SALA CONCORDIA B

URGENZE CARDIOVASCOLARI

Moderatori: **Francesco Rocco Pugliese, Furio Colivicchi** (ANMCO)

Simone Vanni

Il dolore toracico

XII congresso nazionale
simeu
RICCIONE 13-15 MAGGIO 2022

Il dolore toracico

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SIMEU
società italiana medicina d'emergenza-urgenza

Riccione 2022

Chest pain: Quale porta?

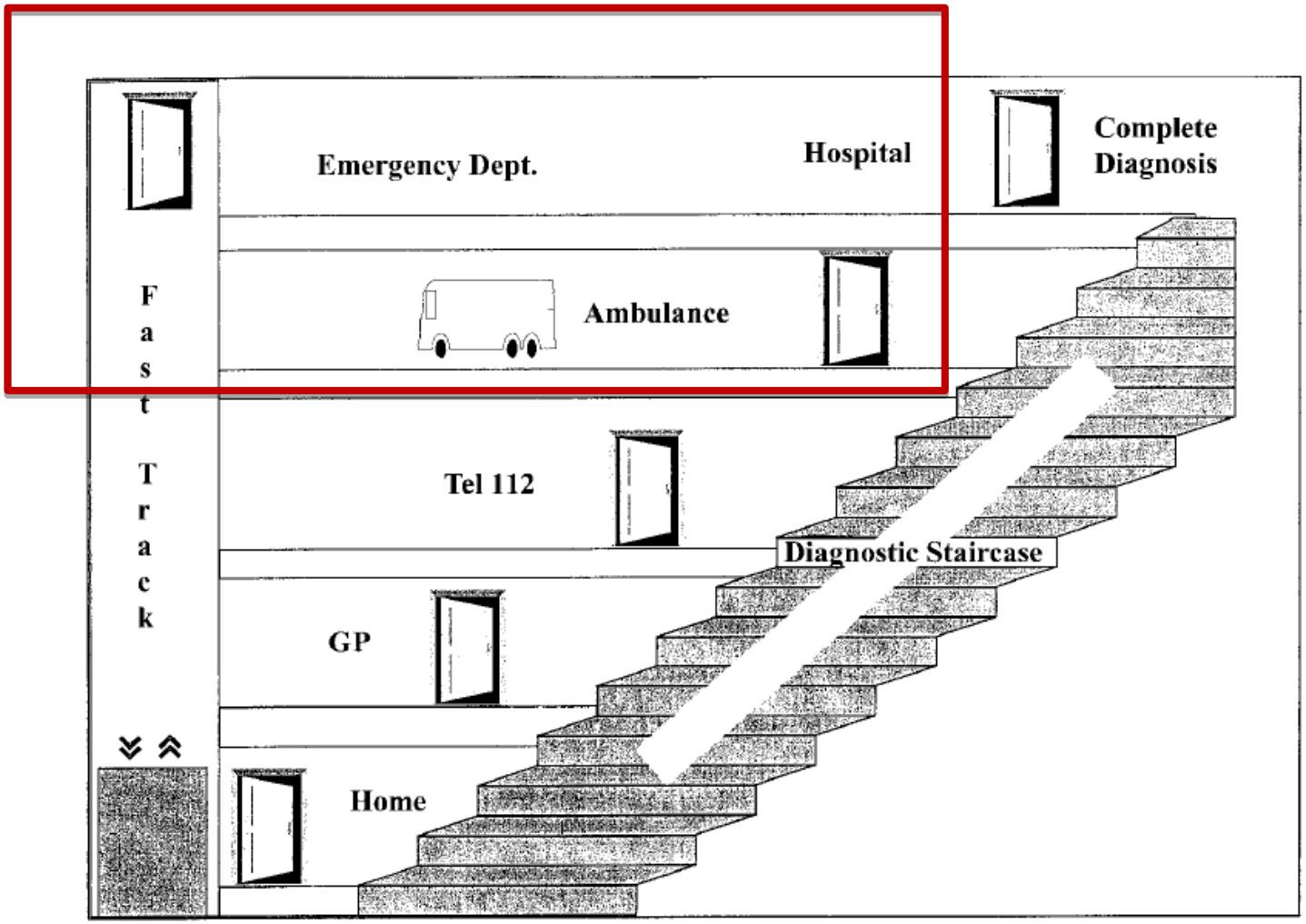


Figure 1 The five doors representing five different levels of decision making.

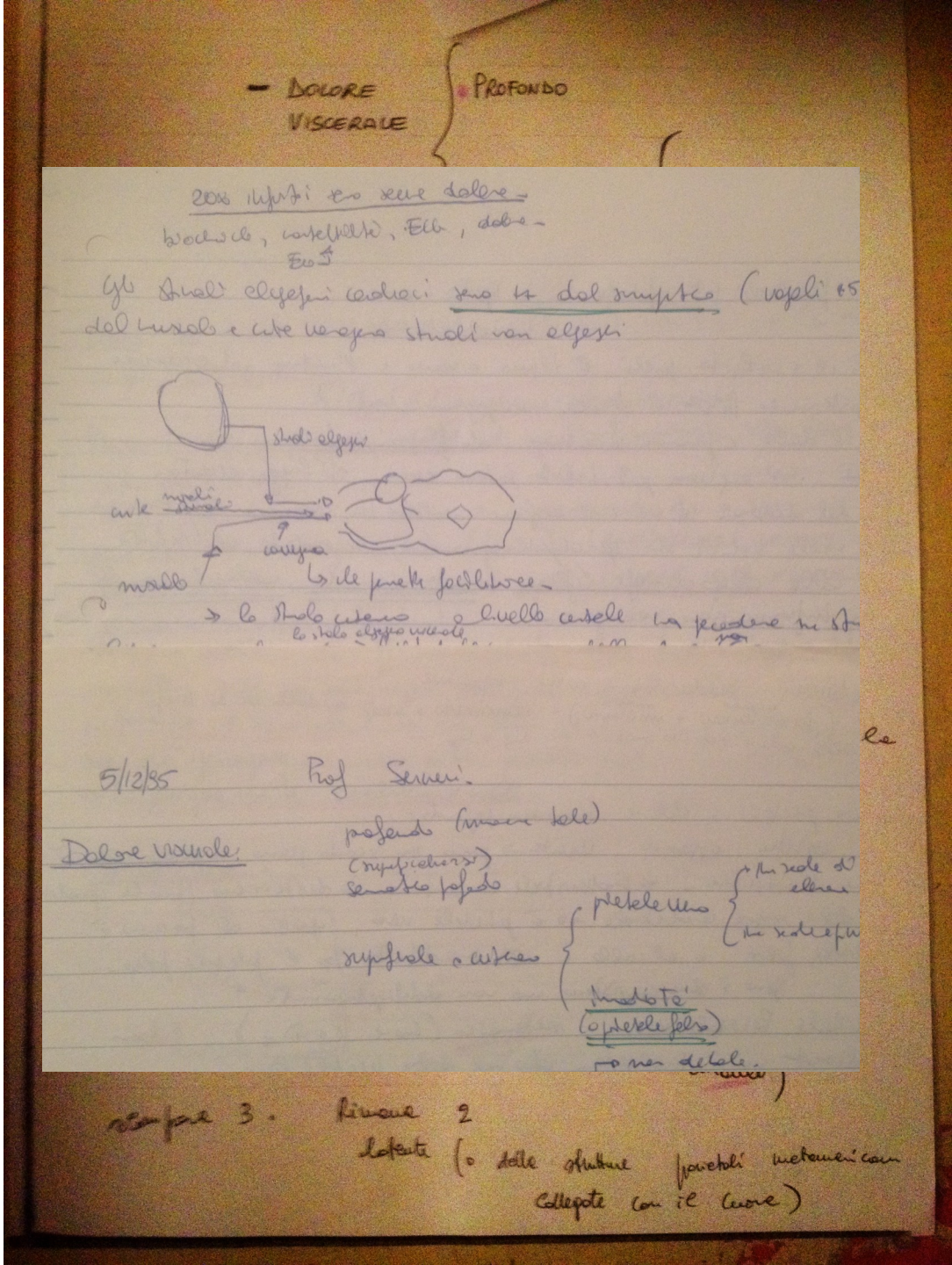
ESC 2002

Table 1 Aetiology to chest pain in various clinical settings

Aetiology	General practitioner (1–3) %	Dispatch centre (4) %	Ambulance crew (5) %	Emergency department (6) %
Cardiac	20	60	69	45
Musculoskeletal	43	6	5	14
Pulmonary	4	4	4	5
Gastro-intestinal	5	6	3	6
Psychiatric	11	5	5	8
Other	16	19	18	26

1. Lamberts *et al.*[7]
2. Klinkman *et al.*[8]
3. Svavarsdottir *et al.*[9]
4. Herlitz *et al.*[10]

Dolore toracico 1995



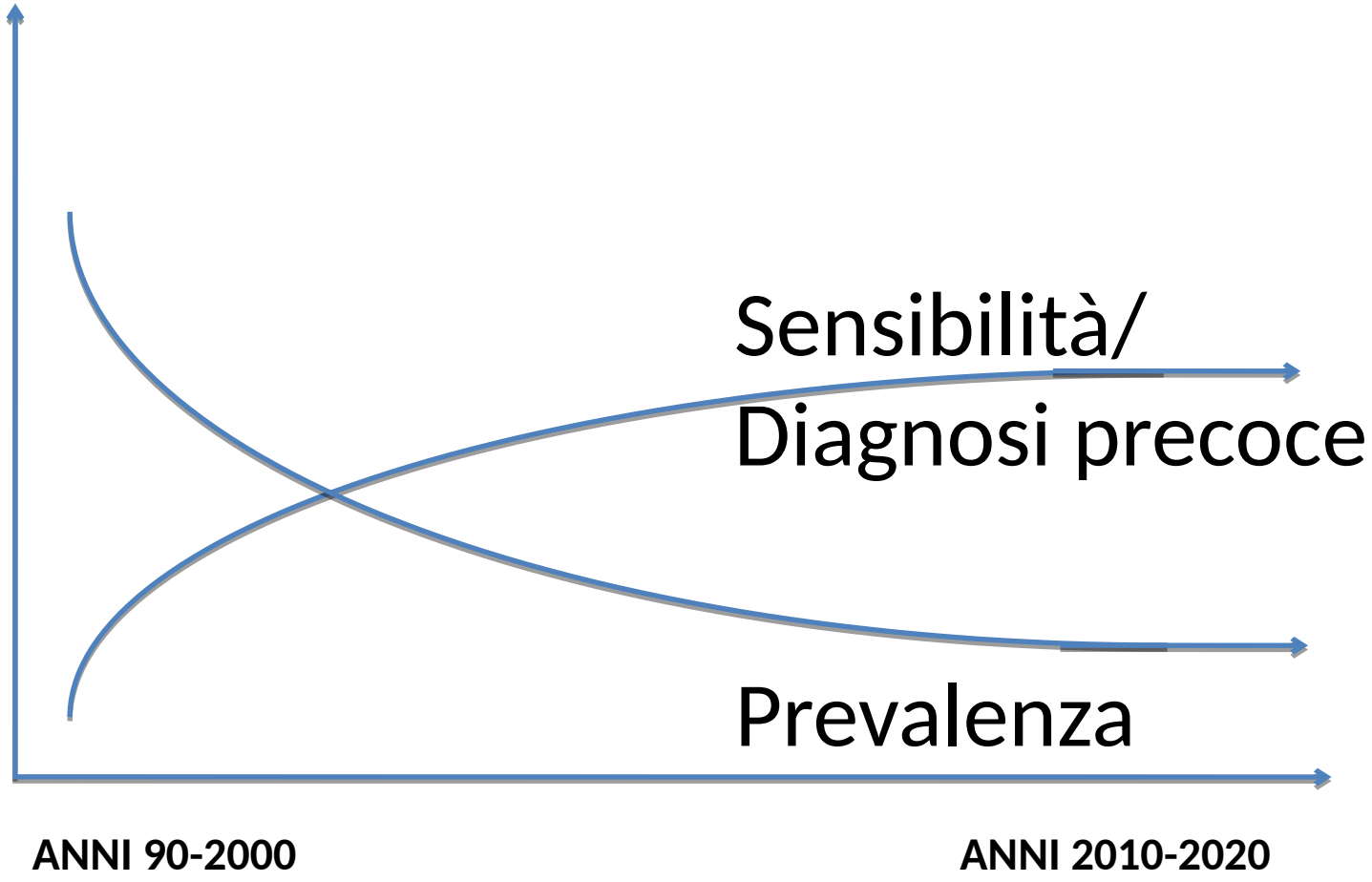
The rational clinical examination. Is this patient having a myocardial infarction?

JAMA 1998

- When faced with a patient with acute chest pain, clinicians must distinguish myocardial infarction (MI) from all other causes of acute chest pain.
- Despite advances in investigative modalities, **a focused history and physical examination** followed **by an ECG** remain the key tools for the diagnosis of MI.
- **The most powerful features that increase the probability of MI, and their associated likelihood ratios (LRs)**, are new ST-segment elevation (LR range, 5.7-53.9); new Q wave (LR range, 5.3-24.8); **chest pain radiating to both the left and right arm simultaneously (LR, 7.1);** presence of a third heart sound (LR, 3.2); and hypotension (LR, 3.1). **The most powerful features that decrease the probability of MI are a normal ECG result** (LR range, 0.1-0.3), **pleuritic chest pain** (LR, 0.2), **chest pain reproduced by palpation** (LR range, 0.2-0.4), sharp or stabbing chest pain (LR, 0.3), and positional chest pain (LR, 0.3).

Panju AA et al

Diagnosi SCA nei DEA



Does This Patient With Chest Pain Have Acute Coronary Syndrome? The Rational Clinical Examination Systematic Review

JAMA 2015

- **About 10%** of patients with acute chest pain are ultimately diagnosed with acute coronary syndrome (ACS). Early, accurate estimation of the probability of ACS ….ensure that high-risk patients are promptly treated.
- Among patients with suspected ACS presenting to emergency departments, **the initial history, physical examination,** and **electrocardiogram alone did not confirm or exclude the diagnosis of ACS**. Instead, the HEART or TIMI risk scores, which incorporate the **first cardiac troponin,** provided more diagnostic information.
- The most useful for identifying patients less likely to have ACS were the low-risk range HEART score (0-3) (LR, 0.20 [95% CI, 0.13-0.30]), low-risk range TIMI score (0-1) (LR, 0.31 [95% CI, 0.23-0.43]),

Fanaroff et al

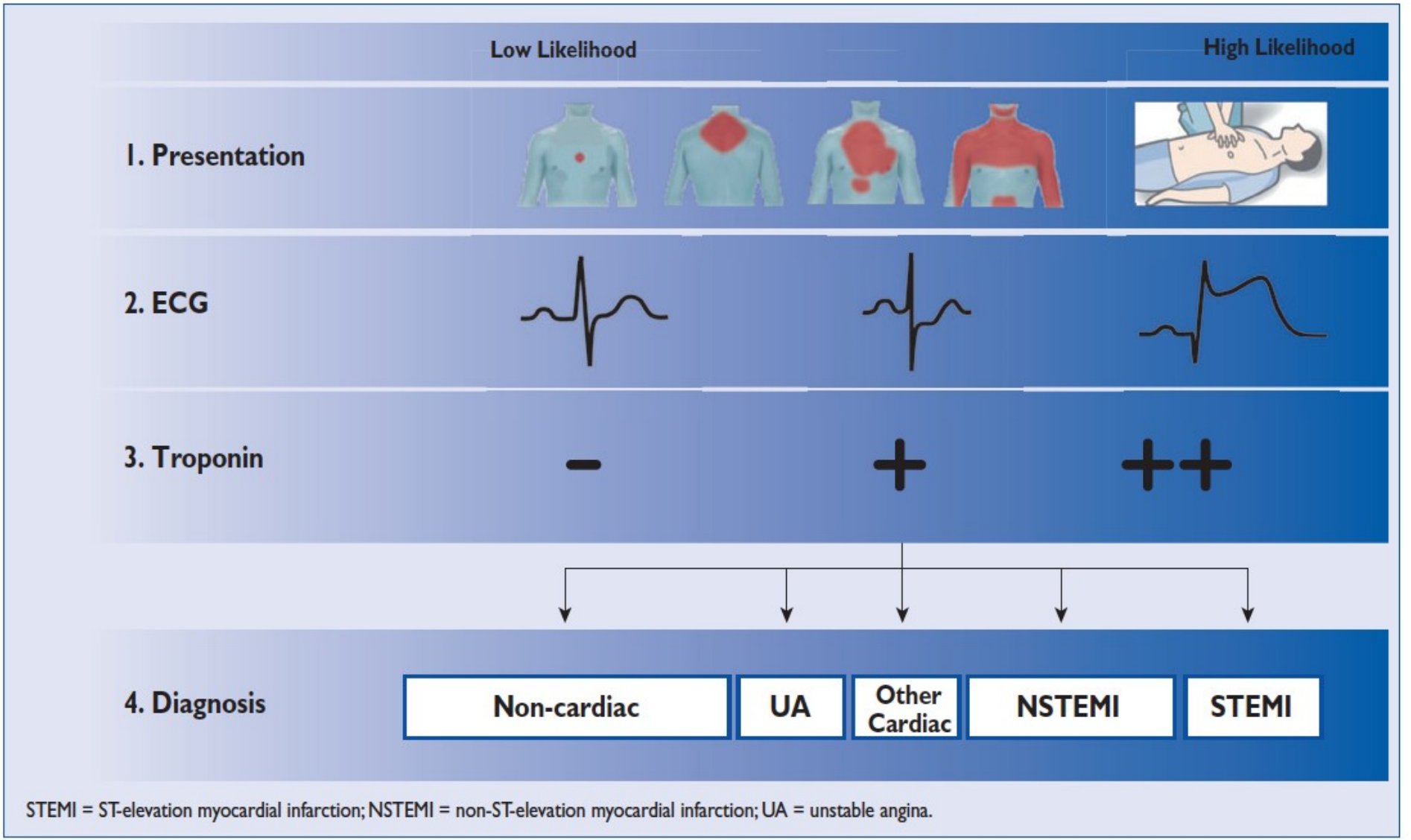
ANMCO/SIMEU 2016

Il dolore/discomfort toracico distinto in acuto (in atto) o stabile (presente nelle ore precedenti) può essere categorizzato in tipico ed atipico:

- il sintomo *tipico*, descritto come senso di pressione toracica anteriore o posteriore, restringimento intratoracico, senso di "morsa interna", o simile a quello di precedente episodio ischemico, oppure irradiato ad entrambe le braccia, aumenta modestamente la probabilità di SCA (LR+ 1.9-2.6)[4];
- il sintomo *atipico*, descritto come trafittura, e il dolore di tipo pleuritico o a puntura di spillo, è associato a minore probabilità di SCA (LR+ 0.35-0.61)[4].

La diaforesi identifica una probabilità leggermente più elevata di SCA (LR+ 1.3-1.4)[4,21,22]. La presenza di sintomi che

ESC guidelines 2015



STEMI = ST-elevation myocardial infarction; NSTEMI = non-ST-elevation myocardial infarction; UA = unstable angina.

BMJ Open

Diagnostic performance of reproducible chest wall tenderness to rule out acute coronary syndrome in acute chest pain: a prospective diagnostic study

Results: 121 patients (60.3% male, median age 47 years, IQR 34–66.5 years) were included. The prevalence of ACS was 11.6%. Non-reproducible CWT had a high sensitivity of 92.9% (95% CI 66.1% to 98.8%) for ACS and the presence of reproducible CWT ruled out ACS (p=0.003) with a high negative predictive value (98.1%, 95% CI 89.9% to 99.7%). Conversely non-reproducible CWT ruled in ACS with low specificity (48.6%, 95% CI 38.8% to 58.5%) and low positive predictive value (19.1%, 95% CI 10.6% to 30.5%).

auffe,[1]

To cite: Gräni C, Senn O, Bischof M, *et al*. Diagnosti performance of reproducib chest wall tenderness to r out acute coronary syndro in acute chest pain: a prospective diagnostic stu *BMJ Open* 2015;**5**:e00744 doi:10.1136/bmjopen-201 007442

study

wledge with a for the evalu- n palpation in out acute cor-

evious studies rness helps to

NICE guidelines

- **1.2.5** Use of biochemical markers for diagnosis of an acute coronary syndrome
- 1.2.5.1 **Do not use high-sensitivity troponin tests for people in whom ACS is not suspected. [new 2016]**
- 1.2.5.2 For people at high or moderate risk of MI (as indicated by a validated tool), perform high-sensitivity troponin tests as recommended in the NICE diagnostics guidance on myocardial infarction (DG15). **[new 2016]**

HEART score

Table 1
The HEART score for chest pain patients at the emergency department.

History (=anamnesis)	Highly suspicious	2
	Moderately suspicious	1
	Slightly or non-suspicious	0
ECG	Significant ST-depression	2
	Nonspecific repolarization disturbance	1
	Normal	0
Age	≥65 years	2
	>45–<65 years	1
	≤45 years	0
Risk factors	≥3 risk factors, *or* history of atherosclerotic disease	2
	1 or 2 risk factors	1
	No risk factors known	0
Troponin	≥3× normal limit	2
	>1–<3× normal limit	1
	≤Normal limit	0
Total		

Emergency department residents of participating hospitals were instructed carefully about the admission Case Report Form (CRF) and interpretation of the elements of patient history. The resident entered the initial patient data in writing on the admission CRF, upon arrival of the patient. The CRF consisted of separate entries for classical

B.E. Backus et al. / International Journal of Cardiology 168 (2013) 2153–2158

Confronto scores

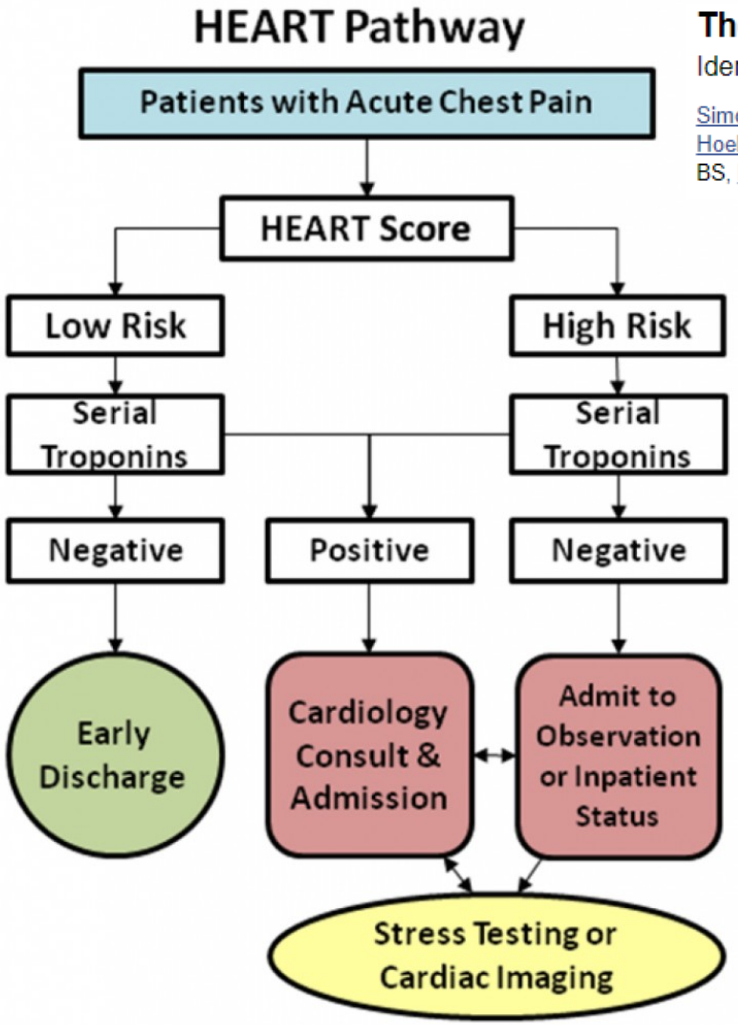
Table 4
Average values of the three scores in patients with chest pain presenting at the emergency department in groups with and without MACE.

	Total study population	No MACE<6w n=1981	MACE<6w n=407	C-statistic	p value
HEART	4.4 (2.2)	3.96 (2.0)	6.54 (1.7)	0.83	<0.0001
TIMI	2.5 (1.7)	2.21 (1.6)	3.68 (1.4)	0.75	<0.0001
GRACE	99.9 (36.1)	95.5 (35.0)	121.2 (34.0)	0.70	<0.0001

Averages are given as mean (SD).

3.6. Predictive values of low scores

The low risk boundaries for all scores were set at a risk of MACE<5%. In the group with TIMI scores of 0–1, which accounted for 34.0% of the study population, 23/811 (2.8%) had a MACE. The 14.0% of the patients who had GRACE scores 0–60 had MACE in 10/335 (2.9%) of the cases. The group with a low HEART score (values 0–3) represents 36.4% of the study population. Six-week MACE occurred in 15/870 (1.7%) of these patients. This included nine AMIs, nine PCI, three CABG and one



The HEART Pathway Randomized Trial

Identifying Emergency Department Patients With Acute Chest Pain for Early Discharge

Simon A. Mahler, MD, MS, Robert F. Riley, MD, Brian C. Hiestand, MD, MPH, Gregory B. Russell, MS, James W. Hoekstra, MD, Cedric W. Lefebvre, MD, Bret A. Nicks, MD, David M. Cline, MD, Kim L. Askew, MD, Stephanie B. Elliott, BS, David M. Herrington, MD, MHS, Gregory L. Burke, MD, and Chadwick D. Miller, MD, MS

- Compara la HEART Pathway versus Usual care (ACC/AHA)
- Include 282 pazienti
- IDENTIFICA il **46.8%** di pazienti a BASSO RISCHIO

Descrizione	HEART	Usual Care	Differenza
Test provocativi/imaging	56,7%	68,8%	- 12,1%
Dimissioni precoci	39,7%	18,4%	+ 21,3%
Degenza Media	9,9 ore	21,9 ore	- 12 ore
MACE in Low risk	0		------

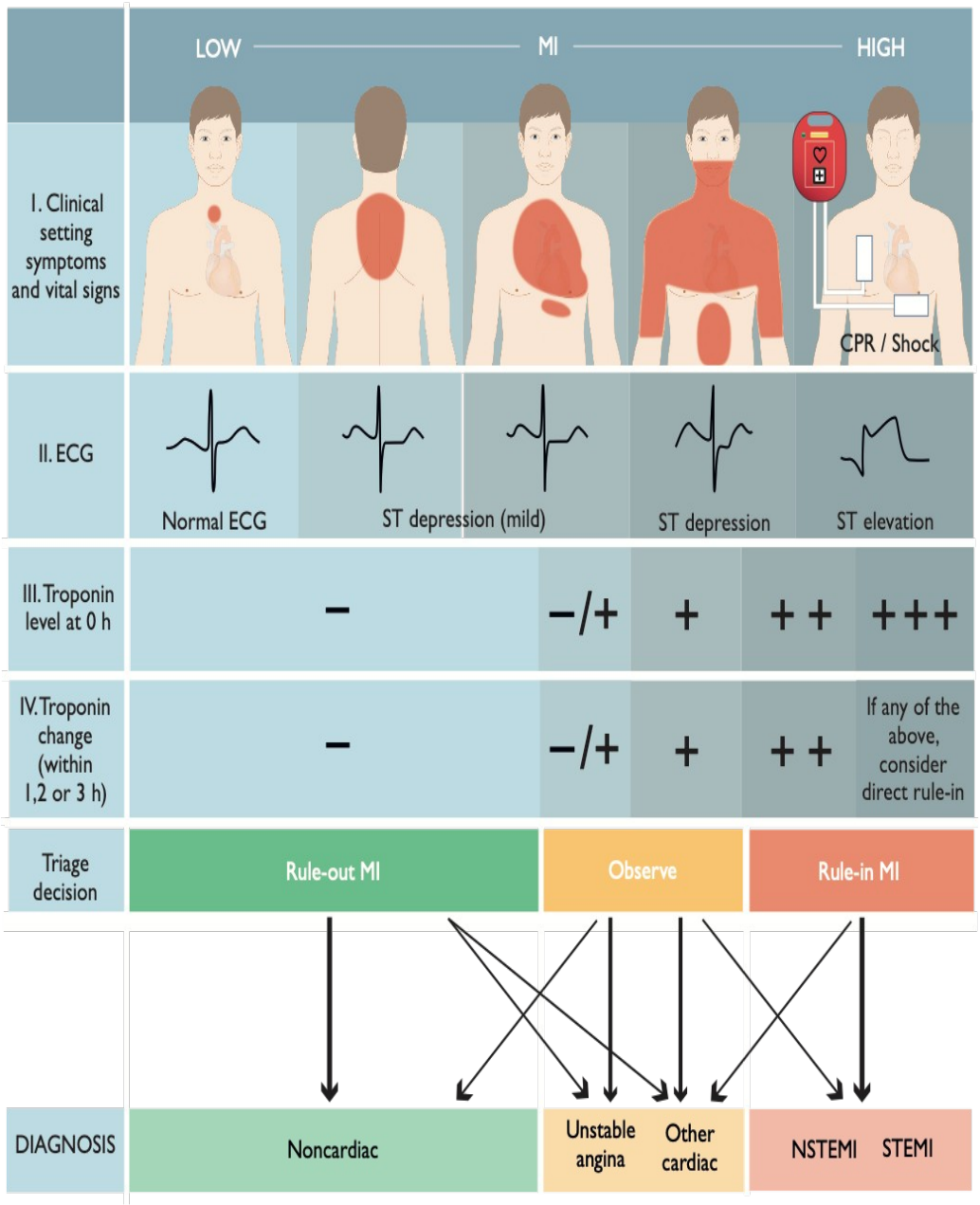


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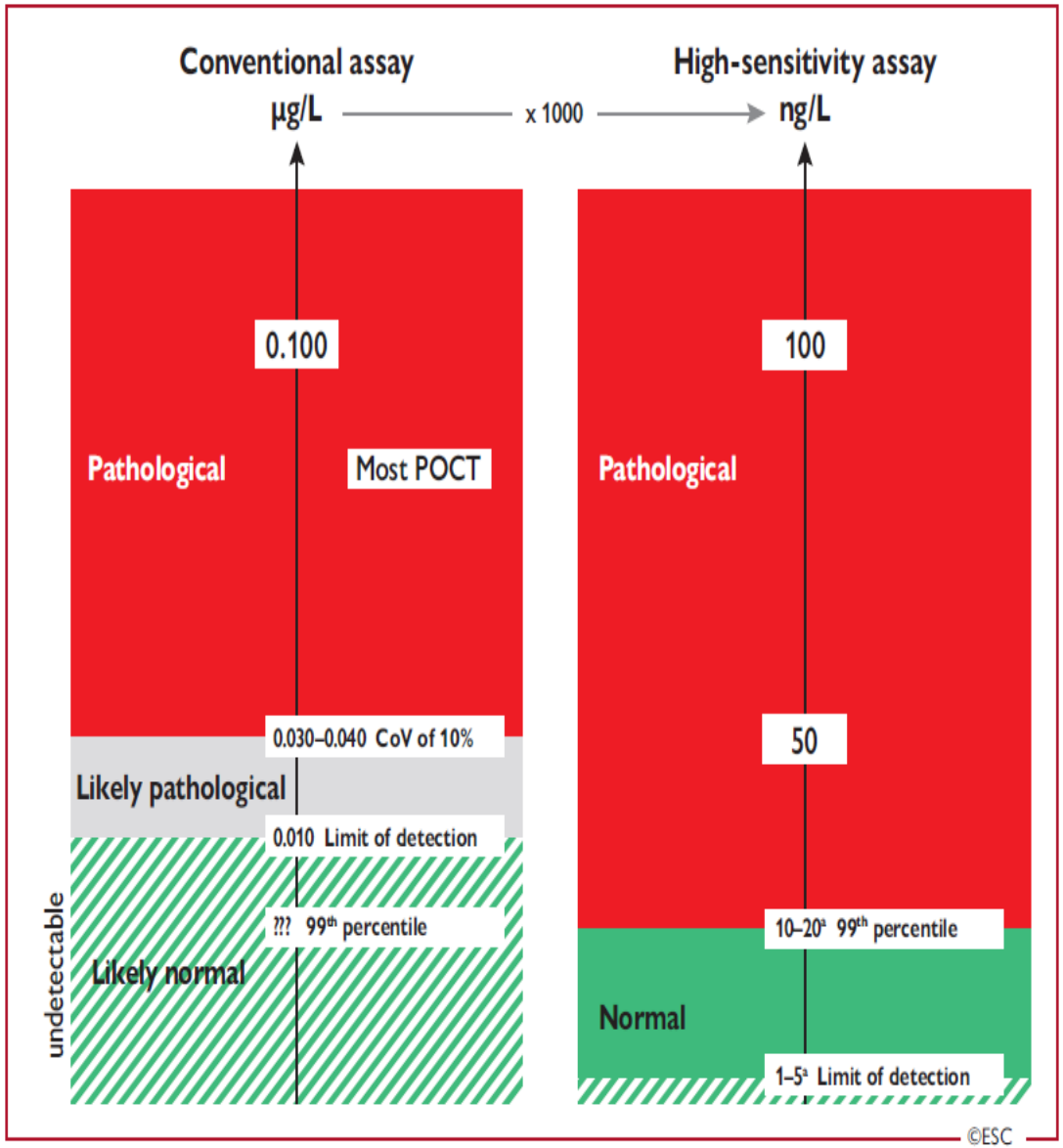
Figure 1

Diagnostic algorithm and triage in acute coronary syndrome.

www.escardio.org/guidelines

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation (European Heart Journal 2020 - doi/10.1093/eurheartj/ehaa575)

Figure 2 Value of high-sensitivity cardiac troponin.



hs-cTn assays (right) are reported in ng/L and provide identical information as conventional assays (left, reported in µg/L) if the concentration is substantially elevated, e.g. above 100 ng/L. In contrast, only hs-cTn allows a precise differentiation between 'normal' and mildly elevated. Therefore, hs-cTn detects a relevant proportion of patients with previously undetectable cardiac troponin concentrations with the conventional assay who have hs-cTn concentrations above the 99th percentile possibly related to AMI.
??? = unknown due to the inability of the assay to measure in the normal range

[a]The limit of detection varies among the different hs-cTn assays between 1 ng/L and 5 ng/L. Similarly, the 99th percentile varies among the different hs-cTn assays, mainly being between 10 ng/L and 20 ng/L.

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation (European Heart Journal 2020 - doi/10.1093/eurheartj/ehaa575)

Table 1 Clinical implications of high-sensitivity cardiac troponin assays (1)

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Compared with standard cardiac troponin assays, hs-cTn assays:
• Have higher NPV for AMI.
• Reduce the 'troponin-blind' interval leading to earlier detection of AMI.
• Result in ~4% absolute and ~20% relative increases in the detection of type 1 MI and a corresponding decrease in the diagnosis of unstable angina.
• Are associated with a 2-fold increase in the detection of type 2 MI.

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation (European Heart Journal 2020 - doi/10.1093/eurheartj/ehaa575)

Cause di rialzo della troponina non correlate a SCA

- Tachiaritmie
- Scompenso cardiaco
- Emergenze ipertensive
- Patologie critiche (es sepsi)
- Miocarditi , miopericarditi, endocarditi
- S. Takotsubo
- Valvulopatie
- Dissezione aortica
- Embolia polmonare
- Insufficienza renale associata a cardiopatia

- Ictus ischemico/emorragico
- Contusione cardiaca o procedure invasive (cardioversione, CABG, PCI, ablazione, pacing)

- Ipo/ipertiroidismo
- Patologie infiltrative (amiloidosi,sarcoidosi)
- Cardiotossicità da farmaci (doxorubicina, 5-fluorouracile)
- Rabdomiolisi
- Allenamenti di resistenza estrema

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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.

[a]Only applicable if CPO >3 h.

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation (European Heart Journal 2020 - doi/10.1093/eurheartj/ehaa575)

Table 3 Assay specific cut-off levels in ng/l within the 0 h/1 h

0 h/1 h algorithm	Very low	Low	No 1h Δ	High	1h Δ
hs-cTn T (Elecsys; Roche)	<5	<12	<3	≥52	≥5
hs-cTn I (Architect; Abbott)	<4	<5	<2	≥64	≥6
hs-cTn I (Centaur; Siemens)	<3	<6	<3	≥120	≥12
hs-cTn I (Access; Beckman Coulter)	<4	<5	<4	≥50	≥15
hs-cTn I (Clarity; Singulex)	<1	<2	<1	≥30	≥6
hs-cTn I (Vitros; Clinical Diagnostics)	<1	<2	<1	≥40	≥4
hs-cTn I (Pathfast; LSI Medience)	<3	<4	<3	≥90	≥20
hs-cTn I (TriageTrue; Quidel)	<4	<5	<3	≥60	≥8

These cut-offs apply irrespective of age and renal function. Optimized cut-offs for patients above 75 years of age and patients with renal dysfunction have been evaluated, but not consistently shown to provide better balance between safety and efficacy as compared to these universal cut-offs. The algorithms for additional assays are in development.
hs-cTn = high-sensitivity cardiac troponin; TBD = to be determined.

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation (European Heart Journal 2020 - doi/10.1093/eurheartj/ehaa575)

Table 3 Assay specific cut-off levels in ng/l within the 0 h/1 h and 0 h/2 h algorithms (2)

0 h/2 h algorithm	Very low	Low	No 2h Δ	High	2h Δ
hs-cTn T (Elecsys; Roche)	<5	<14	<4	≥52	≥10
hs-cTn I (Architect; Abbott)	<4	<6	<2	≥64	≥15
hs-cTn I (Centaur; Siemens)	<3	<8	<7	≥120	≥20
hs-cTn I (Access; Beckman Coulter)	<4	<5	<5	≥50	≥20
hs-cTn I (Clarity; Singulex)	<1	Tbd	Tbd	≥30	Tbd
hs-cTn I (Vitros; Clinical Diagnostics)	<1	Tbd	Tbd	≥40	Tbd
hs-cTn I (Pathfast; LSI Medience)	<3	Tbd	Tbd	≥90	Tbd
hs-cTn I (TriageTrue; Quidel)	<4	Tbd	Tbd	≥60	Tbd

These cut-offs apply irrespective of age and renal function. Optimized cut-offs for patients above 75 years of age and patients with renal dysfunction have been evaluated, but not consistently shown to provide better balance between safety and efficacy as compared to these universal cut-offs. The algorithms for additional assays are in development.
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2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation (European Heart Journal 2020 - doi/10.1093/eurheartj/ehaa575)

Recommendations for diagnosis, risk stratification, imaging, and rhythm monitoring in patients with suspected non-ST-segment elevation acute coronary syndrome (4)

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Recommendations	Class	Level
Diagnosis and risk stratification (continued)		
The routine use of copeptin as an additional biomarker for the early rule-out of MI should be considered where hs-cTn assays are not available.	IIa	B
It should be considered to use established risk scores for prognosis estimation.	IIa	C
For initial diagnostic purposes, it is not recommended to routinely measure additional biomarkers such as h-FABP or copeptin, in addition to hs-cTn.	III	B

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

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation (European Heart Journal 2020 - doi/10.1093/eurheartj/ehaa575)

Eco: a chi?

In conditions where the clinical history, ECG, and biochemical measurements for myocardial damage are equivocal or unavailable, imaging techniques may be particularly helpful in identifying low-risk patients, who can be eligible for early discharge or undergo early stress testing and avoid hospital admission, potentially reducing the utilization of hospital resources[89,90] (Class IIb, level B). Their use, however, depends on institutional accessibility, cost, and individual expertize.

Eur Heart J, Vol. 23, issue 15, August 2002

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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.

[a]Only applicable if CPO >3 h.

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation (European Heart Journal 2020 - doi/10.1093/eurheartj/ehaa575)

Recommendations for diagnosis, risk stratification, imaging, and rhythm monitoring in patients with suspected non-ST-segment elevation acute coronary syndrome (5)

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Recommendations	Class	Level
Imaging		
In patients presenting with cardiac arrest or haemodynamic instability of presumed cardiovascular origin, echocardiography is recommended and should be performed by trained physicians immediately following a 12-lead ECG.	I	C
In patients with no recurrence of chest pain, normal ECG findings, and normal levels of cardiac troponin (preferably high sensitivity), but still with a suspected ACS, a non-invasive stress test (preferably with imaging) for inducible ischaemia or CCTA is recommended before deciding on an invasive approach.	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.

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation (European Heart Journal 2020 - doi/10.1093/eurheartj/ehaa575)

Recommendations for diagnosis, risk stratification, imaging, and rhythm monitoring in patients with suspected non-ST-segment elevation acute coronary syndrome (6)

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Recommendations	Class	Level
Imaging (continued)		
Echocardiography is recommended to evaluate regional and global LV function and to rule in or rule out differential diagnoses.[a]	I	C
CCTA is recommended as an alternative to ICA to exclude ACS when there is a low-to-intermediate likelihood of CAD and when cardiac troponin and/or ECG are normal or inconclusive.	I	A

0 h = time of first blood test; 1 h, 2 h, 3 h = 1, 2, or 3 h after the first blood test.
[a]Does not apply to patients discharged the same day in whom NSTEMI has been ruled out.

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation (European Heart Journal 2020 - doi/10.1093/eurheartj/ehaa575)

Chi dimettere?

The patient can be discharged home if she/he has been asymptomatic for 6 h in the follow-up, if there are no new ischaemic ECG changes and if there are no biochemical signs of recent myocardial necrosis. An exercise test can be done before discharge and it may be useful to determine severity of symptoms and ischaemia at exercise (Table 7).

Chest pain units

Chest pain is one of the most common symptoms in emergency departments comprising 5–20% of emergency department visits[21,171], yet only 10–15% of chest pain patients have AMI[131,172,173]. Attempts have therefore

Eur Heart J, Vol. 23, issue 15, August 2002

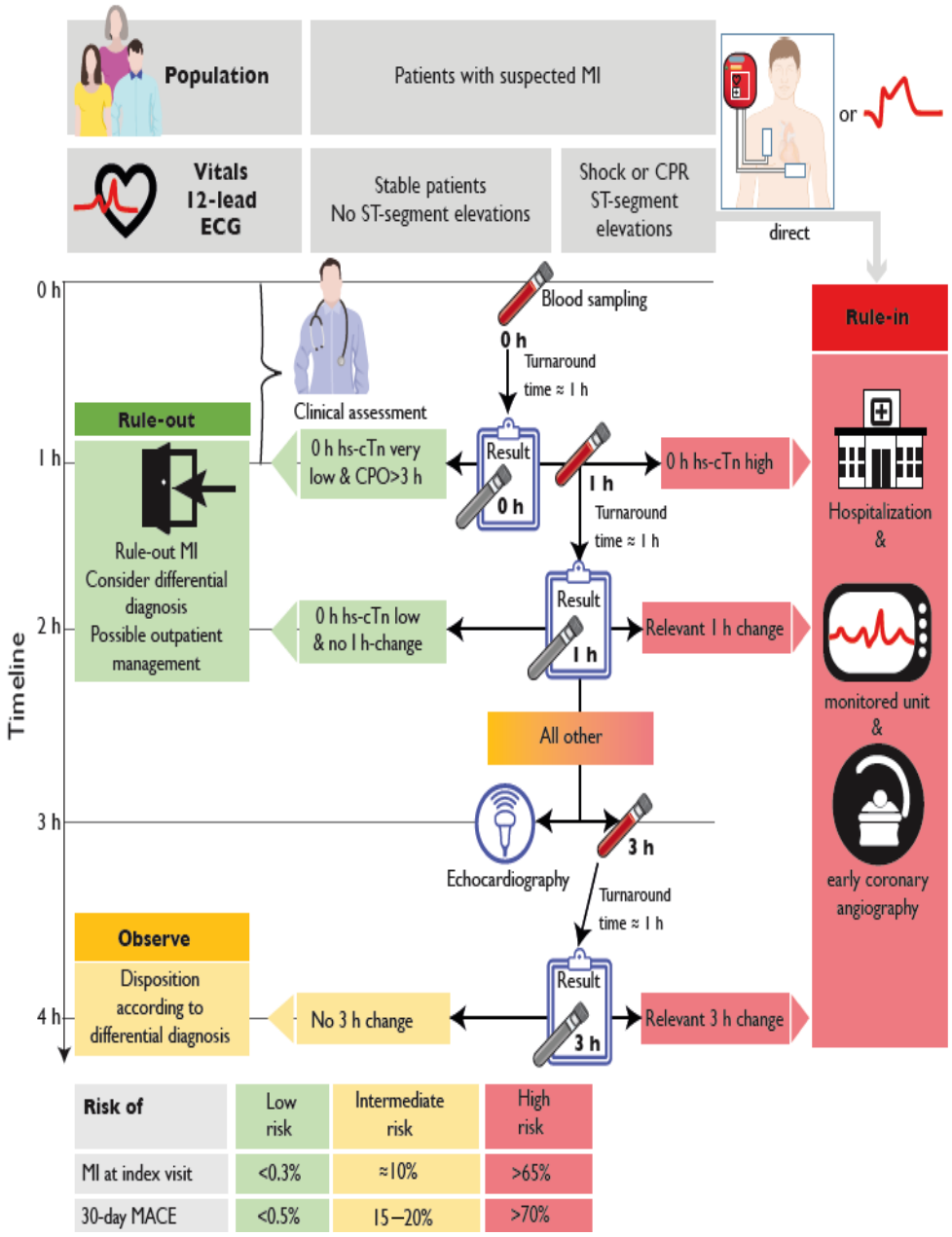
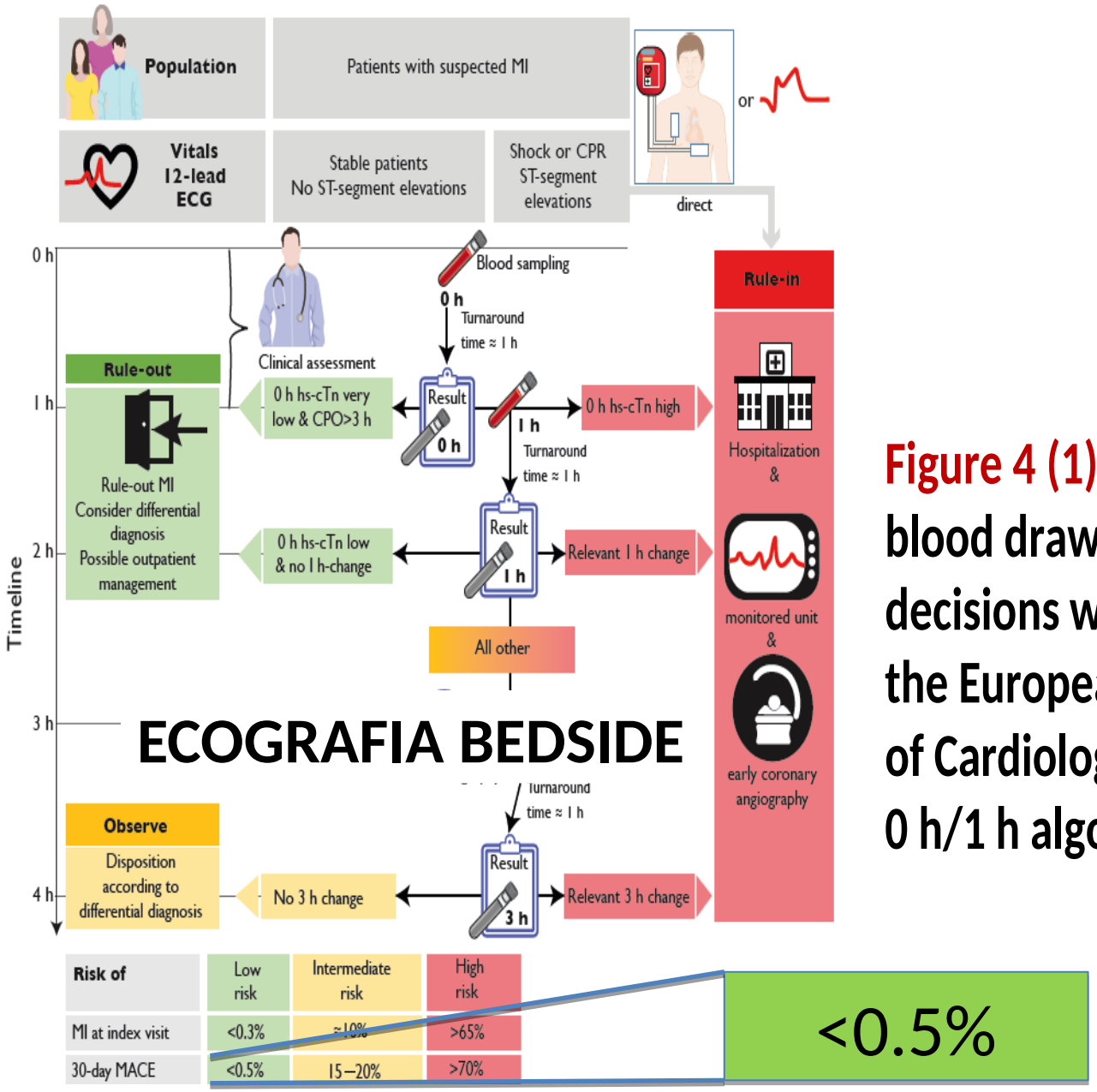


Figure 4 (1) Timing of the blood draws and clinical decisions when using the European Society of Cardiology 0 h/1 h algorithm.

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation (European Heart Journal 2020 - doi/10.1093/eurheartj/ehaa575)



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CENTRO STUDI SIMEU

Tra il dire e il fare c'è di mezzo.....
.....
.... il cominciare

Pier Luigi Ricci