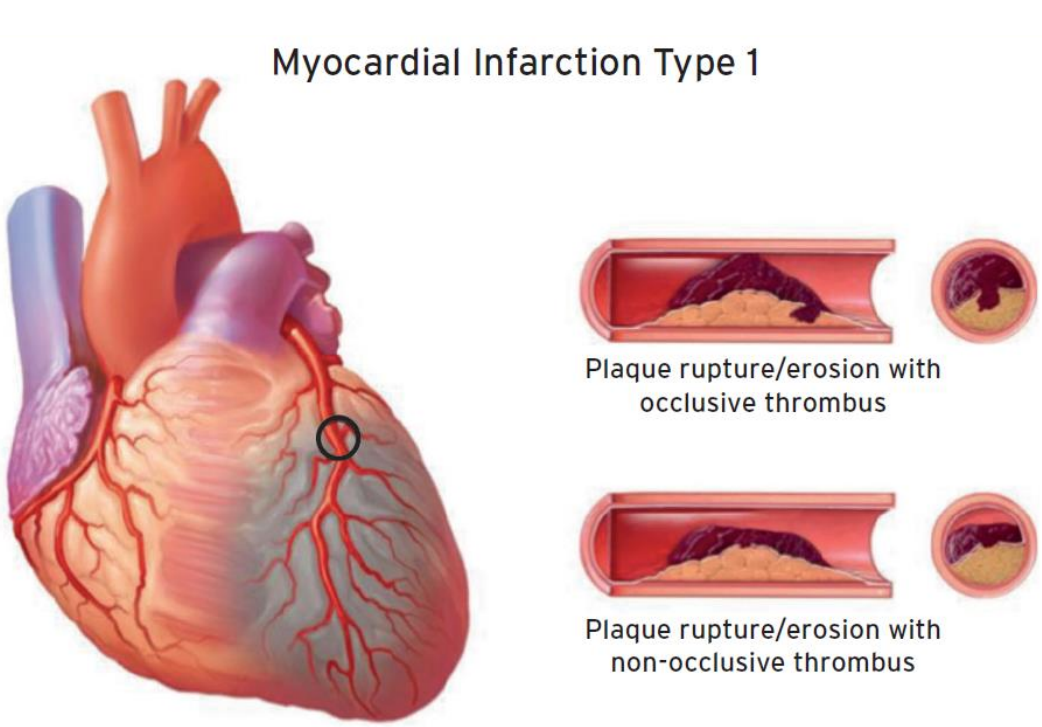
Unstable angina

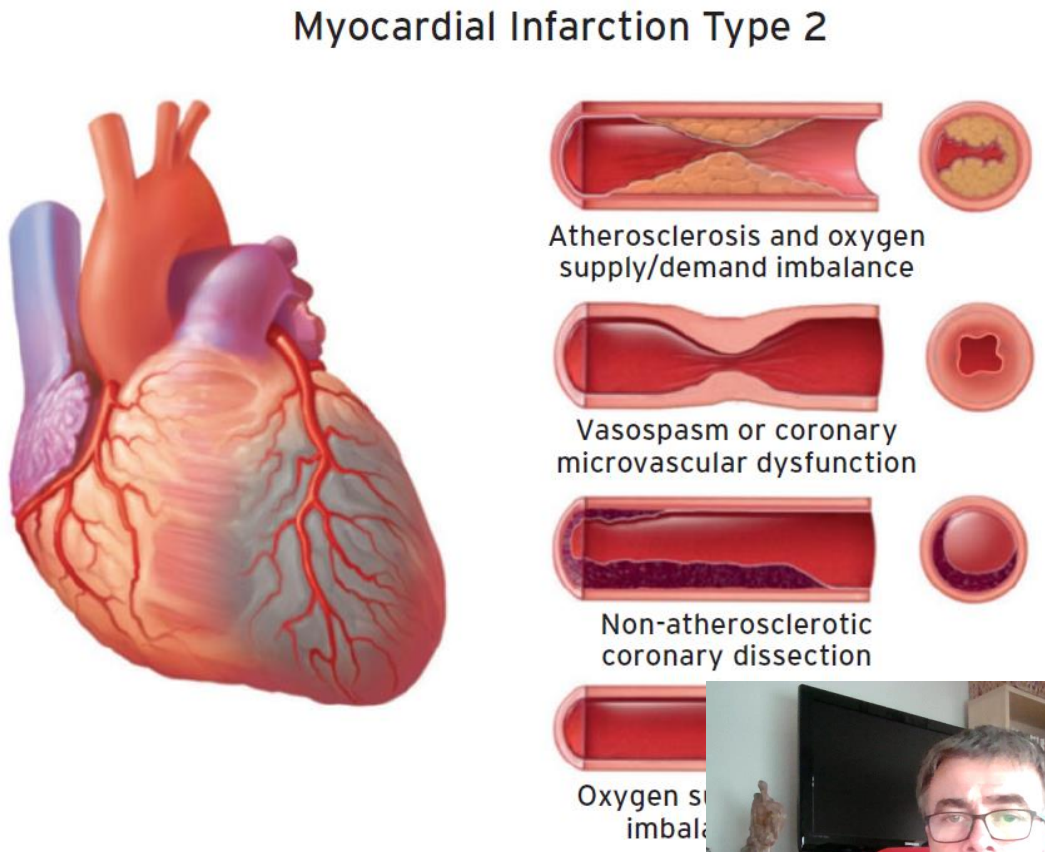
non Q IM

Q - IM

Eur Heart J 200

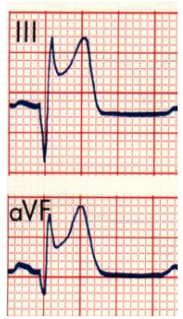
Types of myocardial infarction





Neumann FJ et al. European Heart Journal (2

Total ischemia time



PCI

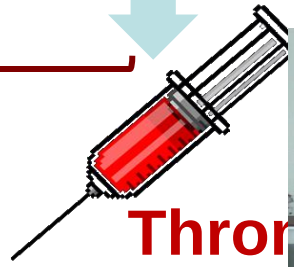
≤ 120 min

> 120 min

Caused by the patient

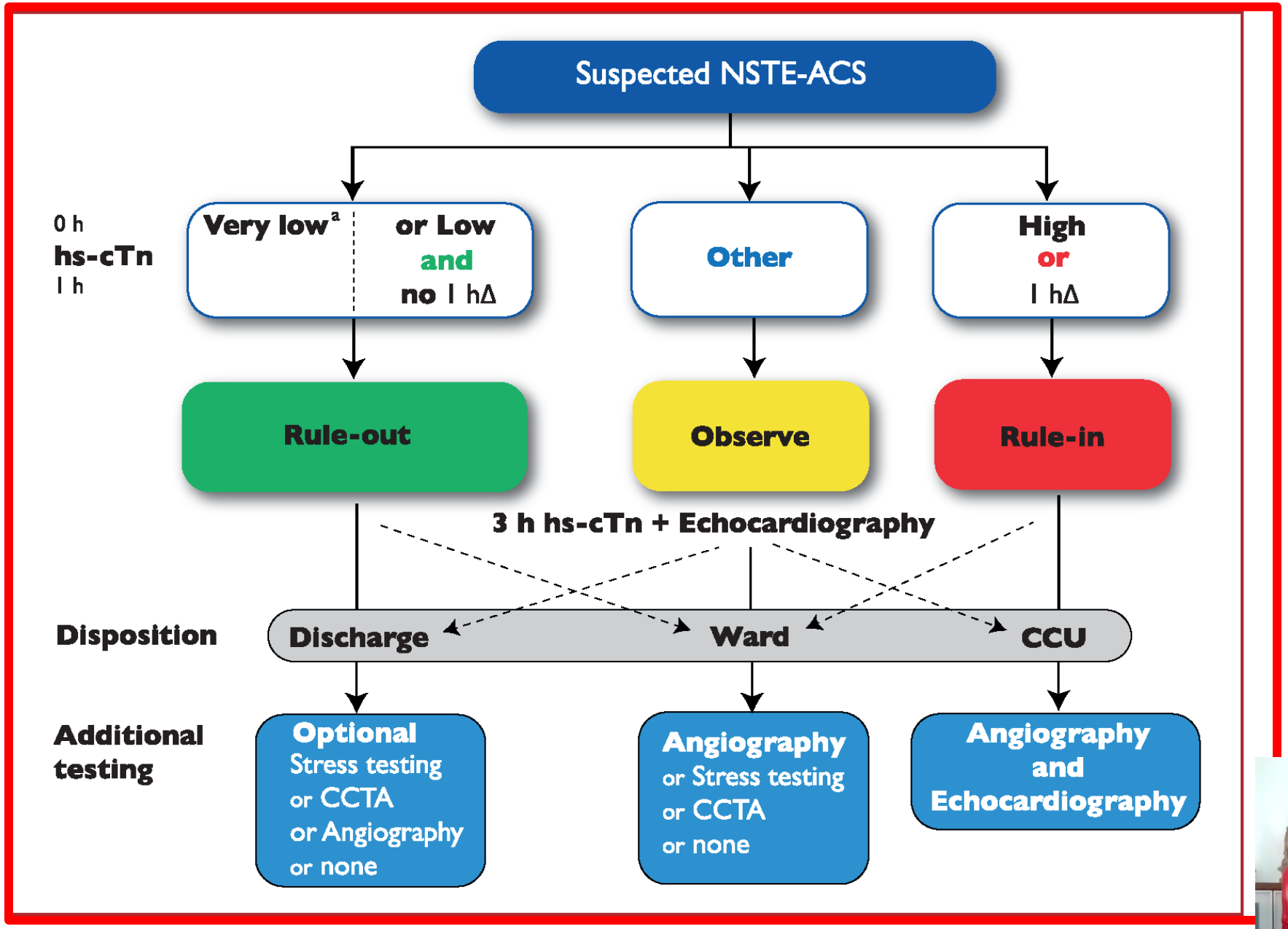
Caused by EMS transportation

Caused by healthcare system

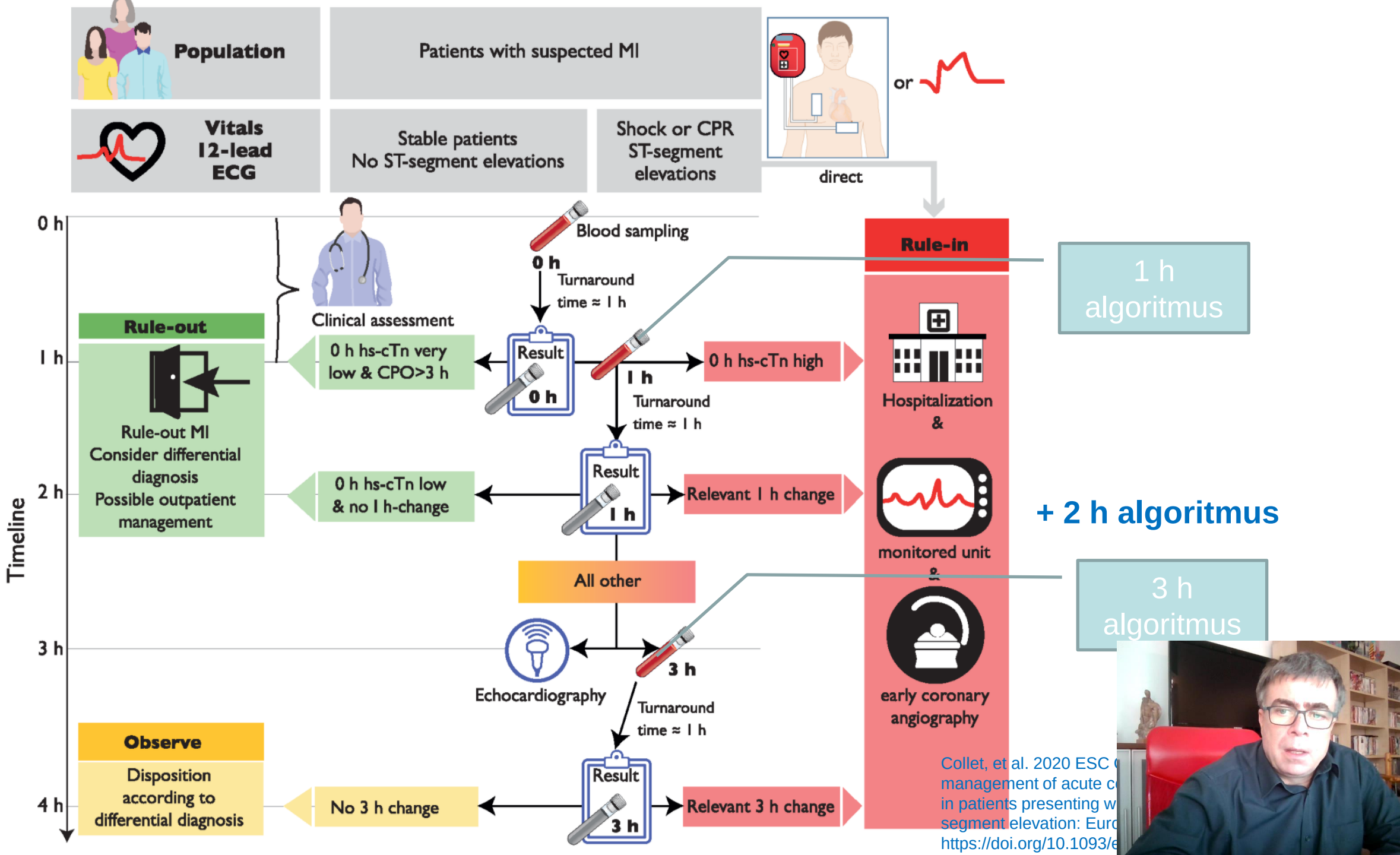


Thror

Modified fromP. Kala, et al., 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation: Summary of the document prepared by the Czech Society of Cardiology, Cor et Vasa 59 (2017) e613–e644,



Collet, et al. 2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevatio
Heart Journal, https://doi.org/10.1093/eurheartj/ehaa575



Collet, et al. 2020 ESC
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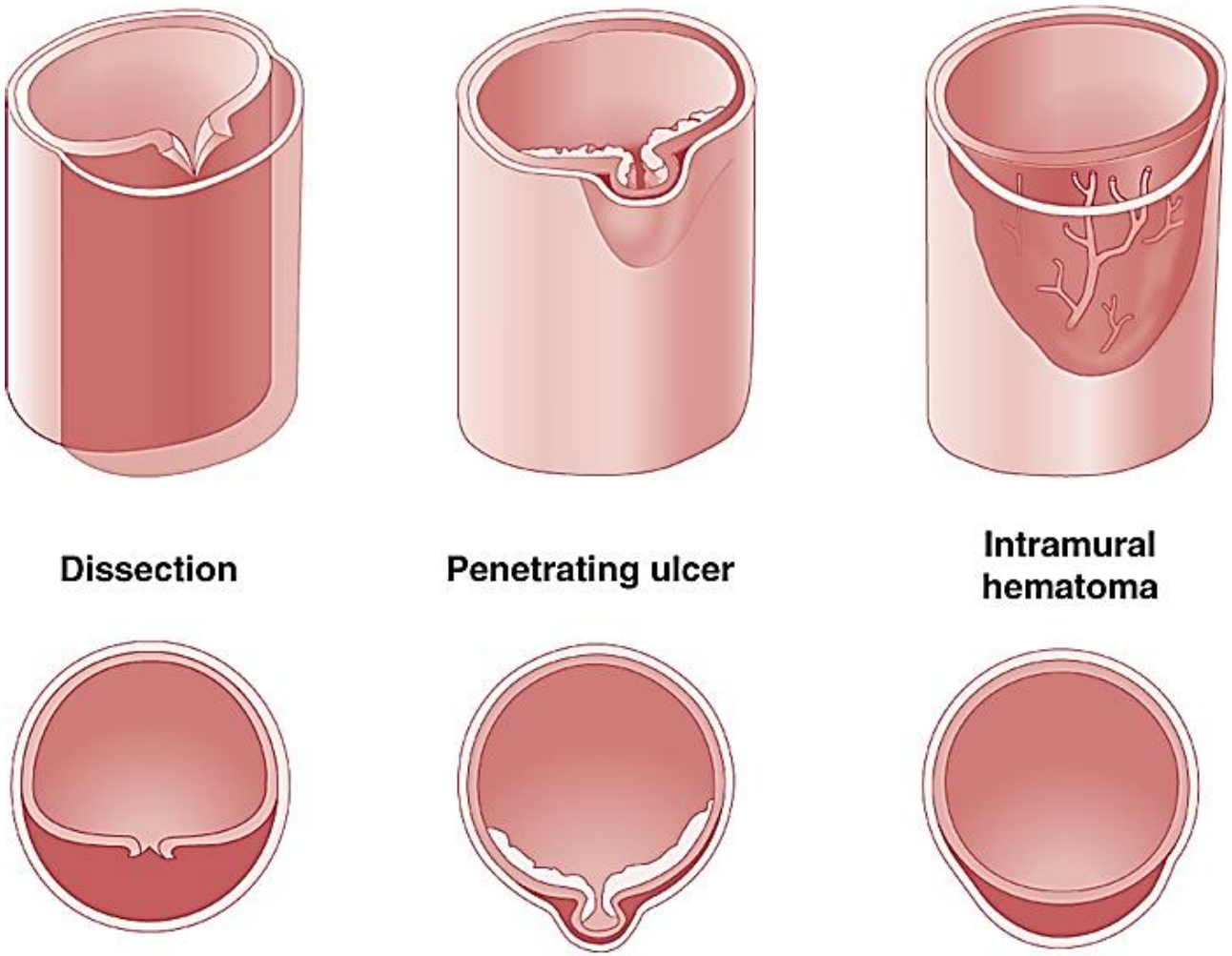
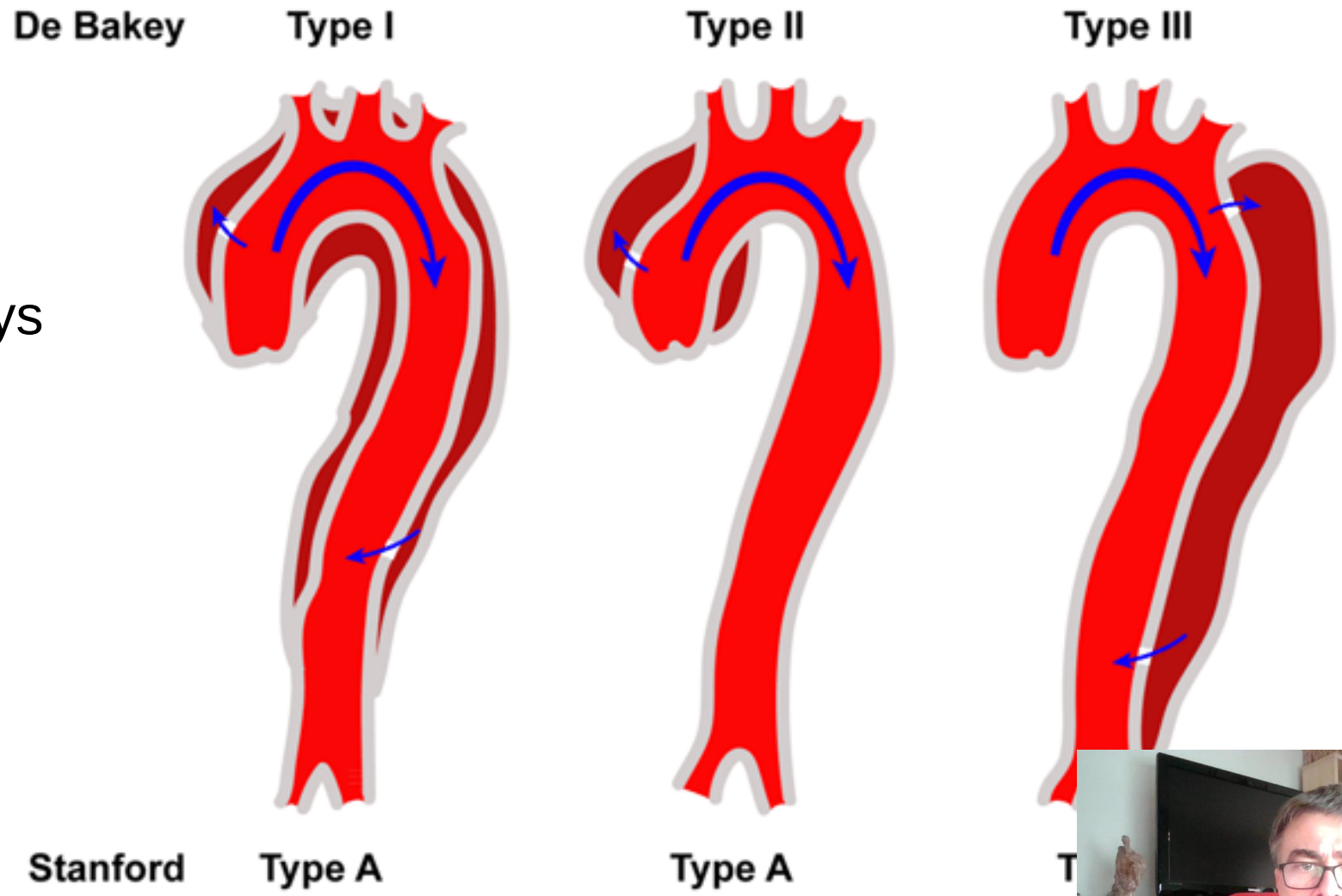
Acute aortic syndromes



Crawford MH: Current diagnosis and treatmen

Traditional classification of aortic dissection

- Acute < 14 days
- Subacute 15-90 days
- Chronic > 90 days



Jiang et al. American Journal of Translational Research (2016
Erbel et al. European Heart Journal (2014) 35:2873–2926

Dissection	Penetrating ulcer	Intramural hematoma
~ 70 – 80%	2 - 7%	10 - 25%
A: 60%	A: 5%	A: 30%
B: 40%	B: 95%	B: 70%

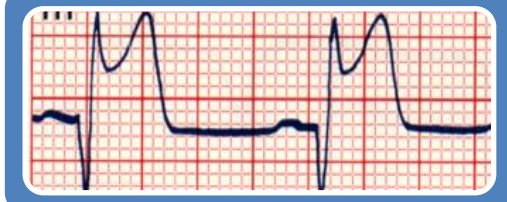
Crawford MH: Current diagnosis and treatment: Cardiology McGraw-Hill Educ
Massip Rev Esp Cardiol. 2004;57:66

Diagnostic methods in diseases of the aorta

- Risk factors
  - History
  - Genetic syndromes and gene sequencing
- Imaging methods
  - Chest X-ray
  - Echocardiography – TTE a TEE
  - CT angiography
  - Angiography
  - MRI
  - IVUS
  - PET - CT
- Biochemic markers (D-dimers, CRP, sELAF, calponin, smMHC)

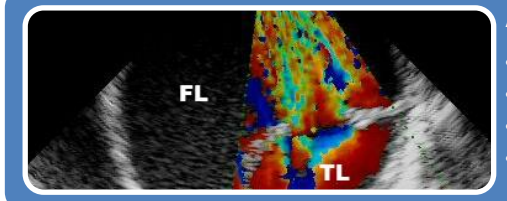
J Am Coll Cardiol 2010;56:1

Differential diagnosis of acute chest pain



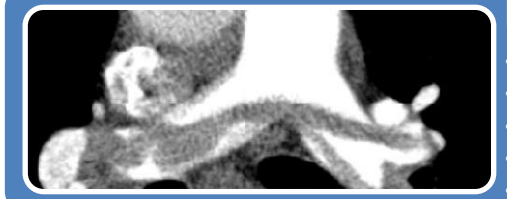
Acute coronary syndromes

- ECG – seek ST elevations or deep depression in precordial leads – STEMI = no need to wait for troponin results
- Troponin – use HS-TnI or HS-TnT – check the level and dynamic changes – progressive elevation after 1,2 or 3 hours
- Coronary angiography (invasive or CT) – CT scan only if in doubts and in low-risk patients, if suspicion is high, use invasive approach



Aortic dissection

- Echocardiography – Transoesophageal more useful, seek for intimal flap
- CT angiography – very useful
- MRI – takes time, less available
- D-dimers – may be elevated similar to pulmonary embolism cases – absence does not exclude acute aortic syndrome

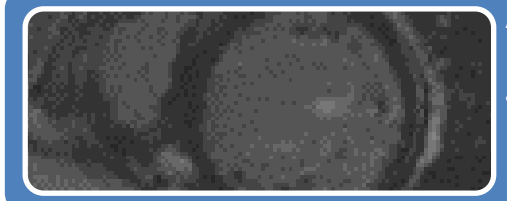


Pulmonary embolism

- ECG – not very specific
- Echocardiography – seek right ventricular overload (dilatation, dysfunction) and signs of pulmonary hypertension
- CT angiography – method of choice, be sure that the patient is stable enough to go through the scan,
- Ventilation / perfusion scan – useful but takes more time than CT, not widely available, use rather for CTEPH diagnosis
- D-dimers – low levels – low probability of PE, do not use to confirm the diagnosis

Pericarditis

- ECG – not very specific (PR depressions, repolarization changes)
- Lab. Markers of inflammation (CRP, procalcitonin, WBC)
- Echocardiography (seeks pericardial effusion, pericarditis may be present even in absence of any effusion)
- Exclude acute coronary syndromes (try not to label even young patients as pericarditis before being sure ACS is excluded)
- MRI or PET-CT may be helpful



Acute myocarditis

- Exclude acute coronary syndrome – troponins may be positive – usually with moderate dynamic changes!!! Use imaging.
- ECG, Echocardiography – non specific changes
- Lab. Markers of inflammation
- MRI – most useful method for myocarditis diagnosis – seek edema, accumulation of gadolinium (LGE – late gadolinium enhanc
- Endomyocardial biopsy