

PLACE



PLATFORM OF LABORATORIES FOR ADVANCES IN CARDIAC EXPERIENCE

ROMA

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di Confindustria

**Auditorium
della Tecnica**

9ª Edizione

30 Settembre

1 Ottobre

2022



TEN MINUTES ANSWERS IN CARDIOLOGIA D'URGENZA

**IL DOLORE TORACICO IN DEA: PERCORSI DIAGNOSTICI-
TERAPEUTICI. DALLE LINEE GUIDA ALLA REAL LIFE**

Dott.ssa Gligorova Suzana



SALA D'ATTESA



- Sovraffollamento in PS
- Spese inutili per la sanità
- Morti evitabili

AHA/ACC CLINICAL PRACTICE GUIDELINE

2021 AHA/ACC/ASE/CHEST/SAEM/SCCT/SCMR Guideline for the Evaluation and Diagnosis of Chest Pain: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines

- dopo il trauma, il dolore toracico è la seconda causa di accesso in PS (>6,5 milioni visite negli USA)
- Tra tutti questi solo **5,1%** avranno SCA, **più del 50%** avranno una causa non cardiaca

Il percorso del paziente con dolore toracico, G. Di Tano, R Bonatti;
G Ital Cardiol 2019.

- **25-50%** dei pazienti con dolore toracico acuto: ricovero inappropriato (spese inutili), **dimissioni inappropriate 2-8%** (mortalità per mancata diagnosi 2-4%)
- L'erronea dimissione dei pazienti con sindrome coronarica acuta (SCA) rappresenta **il 20% delle spese medico-legali** contro i medici del dipartimento d'emergenza negli Stati Uniti



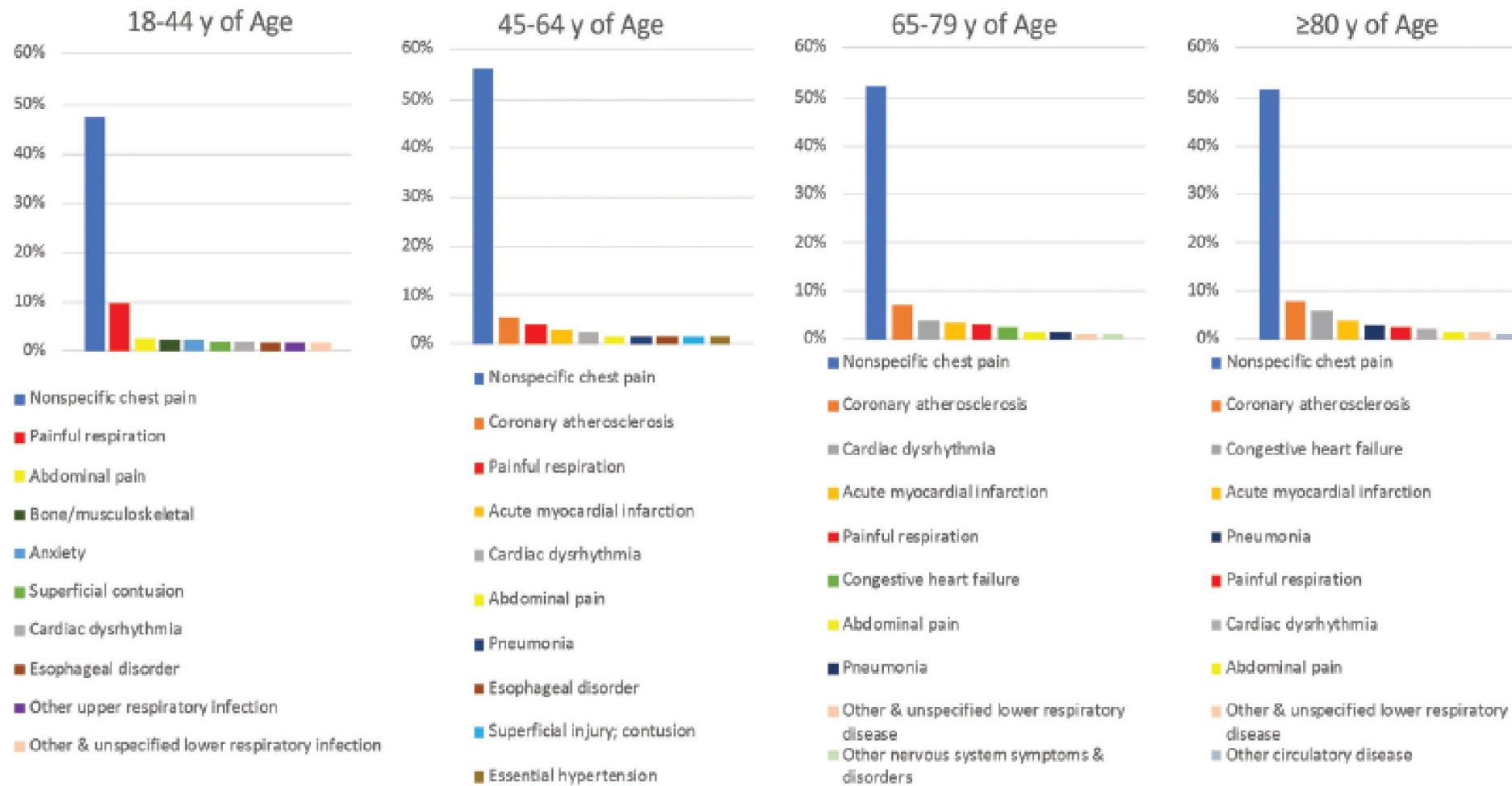


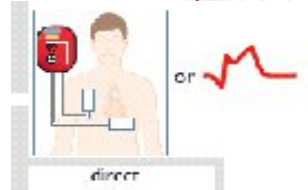
Figure 3. Top 10 Causes of Chest Pain in the ED Based on Age (Weighted Percentage)

1

Patient With Acute Chest Pain

- Anamnesi
- Caratteristiche del dolore
- Esame obiettivo

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Repeat ECG if symptoms persist or change or if troponins positive (1)

Leads V7-V9 are reasonable if posterior MI suspected (2a)

ECG (1)

Entro 10 min

Obvious noncardiac cause

No cardiac testing required (Section 4.3) (1)

Obvious nonischemic cardiac cause

Other cardiac testing as needed

Possible ACS

Obtain troponin (1)

Use CDP to risk stratify (1)

Low risk

No testing required (1)

Discharge

Intermediate risk

Further diagnostic testing may be indicated

?

High risk

Invasive coronary angiography (1)

SCA 5,1%

>50%

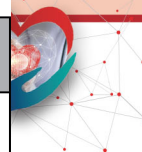
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Rule-in

Hospitalization & monitored unit & early coronary angiography

Table 6. Sample Clinical Decision Pathways Used to Define Risk

	<u>HEART Pathway</u> ³¹	EDACS ⁴⁴	ADAPT (mADAPT) ⁴⁵	NOTR ³⁴	2020 ESC/hs-cTn** ^{46,47}	2016 ESC/GRACE ^{11,38}
Target population	Suspected ACS	Suspected ACS, CP >5 min, planned serial troponin	Suspected ACS, CP >5 min, planned observation	Suspected ACS, ECG, troponin ordered	Suspected ACS, stable	Suspected ACS, planned serial troponin
Target outcome	<u>↑ ED discharge</u> without increasing missed 30-d or 1-y MACE	↑ ED discharge rate without increasing missed 30-d MACE	↑ ED discharge rate without increasing missed 30-d MACE	↑ Low-risk classification without increasing missed 30-d MACE	Early detection of AMI; 30-d MACE	<u>Early detection of AMI</u>
Variables used	<u>History</u> <u>ECG</u> <u>Age</u> <u>Risk factors</u> <u>Troponin (0, 3 h)</u>	Age Sex Risk factors History Troponin (0, 2 h)	TIMI score 0-1 No ischemic ECG changes Troponin (0, 2 h)	Age Risk factors Previous AMI or CAD Troponin (0, 2 h)	History ECG hs-cTn (0, 1 or 2 h)	Age HR, SBP Serum Cr Cardiac arrest ECG Cardiac biomarker Killip class
Risk thresholds:						
Low risk	<u>HEART score <3</u> Neg 0, 3-h cTn Neg 0, 2-h hs-cTn	EDACS score <16 Neg 0, 2 h hs-cTn No ischemic ECG Δ	TIMI score 0 (or <1 for mADAPT) Neg 0, 2-h cTn or hs-cTn No ischemic ECG Δ	Age <50 y <3 risk factors Previous AMI or CAD Neg cTn or hs-cTn (0, 2 h)	Initial hs-cTn is "very low" and Sx onset >3 h ago Or Initial hs-cTn "low" and 1- or 2-h hs-cTn Δ is "low"	Chest pain free, GRACE <140 Sx <6 h - hs-cTn <ULN (0, 3 h) Sx >6 h - hs-cTn <ULN (arrival)
Intermediate risk	HEART score 4-6	NA	TIMI score 2-4	NA	Initial hs-cTn is between "low" and "high" And/Or 1- or 2-h hs-cTn Δ is between low and high thresholds	T0 hs-cTn = 12-52 ng/L or 1-h Δ = 3-5 ng/L
High risk	<u>HEART score 7-10</u> ^{48,49}	NA	TIMI score 5-7 ⁴⁹	NA	Initial hs-cTn is "high" Or 1- or 2-h hs-cTn Δ is high	T0 hs-cTn >52 ng/L Or Δ 1 h >5 ng/L



HEART score <3
Neg 0, 3-h cTn
Neg 0, 2-h hs-cTn

HEART score 7-10^{48,49}

T0 hs-cTn >52 ng/L
Or
 Δ 1 h >5 ng/L

↓
Sovraccollamento
in PS

↓
Spese inutili
Morti evitabili

↓
Morti evitabili

Figure 3 (1)

0 h/1 h rule-out and rule-in algorithm using high-sensitivity cardiac troponin assays in haemodynamically stable patients presenting with suspected non-ST-segment elevation acute coronary syndrome to the emergency department.



Levels of hs-cTn should be interpreted as quantitative markers of cardiomyocyte damage (i.e. the higher the level, the greater the likelihood of MI):

- Elevations beyond 5-fold the upper reference limit have high (>90%) PPV for acute type 1 MI.
- Elevations up to 3-fold the upper reference limit have only limited (50–60%) PPV for AMI and may be associated with a broad spectrum of conditions.
- It is common to detect circulating levels of cardiac troponin in healthy individuals.

Rising and/or falling cardiac troponin levels differentiate acute (as in MI) from chronic cardiomyocyte damage (the more pronounced the change, the higher the likelihood of AMI).

Table 2 Conditions other than acute type 1 myocardial infarction associated with cardiomyocyte injury (= cardiac troponin elevation) (1)

Tachyarrhythmias

Heart failure

Hypertensive emergencies

Critical illness (e.g. shock/ sepsis/ burns)

Myocarditis^a

Takotsubo syndrome

Valvular heart disease (e.g. aortic stenosis)

Aortic dissection

Pulmonary embolism, pulmonary hypertension

Renal dysfunction and associated cardiac disease

Acute neurological event (e.g. stroke or subarachnoid haemorrhage)

Cardiac contusion or cardiac procedures (CABG, PCI, ablation, pacing, cardioversion, or endomyocardial biopsy)

Hypo- and hyperthyroidism

Infiltrative diseases (e.g. amyloidosis, haemochromatosis, sarcoidosis, scleroderma)

Myocardial drug toxicity or poisoning (e.g. doxorubicin, 5-fluorouracil, herceptin, snake venoms)

Extreme endurance efforts

Rhabdomyolysis

3

HEART score 7-10^{48,49}

T0 hs-cTn >52 ng/L

Or

 Δ 1 h >5 ng/L

Risk Identification

Therapeutic strategy

Risk Category

Very high risk

- Haemodynamic instability
- Cardiogenic shock
- Recurrent/refractory chest pain despite medical treatment
- Life-threatening arrhythmias
- Mechanical complications of MI
- Acute heart failure clearly related to NSTEMI-ACS
- ST-segment depression >1 mm/6 leads plus ST-segment elevation aVr and/or V1

High risk

- Established NSTEMI diagnosis
- Dynamic new or presumably new contiguous ST/T-segment changes (symptomatic or silent)
- Resuscitated cardiac arrest without ST-segment elevation or cardiogenic shock
- GRACE risk score >140

Low risk

Lack of any of the very high or high risk characteristics

Symptom onset

First medical contact → NSTEMI-ACS diagnosis

PCI center

EMS or Non-PCI center

YES

YES

Very High

Very High

YES

High

High

Low

Immediate invasive (< 2 h)

Early Invasive (< 24 h)

Selective Invasive

Immediate transfer to PCI center

Same day transfer

YES

YES

YES

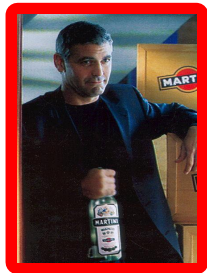
Intermediate risk	HEART score 4-6	TIMI score 2-4	Initial hs-cTn is between "low" and "high" And/Or 1- or 2-h hs-cTn Δ is between low and high thresholds	T0 hs-cTn = 12-52 ng/L or 1-h Δ = 3-5 ng/L
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Pretest likelihood of CAD	Low	→	No testing necessary	→	Option for CAC for ASCVD risk stratification
	Intermediate-high	→	Younger patient (<65 y of age)	OR	Less obstructive CAD suspected → <u>CCTA favored</u>
	Intermediate-high	→	Older patient (≥65 y of age)	OR	More obstructive CAD suspected → <u>Stress testing favored</u>

Table 6. Warranty Period for Prior Cardiac Testing

Test Modality	Result	Warranty Period
Anatomic	Normal coronary angiogram CCTA with no stenosis or plaque	2 y
Stress testing	Normal stress test (given adequate stress)	1 y

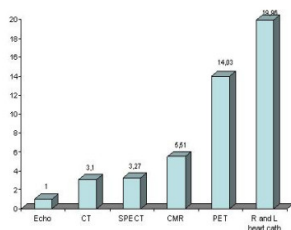
• Quale test scegliere



No good acoustic window.....
NO ecostress !



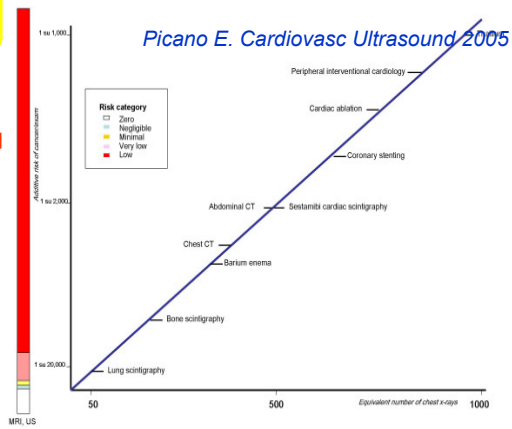
The average cost of cardiac imaging



Basso Costo "Economico"
Basso Costo
"Biologico"



ARCHIVES OF
INTERNAL MEDICINE



Stima della spesa inutile
in diagnostica x anno = 4
- 10 miliardi euro

Projected Cancer Risks From Computed
Tomographic Scans Performed
in the United States in 2007

Amy Berrington de Gonzalez et al.

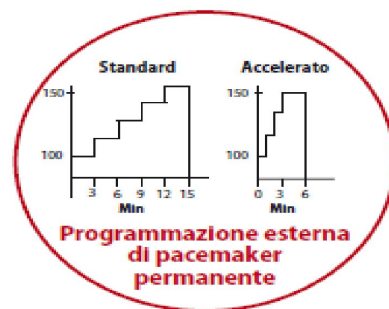
DEC 14, 2009

Overall, we estimated that approximately 29000 (95% UL, 15000-45000)
future cancers could be related to CT scans performed in the US in 2007
(2 % of all US cancers).



	Esercizio non fattibile	Asma	Tachiaritmie	Ipertensione severa	Finestra acustica difficile
EX	●	●	●	●	●
DIP	●	●	●	●	●
DOB	●	●	●	●	●

Fig. 5.1 A ciascuno il suo: il tipo di stress viene cucito su misura sulle caratteristiche del paziente, in base alle indicazioni e controindicazioni e al quesito clinico. (Da Picano E, *Stress echocardiography*, Sixth edition, Springer-Verlag, 2015, per gentile concessione)



Patient With Acute Chest Pain

- *Anamnesi*
- *Caratteristiche del dolore*
- *Esame obiettivo*

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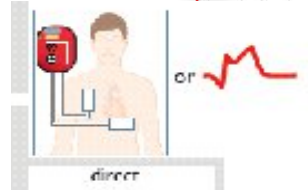
Repeat ECG if symptoms persist or change or if troponins positive (1)

Leads V7-V9 are reasonable if posterior MI suspected (2a)

ECG (1)

Entro 10 min

"Non solo il tempo ma anche l'organizzazione è muscolo".



Obvious noncardiac cause

No cardiac testing required (Section 4.3) (1)

Obvious nonischemic cardiac cause

Other cardiac testing as needed

Possible ACS

Obtain troponin (1)

Use CDP to risk stratify (1)

Low risk

No testing required (1)

Discharge

Intermediate risk

Further diagnostic testing may be indicated

High risk

Moderate-severe abnormality

SCA 5,1%

Rule-in

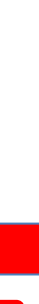
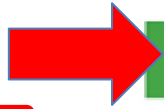
Hospitalization &

monitored unit &

early coronary angiography

>50%

[Red box]



Patient With Acute
Chest Pain

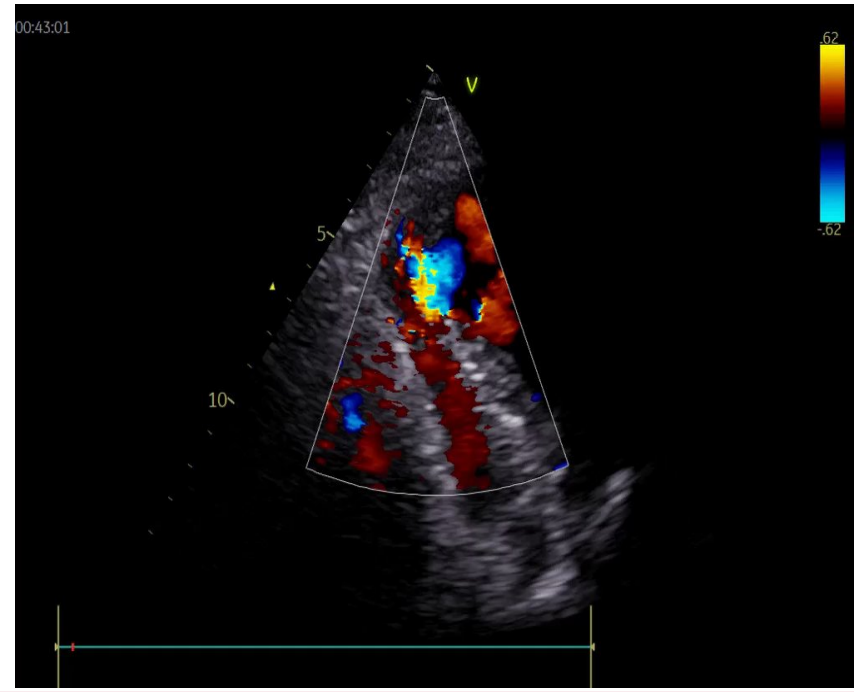
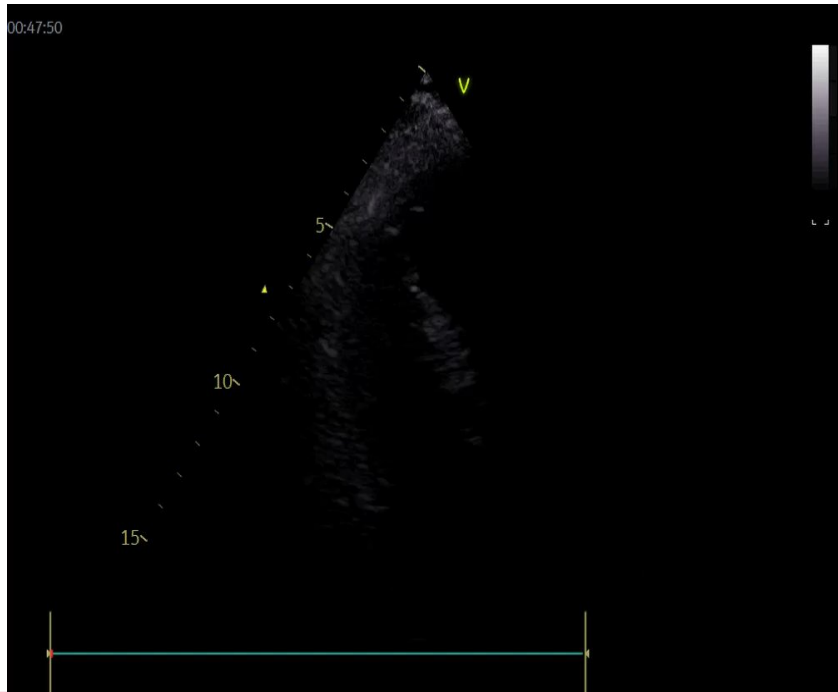
- *Anamnesi*
- *Caratteristiche del dolore*
- *Esame obiettivo*

ECG
(1)

Entro 10 min

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Case Reports

Patient With Acute
Chest Pain

- *Anamnesi*
- *Caratteristiche del dolore*
- *Esame obiettivo*

ECG

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2020 Sep;115(6):488-490.

Intracranial hemorrhage masquerading as STEMI

P Kreuzer ¹, G Hackl ¹, F Eisner ¹, A Reisinger ¹, G Schilcher ¹, P Eller ²

Abstract

A 56-year-old woman was found unconscious and promptly intubated. The electrocardiogram showed **ST elevations** in I, aVL, V1-V4. Thus, **lysis therapy** was performed. After admission to the intensive care unit, the patient was reassessed. Laboratory evaluation confirmed elevated troponin T. However, **coronary angiography showed no coronary artery disease**, whereas cerebral computed tomography revealed **massive intracranial hemorrhage** without neurosurgical treatment option. **Brain death was confirmed after 54 hours**. This case highlights electrocardiographic changes in intracranial hemorrhage that may be masquerading as STEMI.

Anomalie dell'ECG: QTc prolungato, anomalie del RV tipo STEMI oppure NSTEMI, onda U...

Patient With Acute
Chest Pain

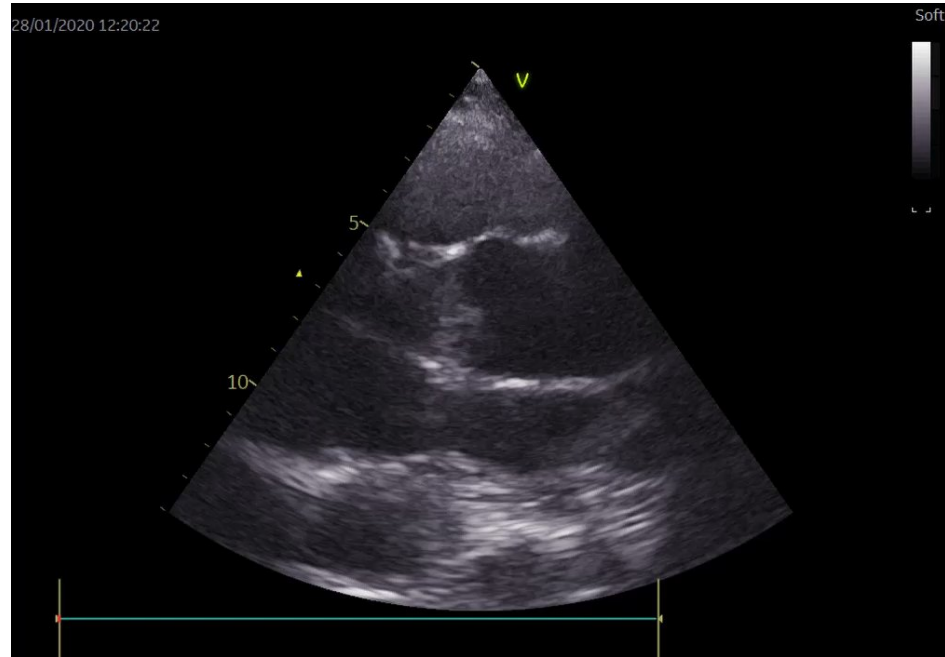
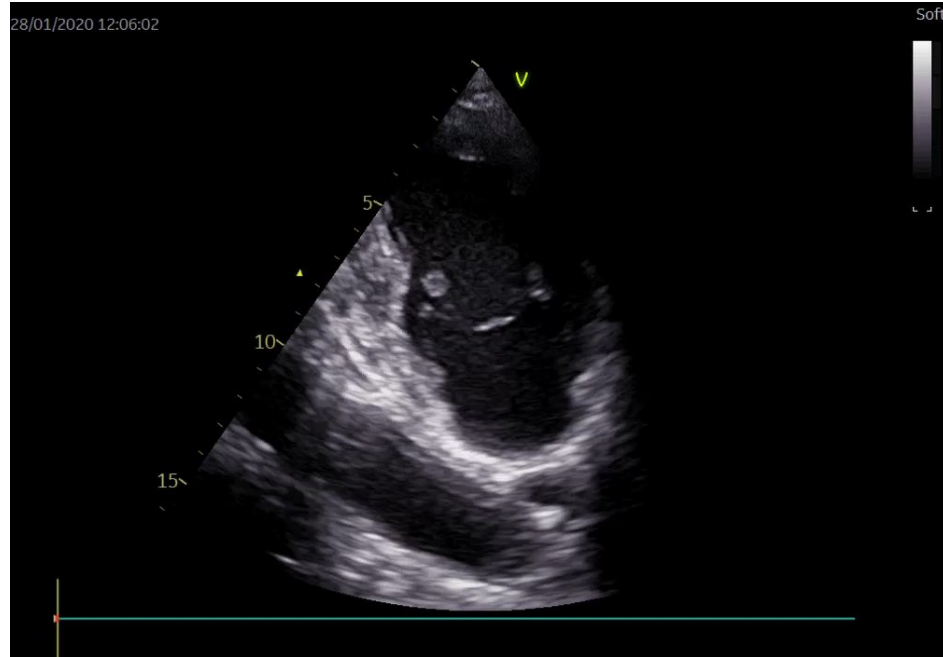
- Anamnesi
- Caratteristiche del dolore
- Esame obiettivo

ECG
(1)

Entro 10 min

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Patient With Acute
Chest Pain

- *Anamnesi*
- *Caratteristiche del dolore*
- *Esame obiettivo*

ECG
(1)

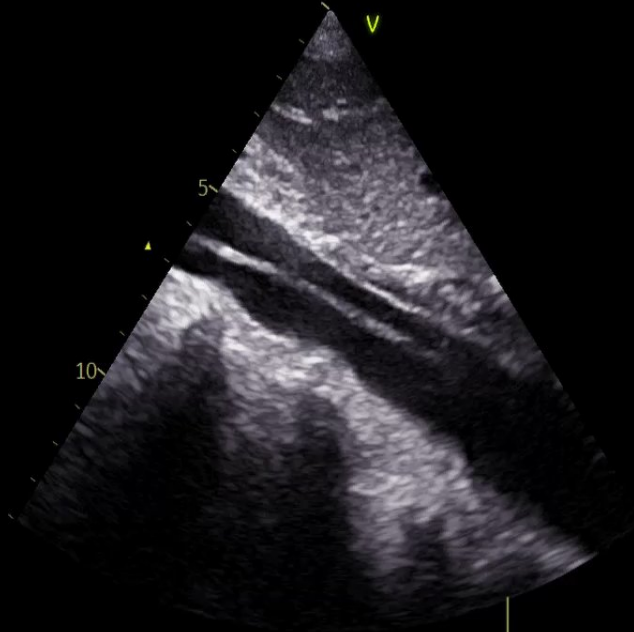
Entro 10 min

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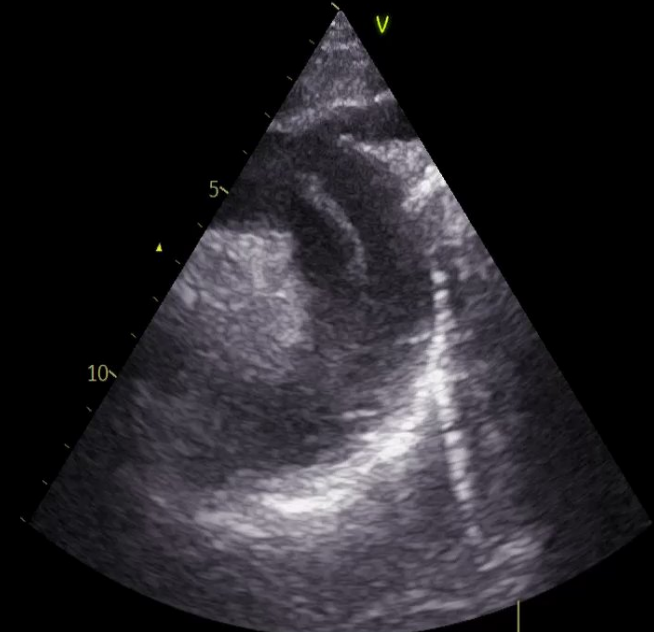
28/01/2020 12:14:33

Soft



28/01/2020 12:15:16

Soft



Aortic Dissection Detection Risk Score (ADD-RS) ☆

Rules out aortic dissection.

Any high risk condition

No 0	Yes +1
------	--------

Marfan syndrome, family history of aortic disease, known aortic valve disease, recent aortic manipulation, or known [TAA](#)

Any high risk pain feature

No 0	Yes +1
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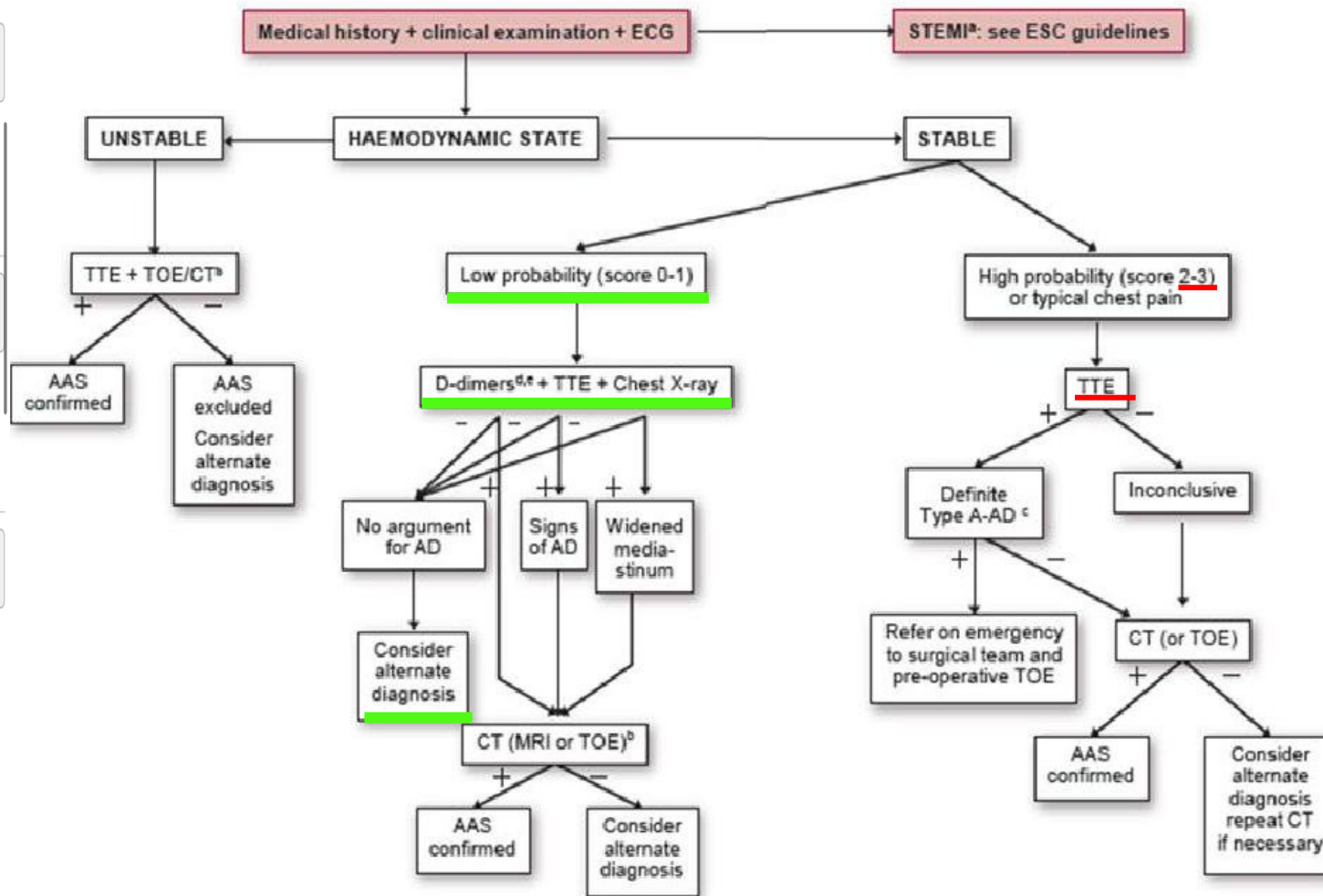
Chest, back, or abdominal pain described as abrupt onset, severe intensity, or ripping/tearing

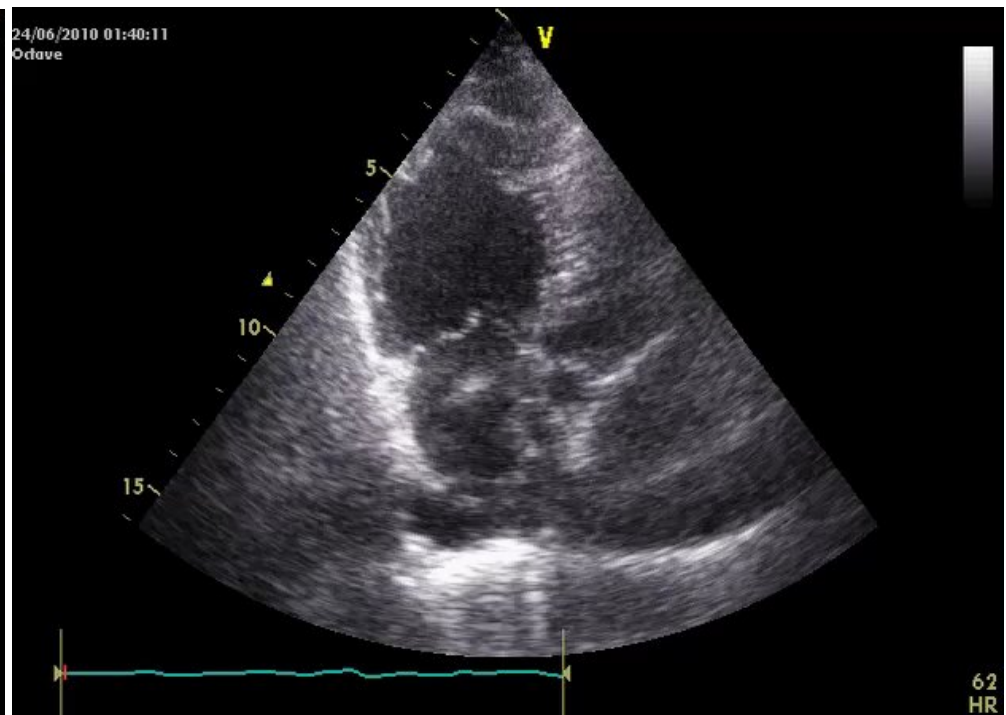
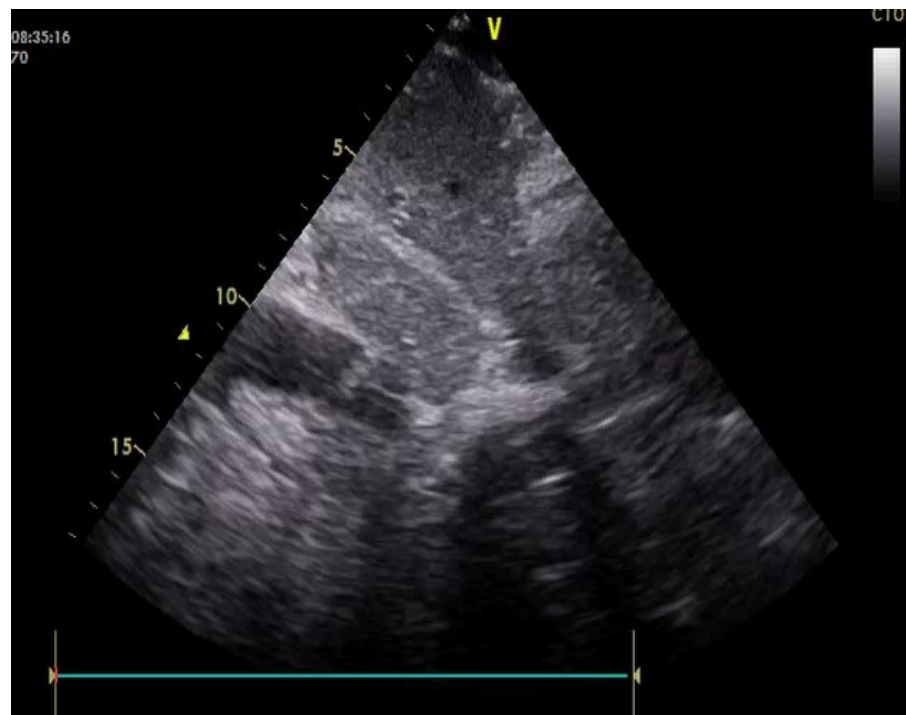
Any high risk exam feature

No 0	Yes +1
------	--------

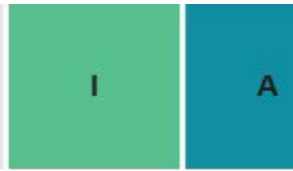
Evidence of perfusion deficit (pulse deficit, systolic BP differential, or focal neuro deficit plus pain), new aortic insufficiency murmur (with pain), hypotension/shock

ACUTE CHEST PAIN





Plasma D-dimer measurement, preferably using a highly sensitive assay, is recommended in outpatients/emergency department patients with low or intermediate clinical probability, or PE-unlikely, to reduce the need for unnecessary imaging and irradiation.

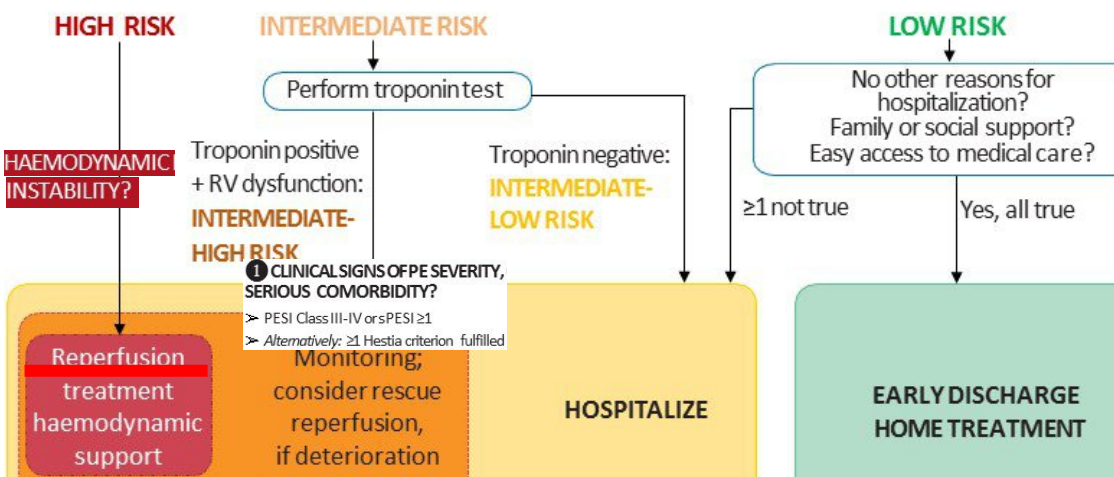


Revised Geneva clinical prediction rule for PE

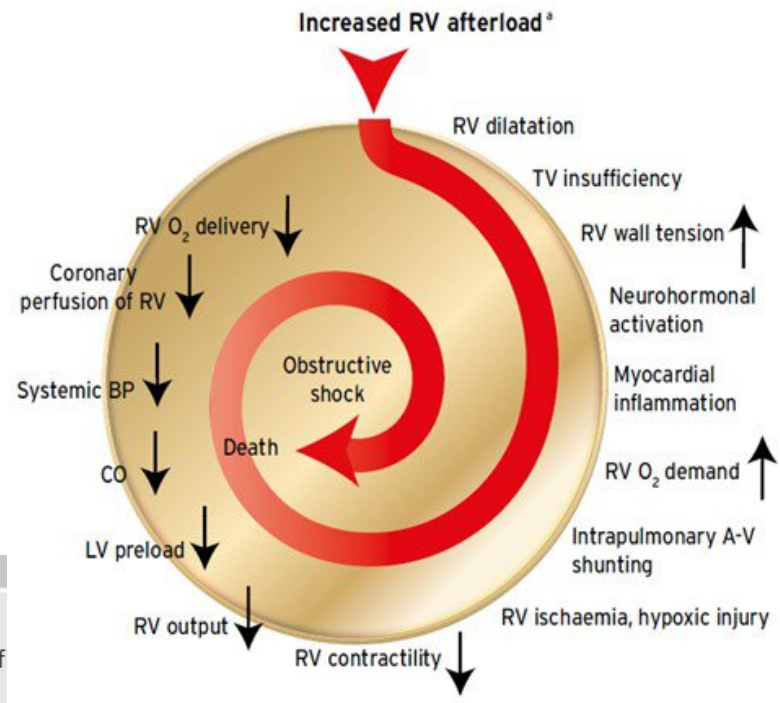
	Original version	Simplified ver.		Original version	Simplified version
Previous PE or DVT	3	1	Active cancer	2	1
Heart rate			Unilateral lower limb pain	3	1
75–94 b.p.m.	3	1	Pain on lower limb deep venous palpation and unilateral oedema	4	1
≥95 b.p.m.	5	2	Age >65 years	1	1
Surgery or fracture within the past month	2	1			
Haemoptysis	2	1			

Clinical probability		
Three-level score		
Low	0–3	0–1
Intermediate	4–10	2–4
High	≥11	≥5
Two-level score		
PE unlikely	0–5	0–2
PE likely	≥6	≥3

Recommendations	Class	Level
Suspected PE with haemodynamic instability		
In suspected high-risk PE, as indicated by the presence of haemodynamic instability, <u>bedside echocardiography</u> or emergency CTPA (depending on availability and clinical circumstances) are recommended for diagnosis.	I	C



Molecule	Regimen	Contraindications to fibrinolysis
Recombinant tissue-type plasminogen activator (rtPA)	100 mg over 2 h	Absolute <ul style="list-style-type: none"> • History of haemorrhagic stroke or stroke of unknown origin • Ischaemic stroke in previous 6 months • Central nervous system neoplasm • Major trauma, surgery, or head injury in previous 3 weeks • Bleeding diathesis • Active bleeding
	0.6 mg/kg over 15 min (maximum dose 50 mg)	
Streptokinase	250,000 IU as a loading dose over 30 min, followed by 100,000 IU/h over 12–24 h	
	Accelerated regimen: 1.5 million IU over 2 h	





ESC

European Society
of Cardiology

European Heart Journal (2021) 42, 3227–3337
doi:10.1093/eurheartj/ehab484

ESC GUIDELINES



2021 ESC Guidelines on cardiovascular disease prevention in clinical practice

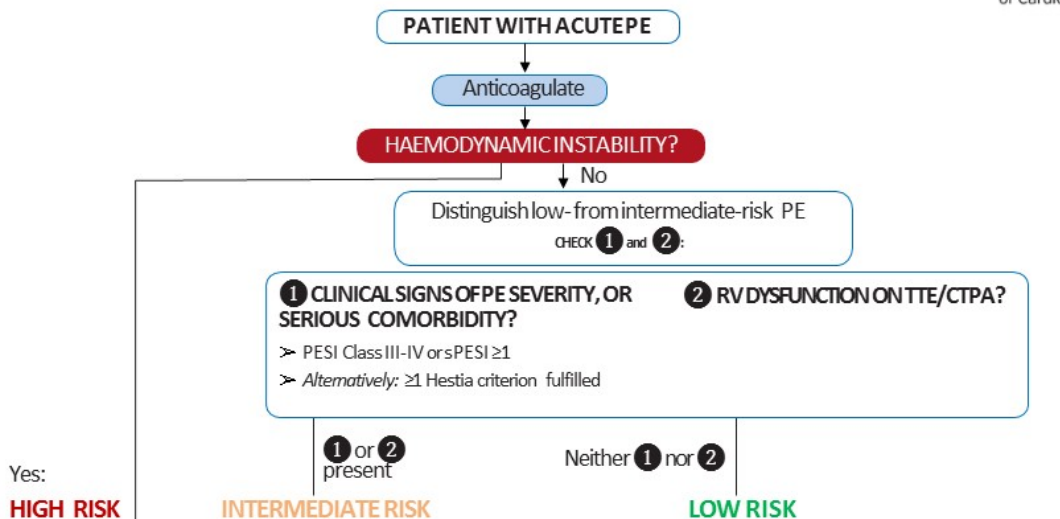


Grazie

Figure 5 Risk-adjusted management strategy for acute PE (1)



ESC
European Society
of Cardiology



Recommendations for diagnosis, risk stratification, imaging, and rhythm monitoring in patients with suspected non-ST-segment elevation acute coronary syndrome (2)

Recommendations	Class	Level
Diagnosis and risk stratification (continued)		
It is recommended to obtain an additional 12-lead ECG in case of recurrent symptoms or diagnostic uncertainty.	I	C
The ESC 0 h/1 h algorithm with blood sampling at 0 h and 1 h is recommended if an hs-cTn test with a validated 0 h/1 h algorithm is available.	I	B
Additional testing after 3 h is recommended if the first two cardiac troponin measurements of the 0 h/1 h algorithm are not conclusive and the clinical condition is still suggestive of ACS.	I	B

0 h = time of first blood test; 1 h, 2 h, 3 h = 1, 2, or 3 h after the first blood test.

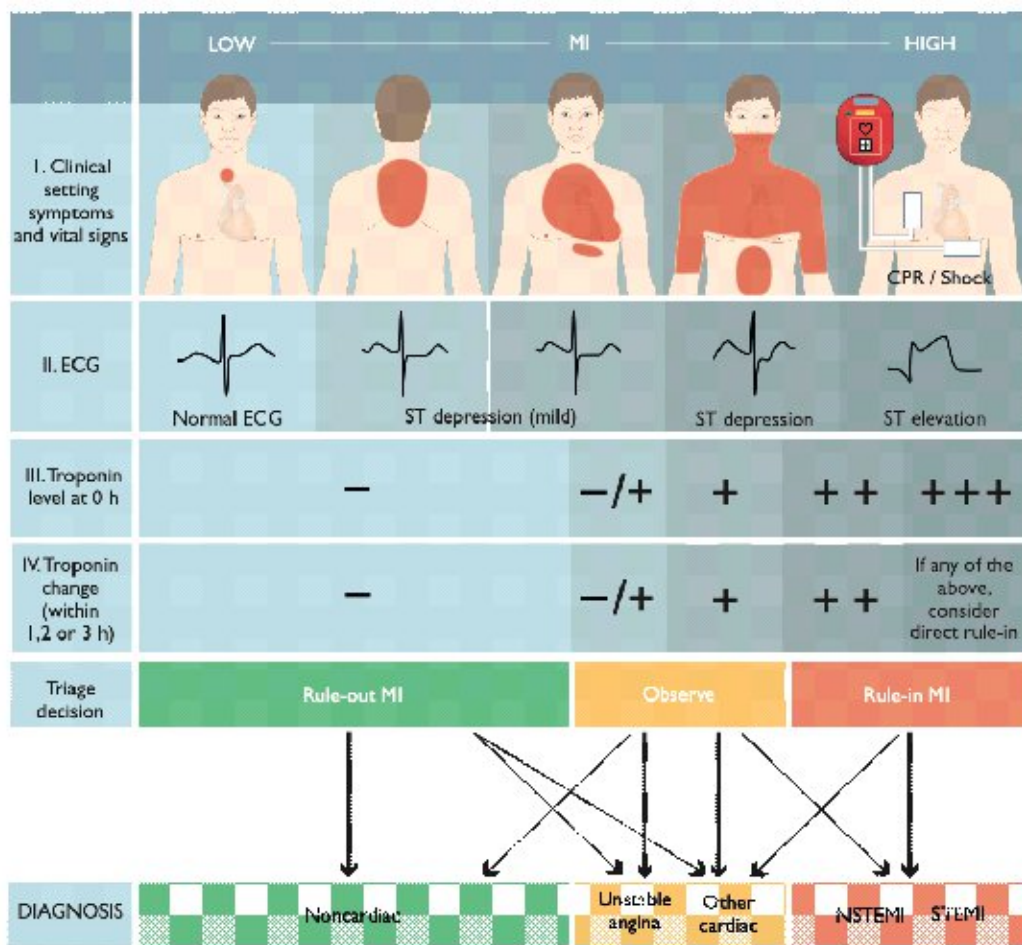


Figure 1
Diagnostic algorithm and triage in acute coronary syndrome.

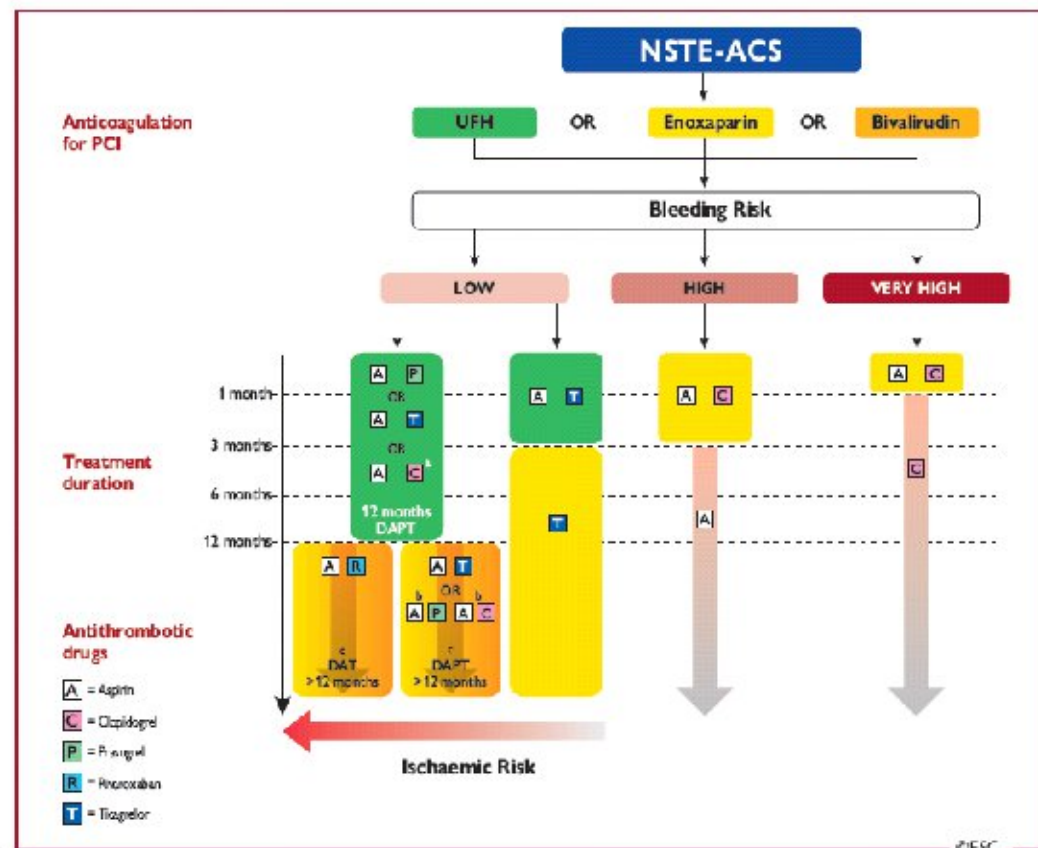


Figure 7 (1)
Algorithm for antithrombotic therapy in non-ST-segment elevation acute coronary syndrome patients without atrial fibrillation undergoing percutaneous coronary intervention.

■ = Class I ■ = Class IIa ■ = Class IIb

Very HBR is defined as recent bleeding in the past month and/or not deferrable planned surgery.

Table 9. Differential Diagnosis of Noncardiac Chest Pain

nics

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Respiratory
Pulmonary embolism
Pneumothorax/hemothorax
Pneumomediastinum
Pneumonia
Bronchitis
Pleural irritation
Malignancy
Gastrointestinal
Cholecystitis
Pancreatitis
Hiatal hernia
Gastroesophageal reflux disease/gastritis/esophagitis
Peptic ulcer disease
Esophageal spasm
Dyspepsia
Chest wall
Costochondritis
Chest wall trauma or inflammation
Herpes zoster (shingles)
Cervical radiculopathy
Breast disease
Rib fracture
Musculoskeletal injury/spasm

Psychological
Panic disorder
Anxiety
Clinical depression
Somatization disorder
Hypochondria
Other
Hyperventilation syndrome
Carbon monoxide poisoning
Sarcoidosis
Lead poisoning
Prolapsed intervertebral disc
Thoracic outlet syndrome
Adverse effect of certain medications (eg, 5-fluorouracil)
Sickle cell crisis



Table 7. Definition Used for Low-Risk Patients With Chest Pain

	Low Risk (<1% 30-d Risk for Death or MACE)
hs-cTn Based	
T-0	T-0 hs-cTn below the assay limit of detection or "very low" threshold if symptoms present for at least 3 h
T-0 and 1- or 2-h Delta	T-0 hs-cTn and 1- or 2-h delta are both below the assay "low" thresholds (>99% NPV for 30-d MACE)
Clinical Decision Pathway Based	
HEART Pathway ⁹¹	HEART score ≤ 3 , initial and serial cTn/hs-cTn < assay 99th percentile
EDACS ¹⁰⁵	EDACS score ≤ 16 ; initial and serial cTn/hs-cTn < assay 99th percentile
ADAPT ⁹⁰	TIMI score 0, initial and serial cTn/hs-cTn < assay 99th percentile
mADAPT	TIMI score 0/1, initial and serial cTn/hs-cTn < assay 99th percentile
NOTR ⁹⁴	0 factors

Diagnostic work-up of acute aortic syndrome (AAS)

Recommendations	Class	Level
History and clinical assessment		
In all patients with suspected AAS, pretest probability assessment is recommended, according to the patient's condition, symptoms, and clinical features.	I	B
Laboratory testing		
In case of suspicion of AAS, the interpretation of biomarkers should always be considered along with the pretest clinical probability.	IIa	C
In case of low clinical probability of AAS, the determination of D-dimers levels should be considered to rule-out the diagnosis when negative.	IIa	B
In case of intermediate clinical probability of AAS with a positive (point-of-care) D-dimer test, further imaging tests should be considered.	IIa	B
In patients with high probability (risk score 2 or 3) of aortic dissection, testing of D-dimers is not recommended.	III	C



Recommendations for Defining Chest Pain
 Referenced studies that support the recommendations are summarized in Online Data Supplements 1 and 2.

COR	LOE	Recommendations
1	B-NR	1. An initial assessment of chest pain is recommended to triage patients effectively on the basis of the likelihood that symptoms may be attributable to myocardial ischemia. ⁹⁻¹⁵
1	C-LD	2. Chest pain should not be described as atypical, because it is not helpful in determining the cause and can be misinterpreted as benign in nature. Instead, chest pain should be described as cardiac, possibly cardiac, or noncardiac because these terms are more specific to the potential underlying diagnosis.

Chest Pain Means More Than Pain in the Chest. Pain, pressure, tightness, or discomfort in the chest, shoulders, arms, neck, back, upper abdomen, or jaw, as well as shortness of breath and fatigue should all be considered anginal equivalents.

Women may be more likely to present with accompanying symptoms such as nausea and shortness of breath.

In patients with chest pain who are ≥75 years of age, ACS should be considered when accompanying symptoms such as shortness of breath, syncope, or acute delirium are present, or when an unexplained fall has occurred.²⁰

Recommendation for History

COR	LOE	Recommendation
1	C-LD	1. In patients with chest pain, a focused history that includes characteristics and duration of symptoms relative to presentation as well as

Table 2. Chest Pain Characteristics and Corresponding Causes

Nature
Anginal symptoms are perceived as retrosternal chest discomfort (eg, pain, discomfort, heaviness, tightness, pressure, constriction, squeezing) (See Section 1.4.2, Defining Chest Pain, in the full guideline ⁴).
Sharp chest pain that increases with inspiration and lying supine is unlikely related to ischemic heart disease (eg, these symptoms usually occur with acute pericarditis).
Onset and duration
Anginal symptoms gradually build in intensity over a few minutes.
Sudden onset of ripping chest pain (with radiation to the upper or lower back) is unlikely to be anginal and is suspicious of an acute aortic syndrome.
Fleeting chest pain—of few seconds' duration—is unlikely to be related to ischemic heart disease.
Location and radiation
Pain that can be localized to a very limited area and pain radiating to below the umbilicus or hip are unlikely related to myocardial ischemia.
Severity
Ripping chest pain ("worse chest pain of my life"), especially when sudden in onset and occurring in a hypertensive patient, or with a known bicuspid aortic valve or aortic dilation, is suspicious of an acute aortic syndrome (eg, aortic dissection).
Precipitating factors
Physical exertion or emotional stress are precipitating factors of anginal symptoms.

Recommendation for Physical Examination

COR	LOE	Recommendation
1	C-EO	1. In patients presenting with chest pain, a focused cardiovascular examination should be performed initially to aid in the diagnosis of ACS or other potentially serious causes of chest pain (eg, aortic dissection, pulmonary embolism (PE), or esophageal rupture) and to identify complications.

Clinical Syndrome	Findings
Emergency	
ACS	Diaphoresis, tachypnea, tachycardia, hypotension, crackles, S3, MR murmur ²² ; examination may be normal in uncomplicated cases
PE	Tachycardia + dyspnea—>90% of patients; pain with inspiration ²³
Aortic dissection	Connective tissue disorders (eg, Marfan syndrome), extremity pulse differential (30% of patients, type A>B) ²⁴ Severe pain, abrupt onset + pulse differential + widened mediastinum on CXR >80% probability of dissection ²⁵ Frequency of syncope >10% ²⁴ , AR 40%–75% (type A) ²⁶
Esophageal rupture	Emesis, subcutaneous emphysema, pneumothorax (20% patients), unilateral decreased or absent breath sounds

Causes

Nature
Anginal symptoms are perceived as retrosternal chest discomfort (eg, pain, discomfort, heaviness, tightness, pressure, constriction, squeezing) (See Section 1.4.2, Defining Chest Pain, in the full guideline).
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Severity
Ripping chest pain ("worst chest pain of my life"), especially when sudden in onset and occurring in a hypertensive patient, or with a known bicuspid aortic valve or aortic dilation, is suspicious of an acute aortic syndrome (eg, aortic dissection).
Precipitating factors
Physical exercise or emotional stress are common triggers of anginal symptoms.
Occurrence at rest or with minimal exertion associated with anginal symptoms usually indicates ACS.
Positional chest pain is usually nonischemic (eg, musculoskeletal).
Relieving factors
Relief with nitroglycerin is not necessarily diagnostic of myocardial ischemia and should not be used as a diagnostic criterion.
Associated symptoms
Common symptoms associated with myocardial ischemia include, but are not limited to, dyspnea, palpitations, diaphoresis, lightheadedness, presyncope or syncope, upper abdominal pain, or heartburn unrelated to meals and nausea or vomiting.
Symptoms on the left or right side of the chest, stabbing, sharp pain, or discomfort in the throat or abdomen may occur in patients with diabetes, women, and elderly patients.