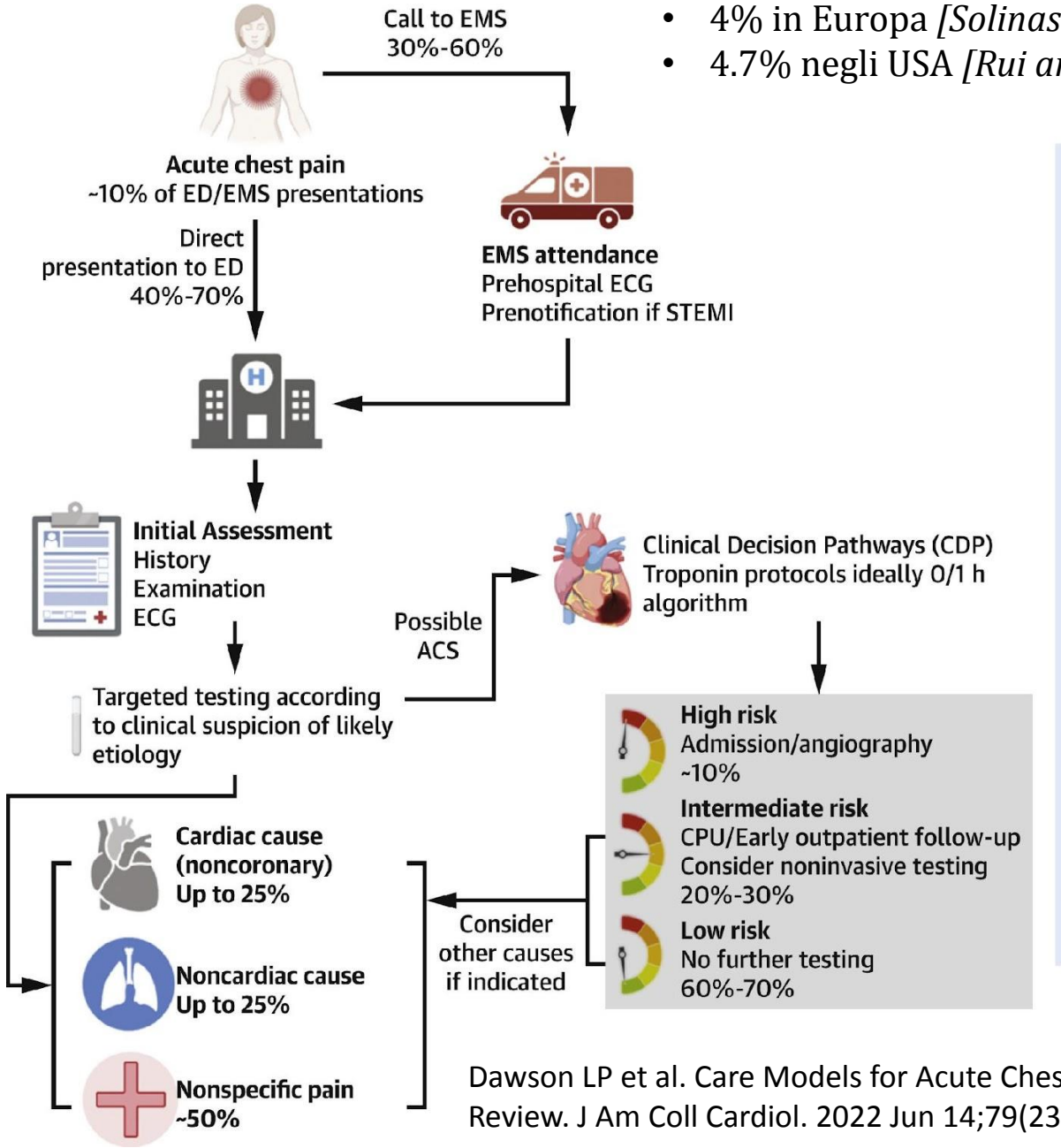
Fulvio Morello
Università degli Studi di Torino, Dipartimento di Scienze Mediche
Dipartimento di Emergenza e Accettazione, S.C. Medicina d'Urgenza U (MECAU)
Ospedale Molinette, A.O.U. Città della Salute e della Scienza di Torino

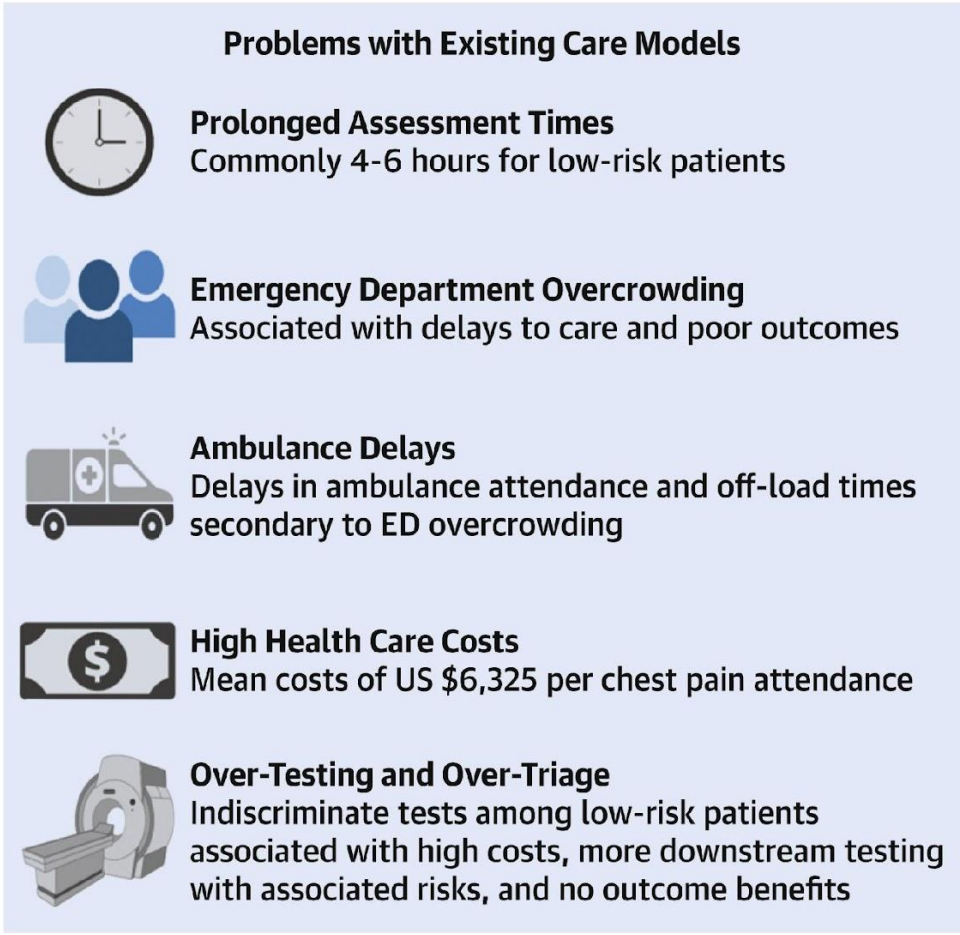
Il dolore toracico acuto nel D.E.A.

outcome e (in)efficienza assistenziale

XIII congresso nazionale
simeu
GENOVA 30 MAG - 1 GIU 2024

- 4% in Europa *[Solinas et al., 2003; Martínez-Sellés et al. 2008]*
- 4.7% negli USA *[Rui and Kang, 2017]*



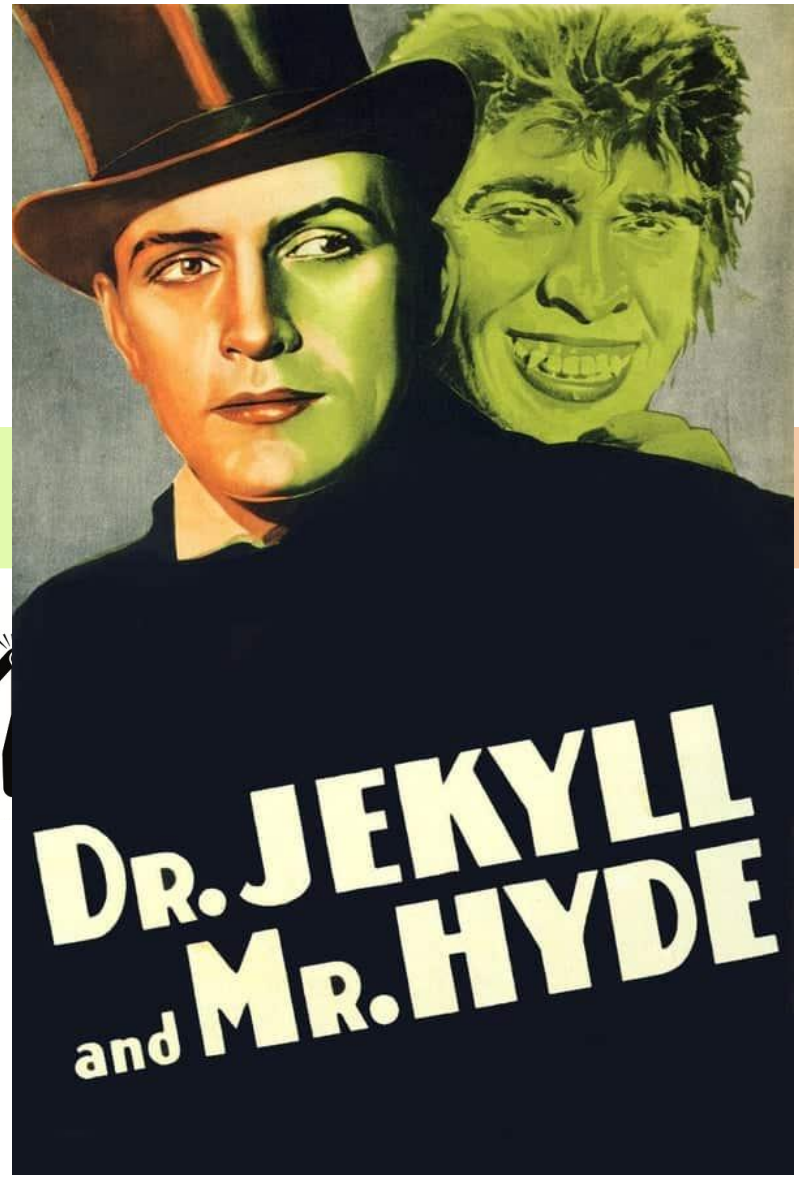


Dawson LP et al. Care Models for Acute Chest Pain That Improve Outcomes and Efficiency: JACC State-of-the-Art Review. J Am Coll Cardiol. 2022 Jun 14;79(23):2333-2348. doi: 10.1016/j.jacc.2022.03.380. PMID: 35680185.

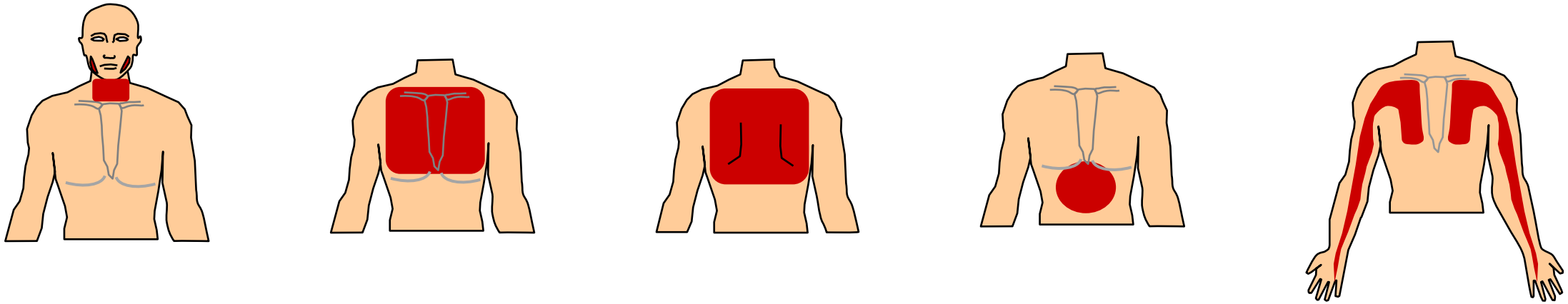
Il dolore toracico in DEA: eterogeneità clinica

subacuto
lieve
paziente stabile

acutissimo
severo
paziente instabile



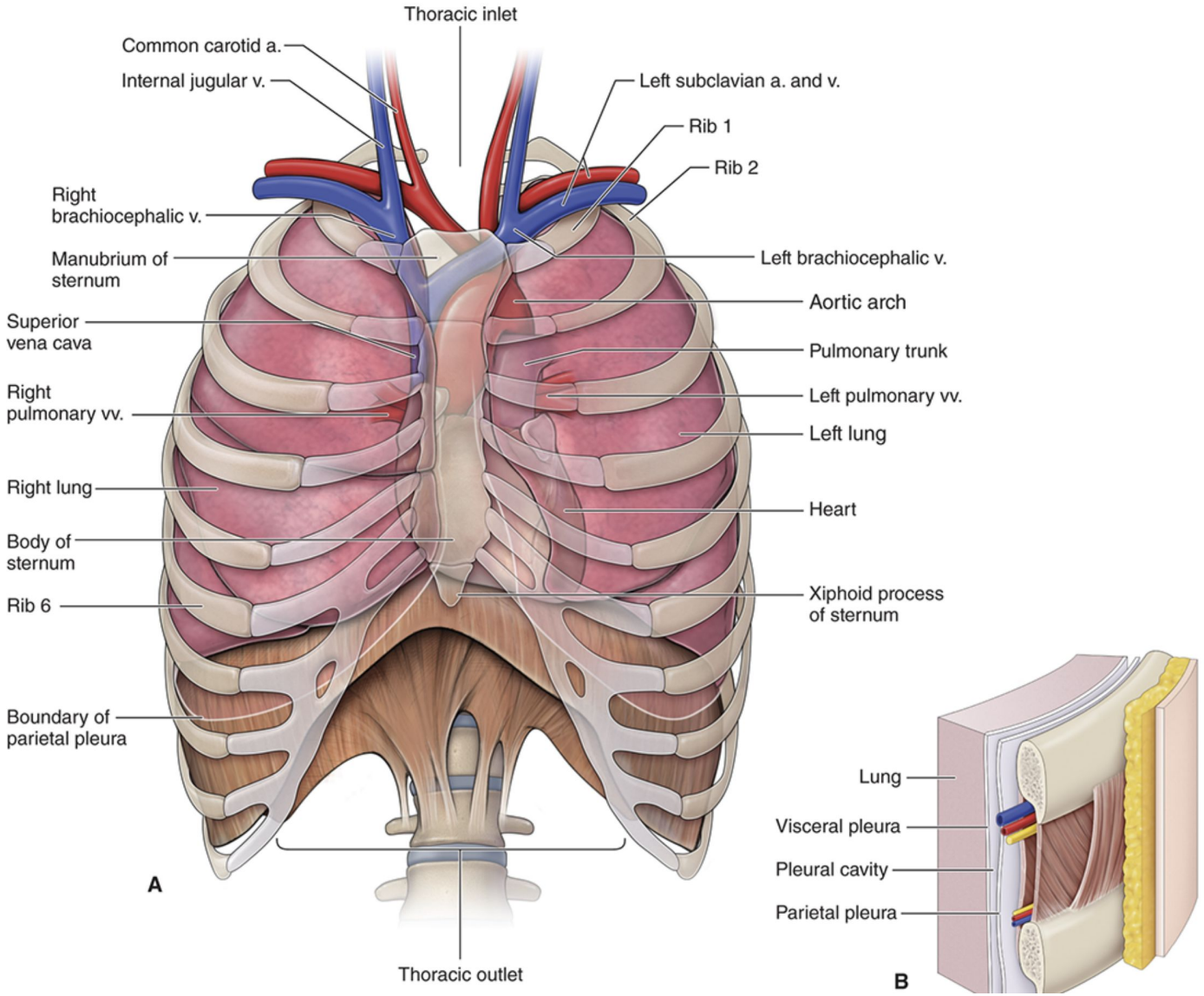
Il dolore toracico in DEA: eterogeneità clinica



Durante l'avvio della valutazione clinica (es. triage), il dolore toracico è una variabile proxy impiegata in presenza di qualsiasi dolore localizzato:

- **anteriormente**, tra la base del naso e la linea ombelicale trasversa
- **lateralmente**, tra l'ascella e l'ultima costa
- **posteriormente**, tra la nuca e la 12ª vertebra toracica

Il dolore toracico in DEA: cause



CUTE
- Infezioni
- Raccolte
- Neoplasie

MAMMELLA
- Ingorgo
- Mastite
- Neoplasie

MUSCOLI
COSTE
STERNO
VERTEBRE
- Fratture
- Lesioni muscolari
- Ematomi, raccolte
- Neoplasie

NERVI
- Radiculopatie
- Nevriti (es. herpes zoster)

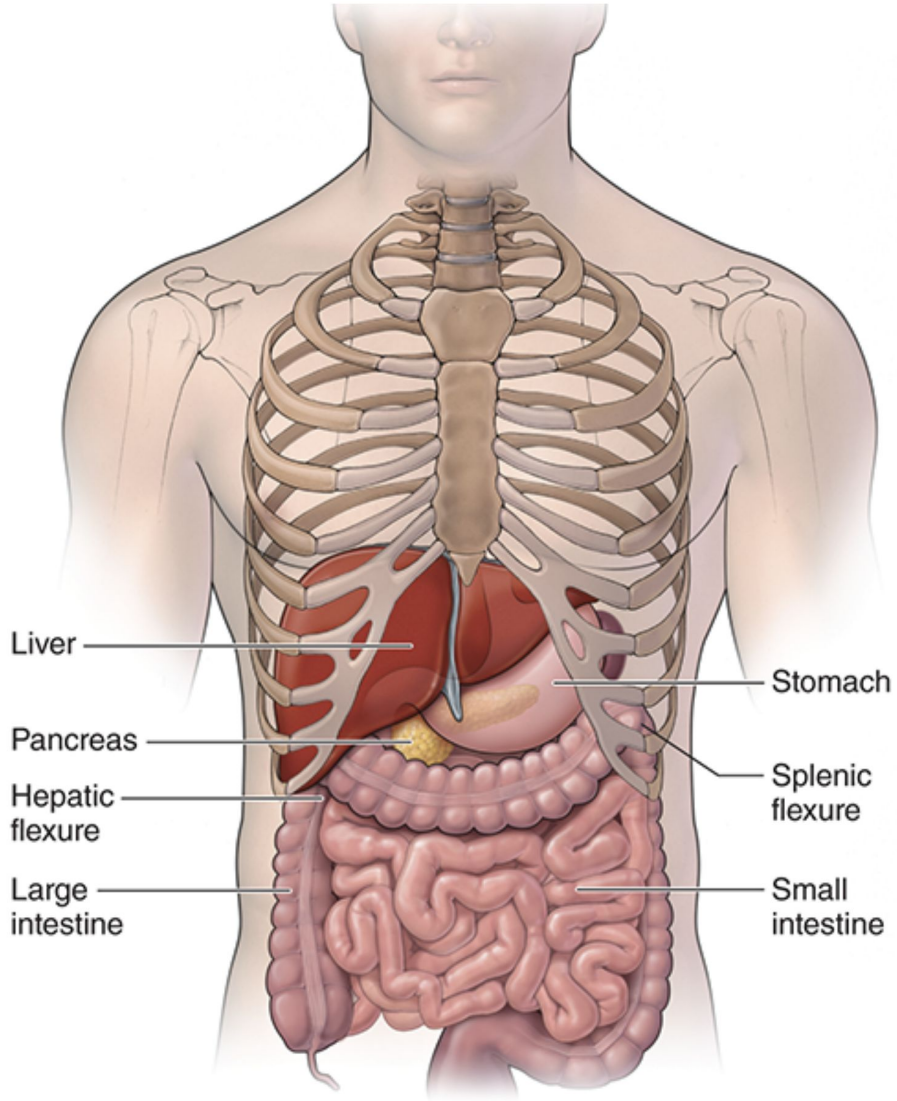
CUORE
- Cardiopatia ischemica
- Pericardite
- Versamenti pericardici
- Neoplasie

PLEURA
POLMONE
- Polmonite
- Pleurite
- Versamenti pleurici
- Pneumotorace
- Contusione polmonare
- Neoplasie

MEDIASTINO
- Patologia esofagea
- Mediastinite
- Neoplasie

GRANDI VASI
- Sindromi aortiche acute
- Trombosi cavale
- Embolia polmonare

Il dolore toracico in DEA: cause



APPARATO DIGERENTE

- Ernia iatale, reflusso gastroesofageo
- Esofagite
- Spasmo esofageo
- Perforazione, rottura esofagea
- Gastrite, ulcera peptica
- Corpi estranei
- Colelitiasi, colecistite
- Pancreatite
- Neoplasie

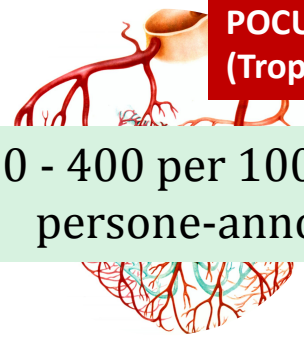
ORGANI IPOCONDRIACI

- Infarto splenico
- Lesione, rottura splenica
- Congestione epatica
- Neoplasie

APPARATO URINARIO

- Colica renale
- Infezioni urinarie alte
- Infarto renale
- Neoplasie renali

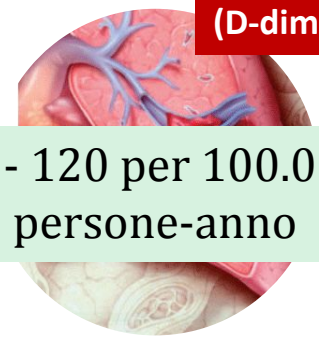
Il dolore toracico in DEA: cause non traumatiche tempo-dipendenti



ECG
POCUS
(Troponina)

100 - 400 per 100.000 persone-anno

sindromi coronariche acute



POCUS
(D-dimero)

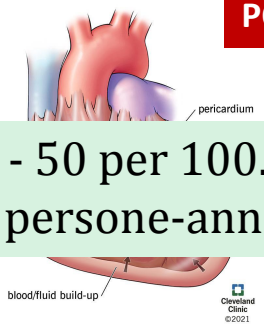
70 - 120 per 100.000 persone-anno

embolia polmonare

ECG

30 - 100 per 100.000 persone-anno

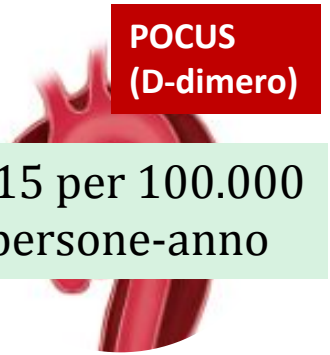
aritmie



POCUS

20 - 50 per 100.000 persone-anno

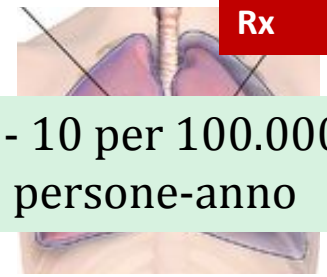
tamponamento cardiaco



POCUS
(D-dimero)

5-15 per 100.000 persone-anno

sindromi aortiche acute



POCUS
Rx

1 - 10 per 100.000 persone-anno

PNX iperteso

3 per 100.000 persone-anno

perforazione esofagea

Il dolore toracico in DEA: studio osservazionale prospettico – *dati preliminari Morello et al.*

Popolazione

Pazienti adulti consecutivi con dolore toracico acuto non traumatico, 24h/7d

- ✗ Età <18 anni
- ✗ Trauma
- ✗ IRC in dialisi
- ✗ Arresto cardiaco o shock prima dell'arrivo in DEA
- ✗ Rifiuto di partecipazione al follow-up

Setting

DEA III livello
Ospedale Molinette
AOU Città della Salute e della Scienza di Torino

Periodo di arruolamento

1/12/2021 - 30/06/2023
(escluso 12/2022)

- Variabili demografiche
- Dati anamnestici
- ECG
- Esami ematochimici (hs-TnI Abbott Architect®; cut-off F <16 ng/L, M <34 ng/L)
- Outcome: follow-up (telefonico, clinico) a 30 giorni

Il dolore toracico in DEA: studio osservazionale prospettico – *dati preliminari Morello et al.*

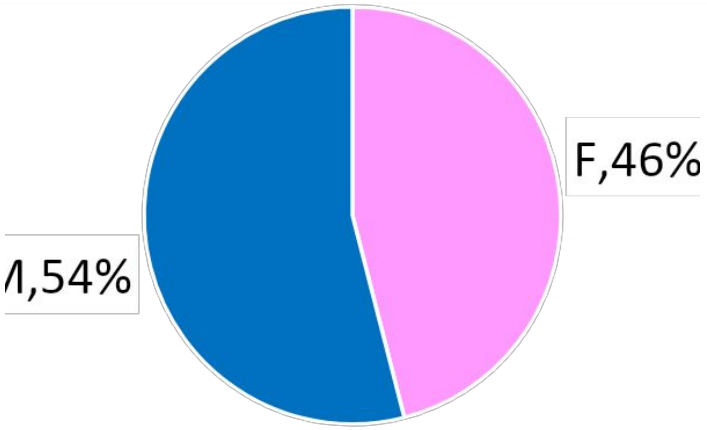
6% dei pazienti DEA nel periodo indice

Pazienti arruolabili
n = 5,675

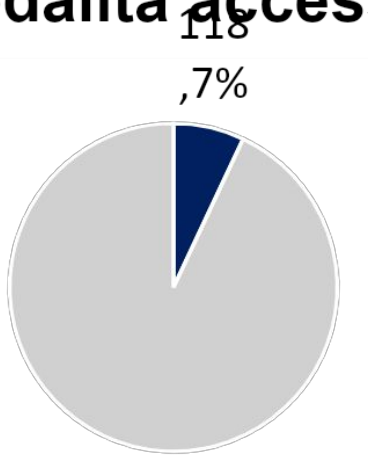
Pazienti analizzati
n = 3,901

prevalentemente gestiti con algoritmo ESC tropo 0/3h

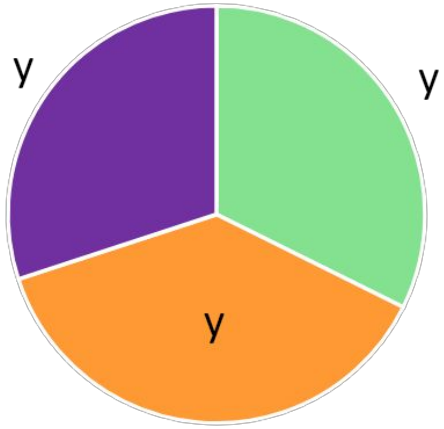
genere



modalità accesso

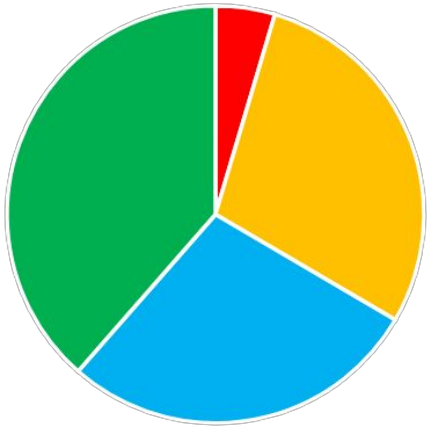


età



59 (45-73) anni

codice triage



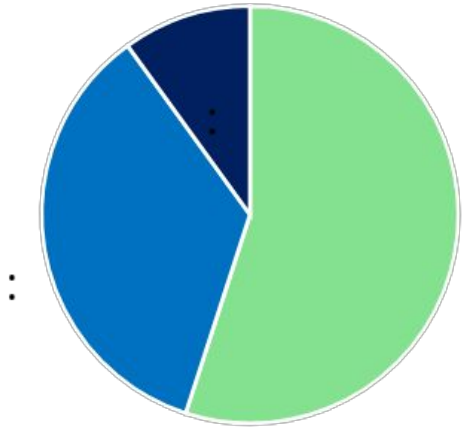
Il dolore toracico in DEA: studio osservazionale prospettico – *dati preliminari Morello et al.*

tempo di insorgenza

12 (4-72) ore

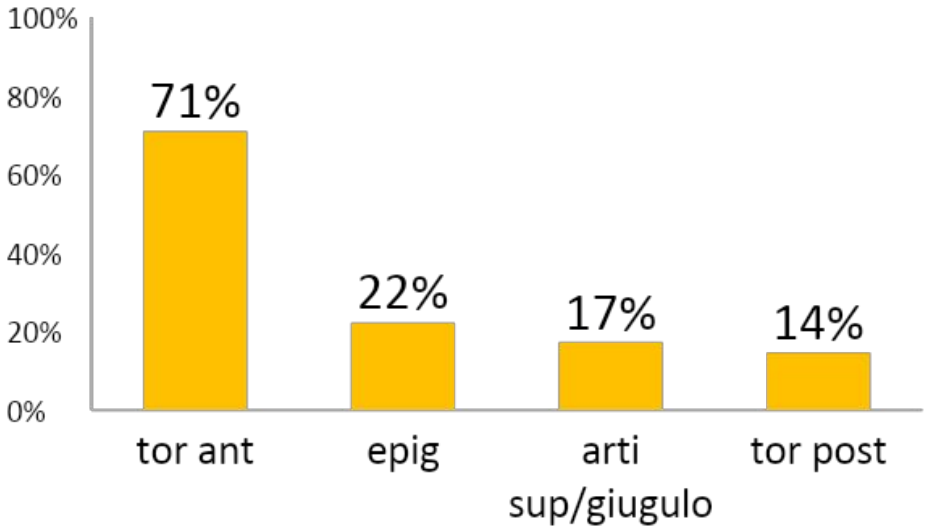
25% <4 ore
(N.B. soglia temp. troponina-hs: 3 ore)

altri sintomi associati

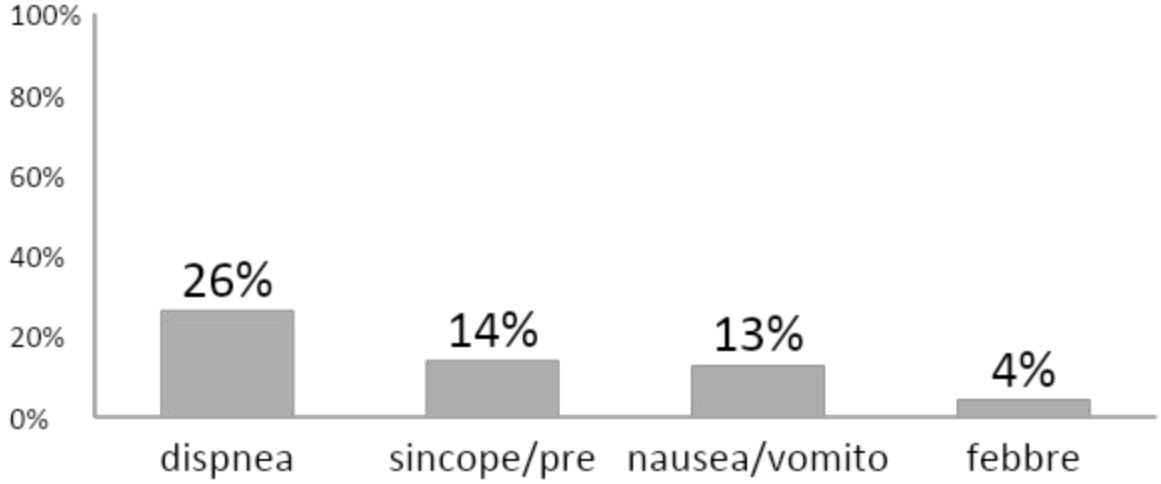


: nessuno:

sede del dolore



altri sintomi associati



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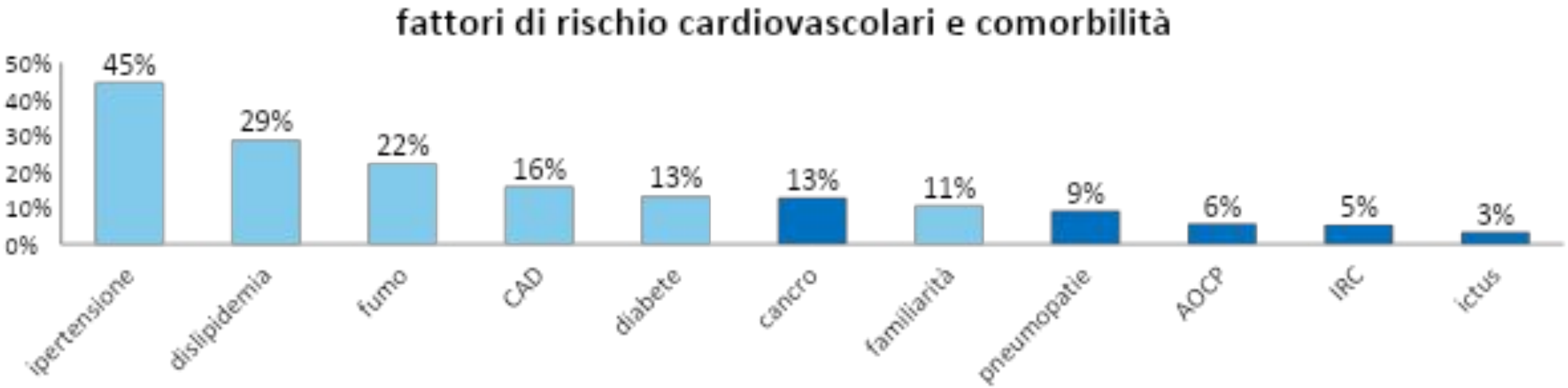

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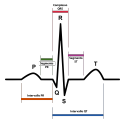
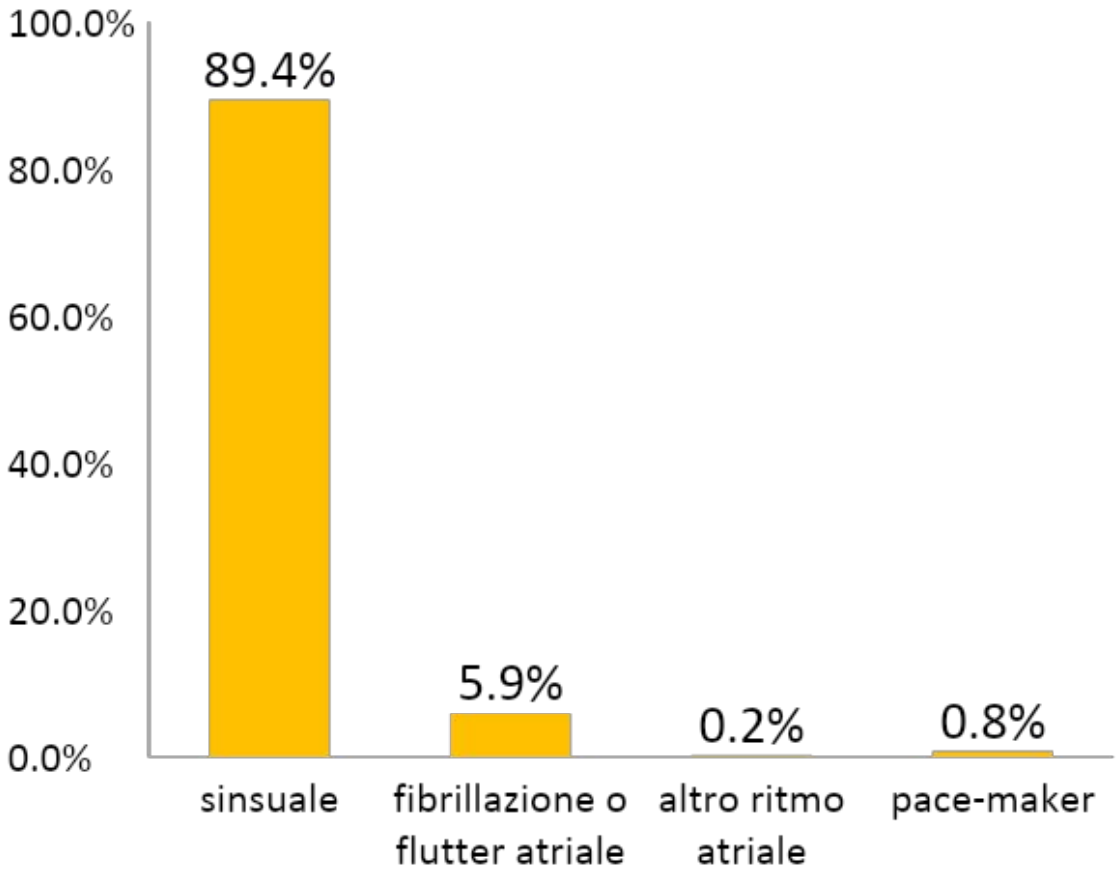
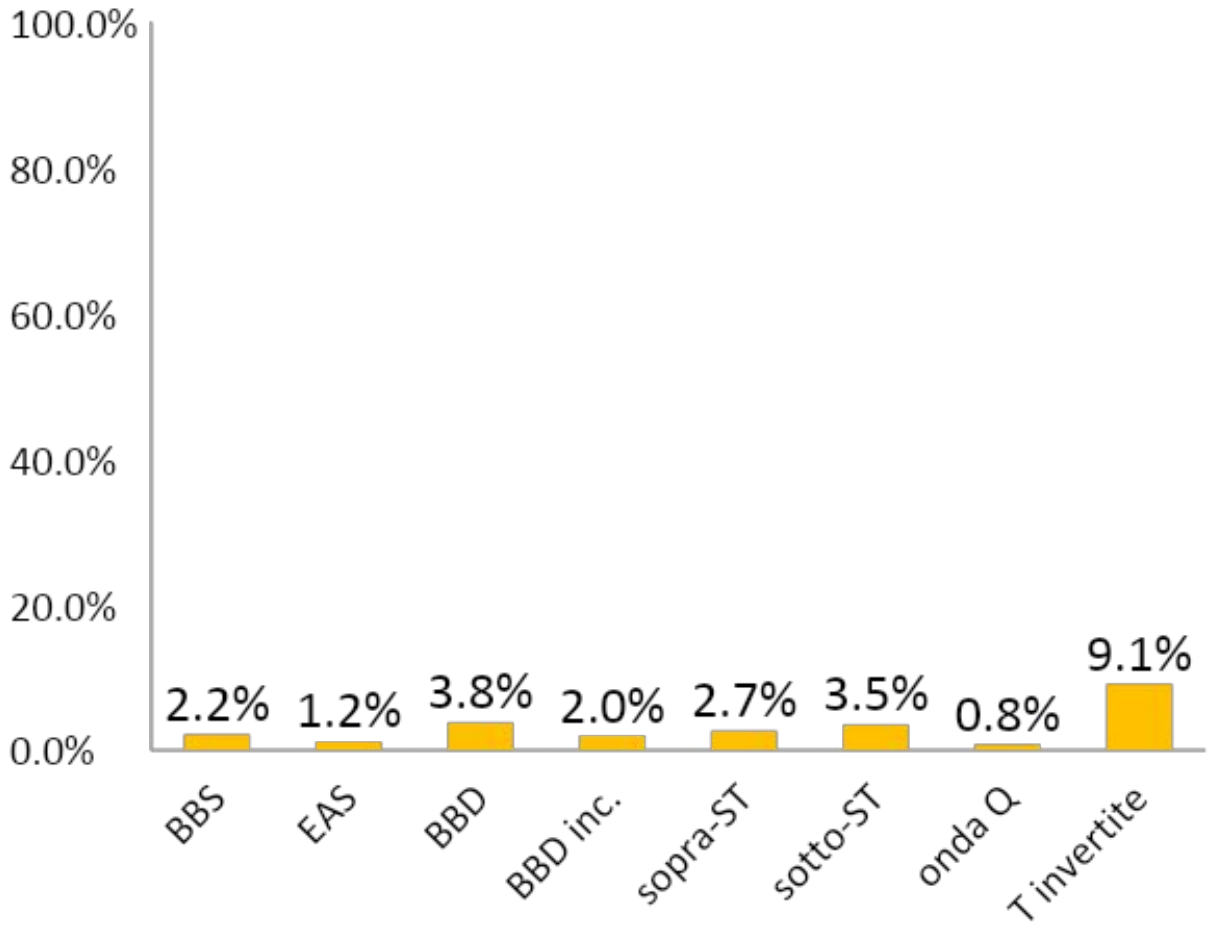


dati ECG

ritmo



segni ischemici



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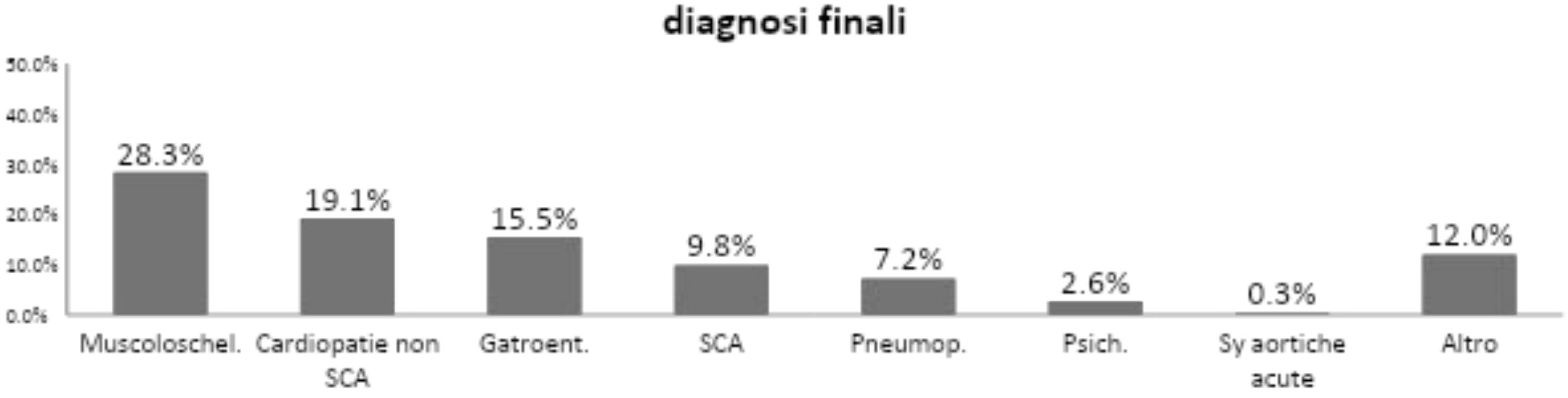

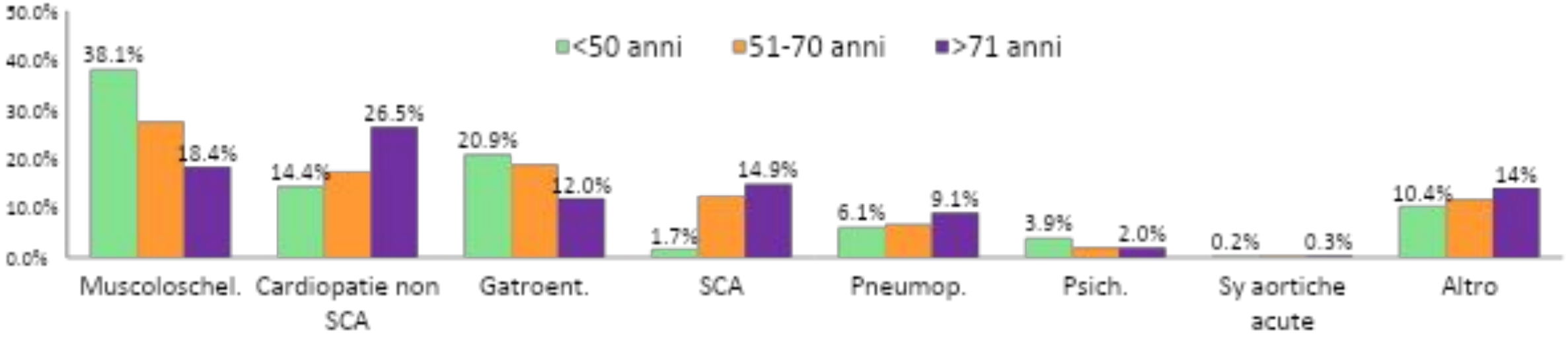

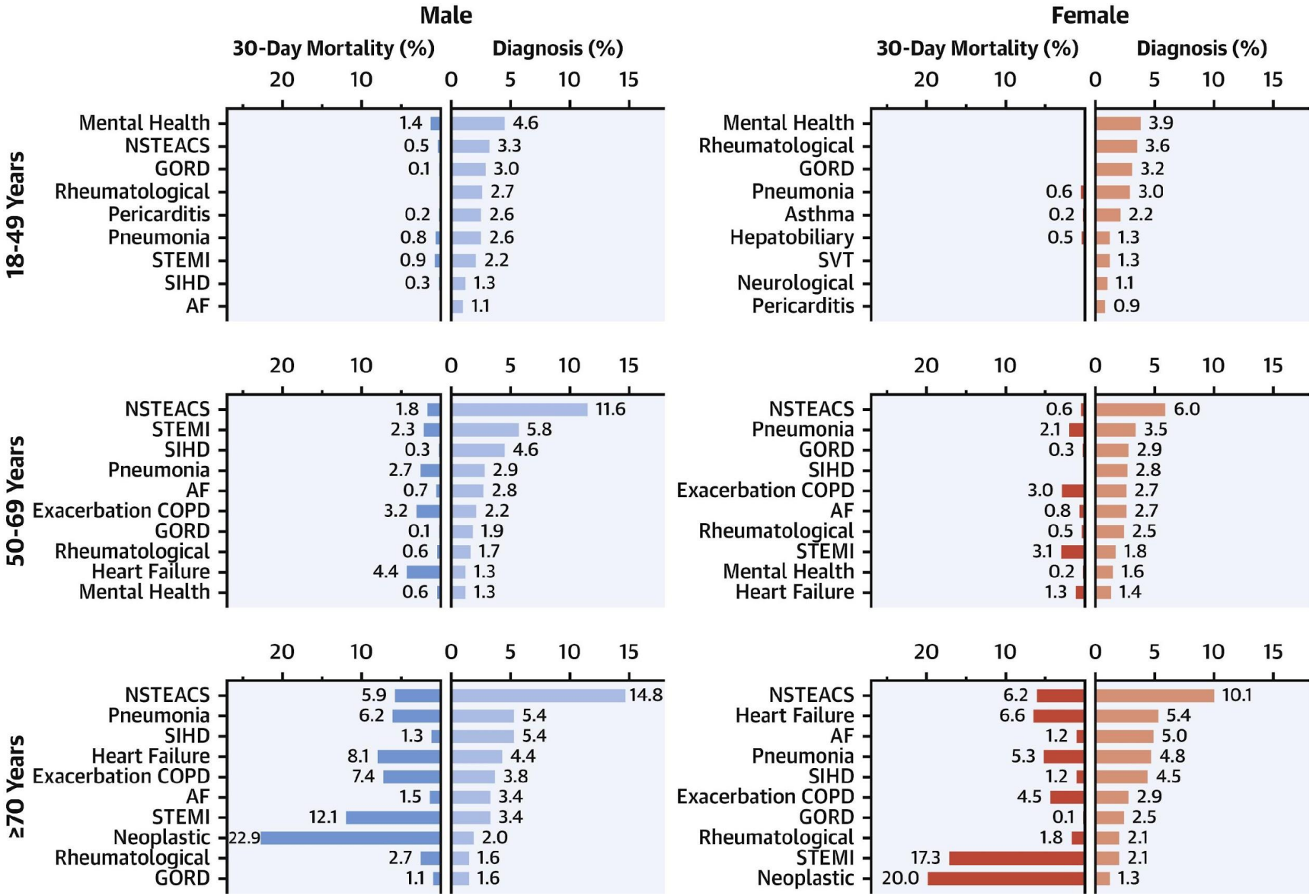

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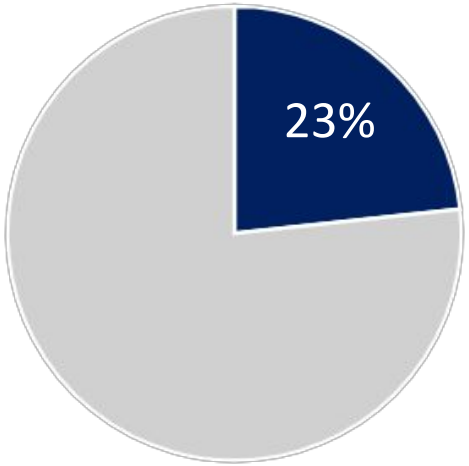
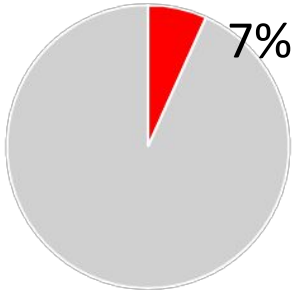
Il dolore toracico in DEA: studio osservazionale prospettico – *dati preliminari Morello et al.*

Tasso di ricovero ospedaliero

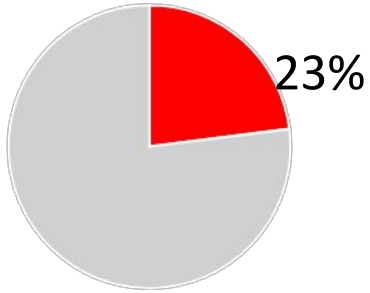


<50 anni



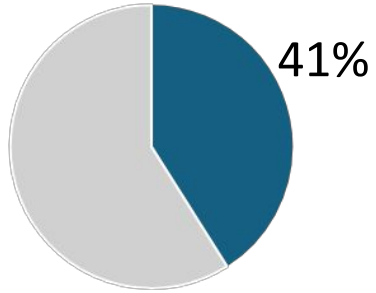
mortalità 30d: 0.1%

50-70 anni



mortalità 30d: 0.4%

>70 anni

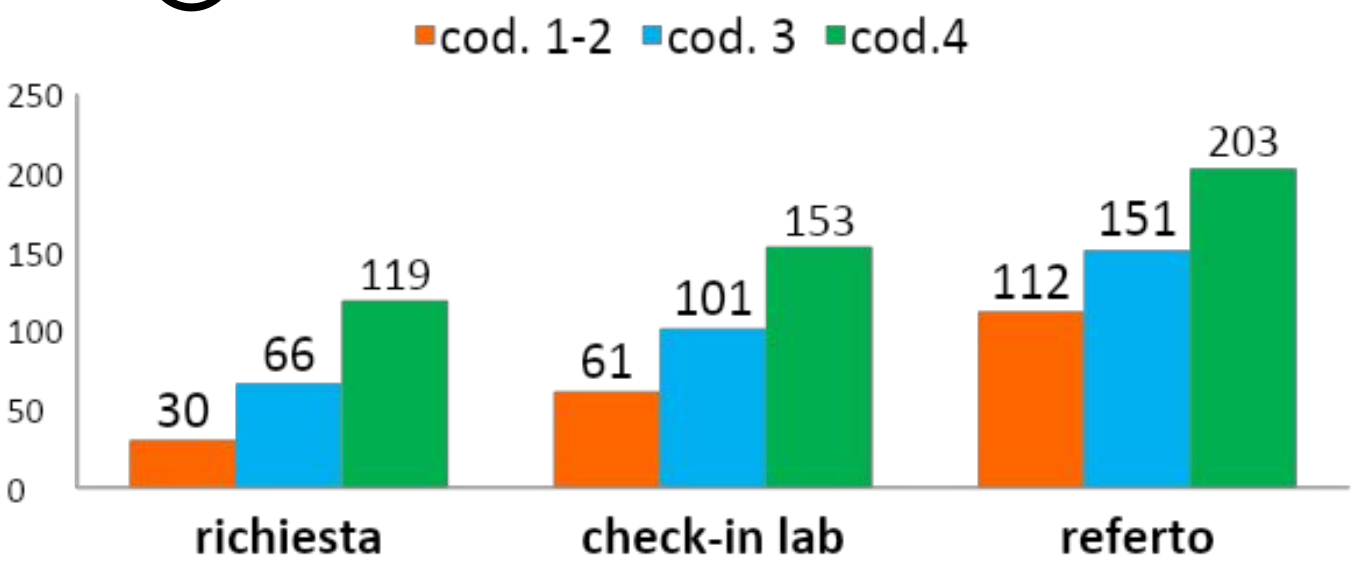


mortalità 30d: 1%

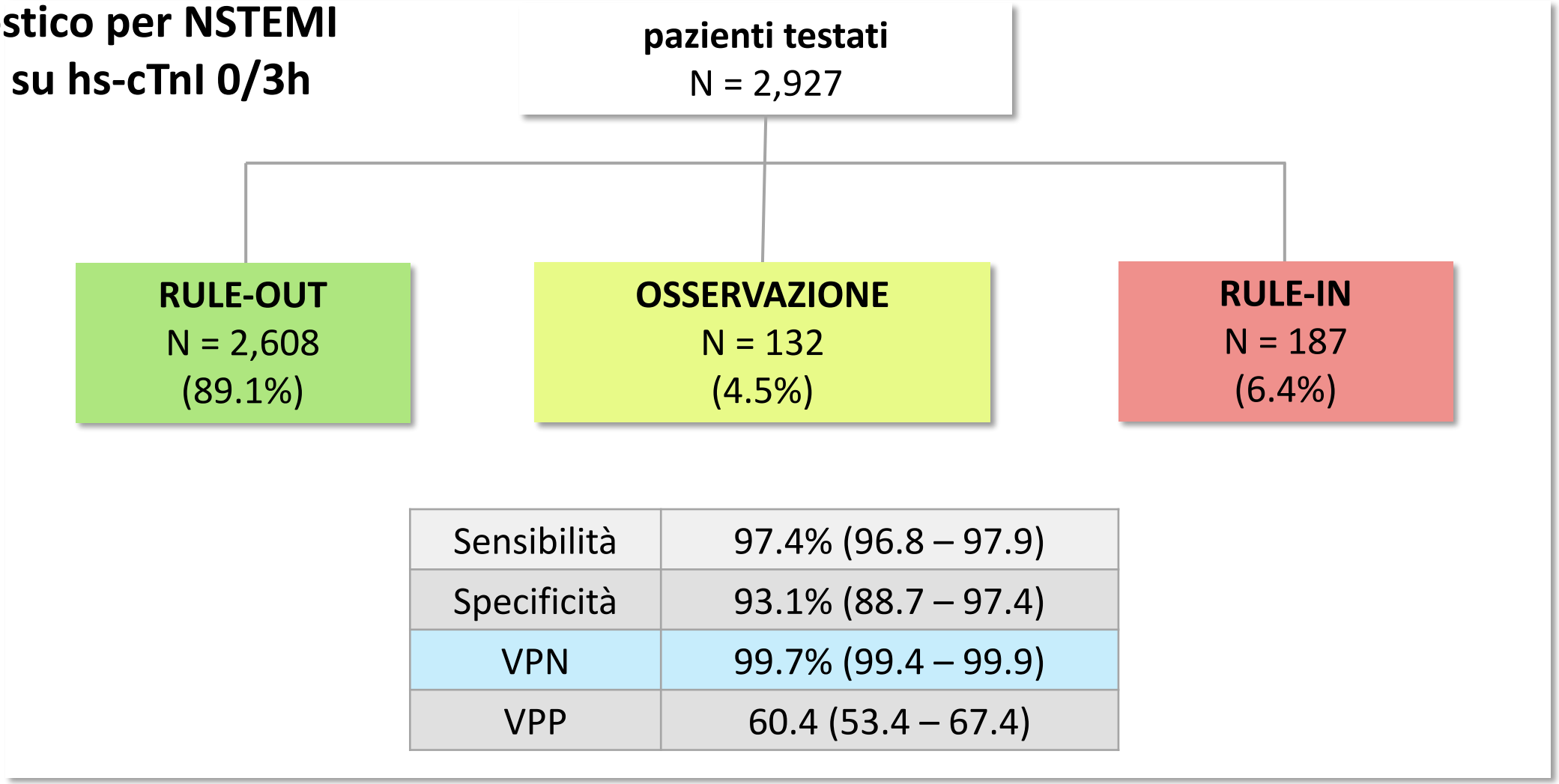
Il dolore toracico in DEA: studio osservazionale prospettico – *dati preliminari Morello et al.*

Pazienti sottoposti a dosaggio troponina (I-hs): 1^ determinazione

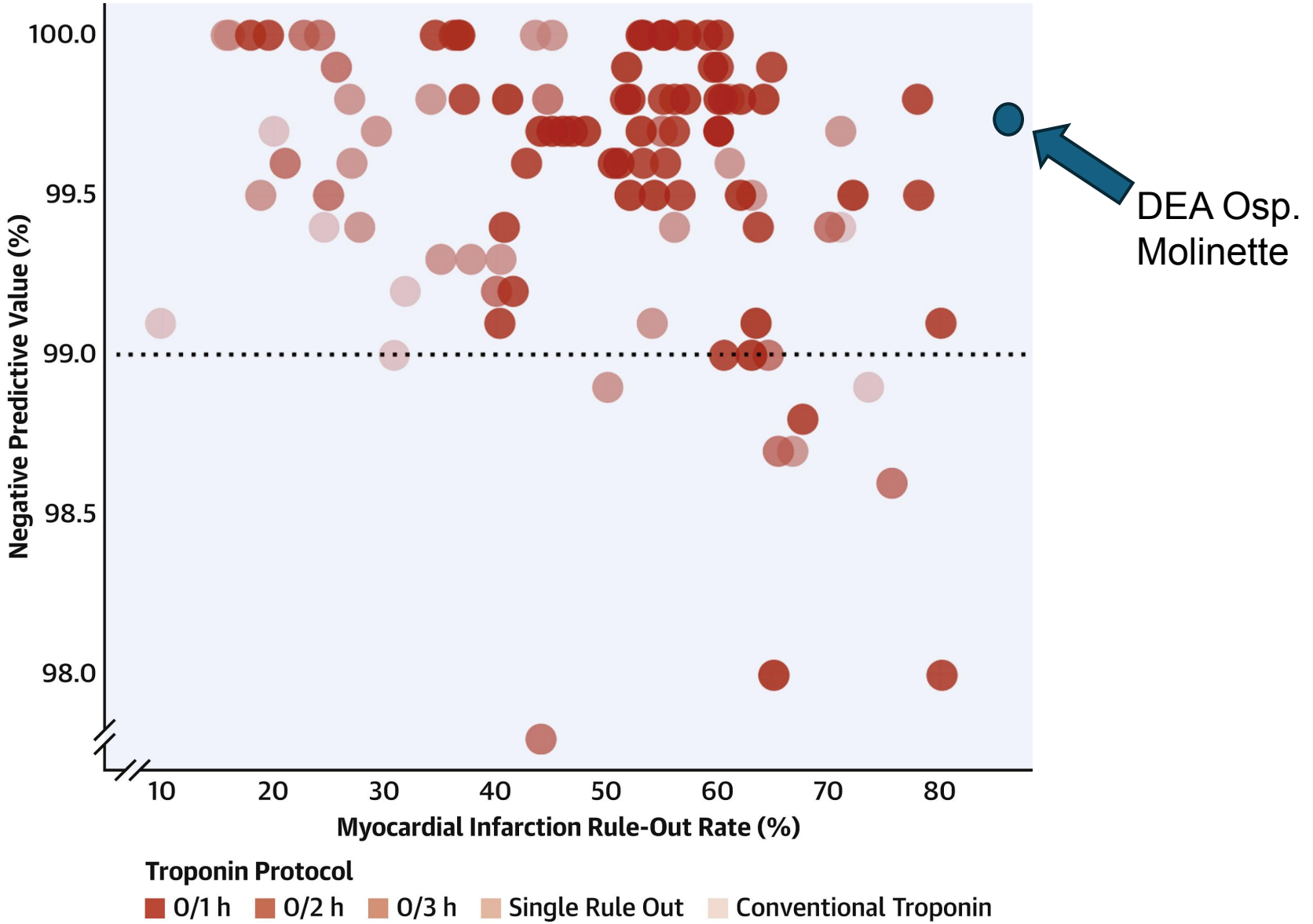
minuti da triage a 1^ troponina



Performance dell'algoritmo diagnostico per NSTEMI basato su hs-cTnI 0/3h



Sensibilità	97.4% (96.8 – 97.9)
Specificità	93.1% (88.7 – 97.4)
VPN	99.7% (99.4 – 99.9)
VPP	60.4 (53.4 – 67.4)



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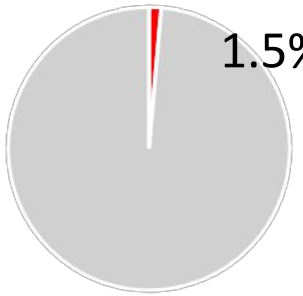
Il dolore toracico in DEA: studio osservazionale prospettico – *dati preliminari Morello et al.*

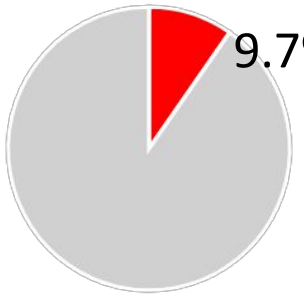
troponina (I-hs): 1^ determinazione

<50 anni



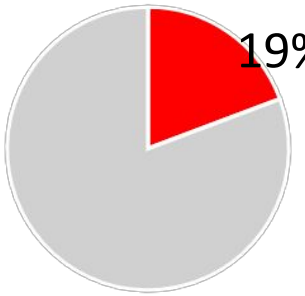
>99° perc.

50-70 anni



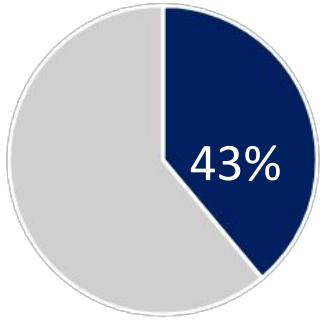
>99°perc.

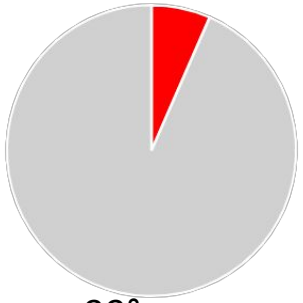
>70 anni



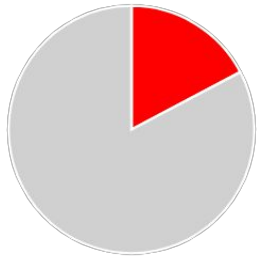
>99° perc.

troponina (I-hs): 2^ determinazione



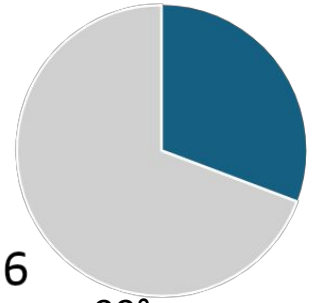


>99° perc.



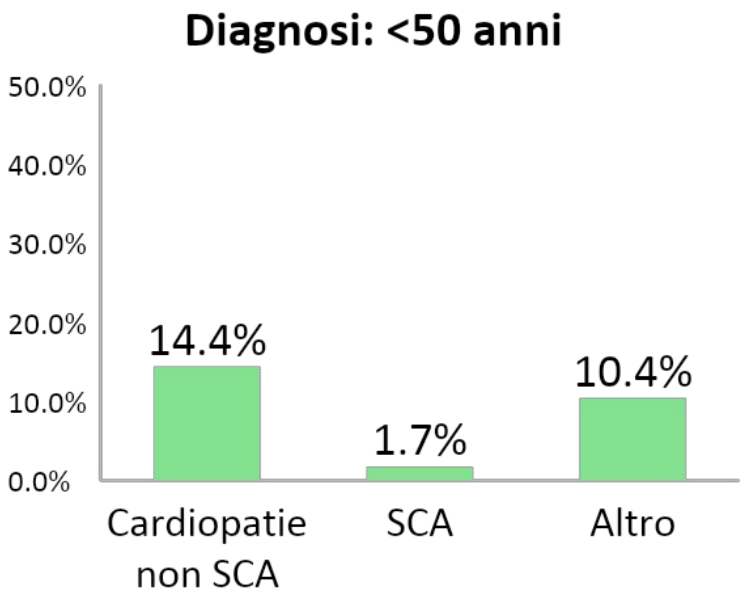
>99°perc.

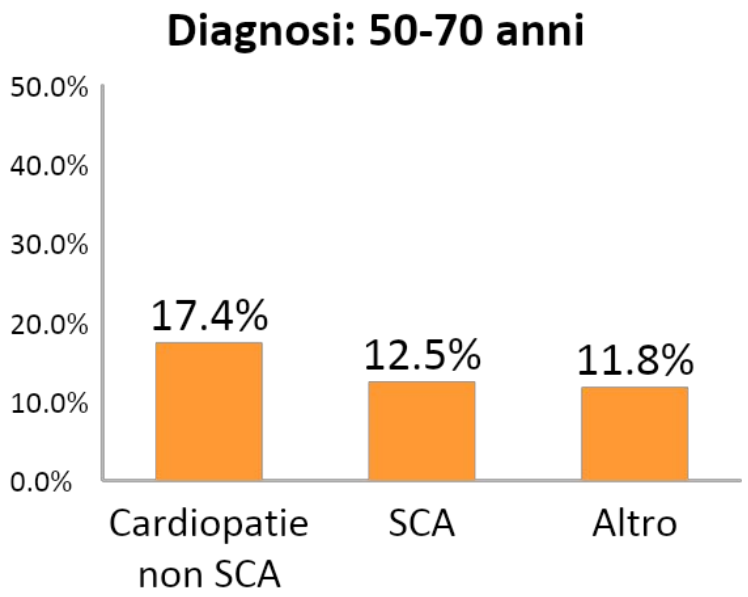
neg,6

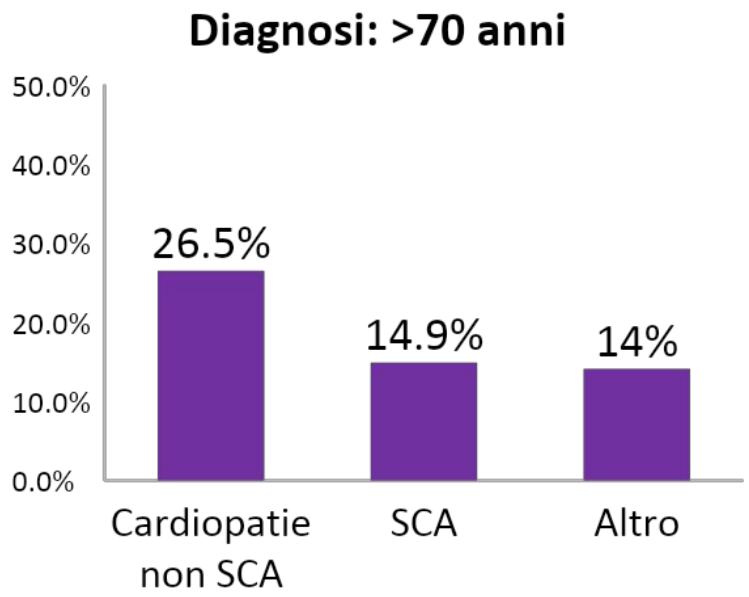


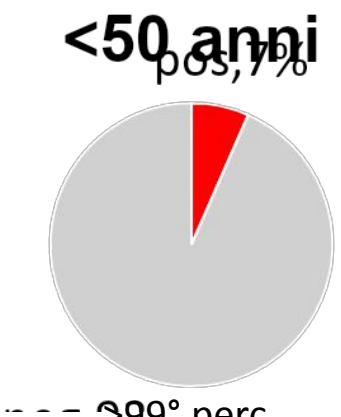
>99° perc.

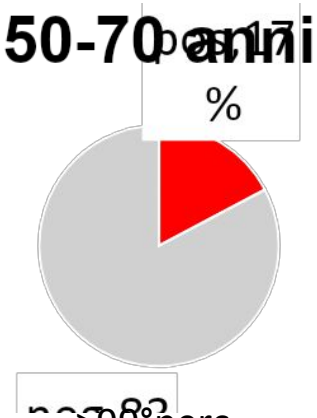
Troponina I-hs

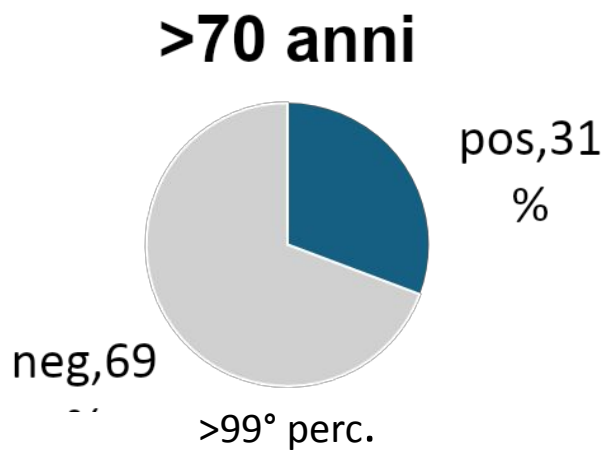






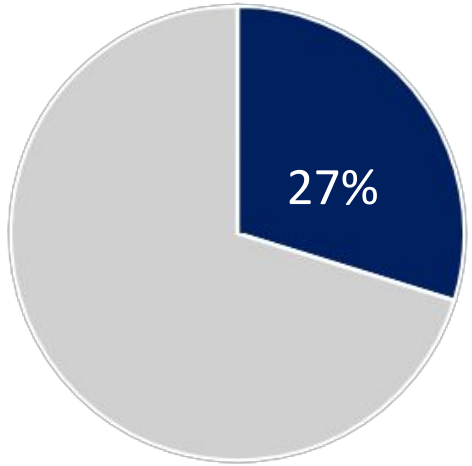




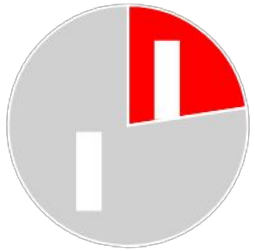


Il dolore toracico in DEA: studio osservazionale prospettico – *dati preliminari Morello et al.*

Pazienti sottoposti a dosaggio D-dimero

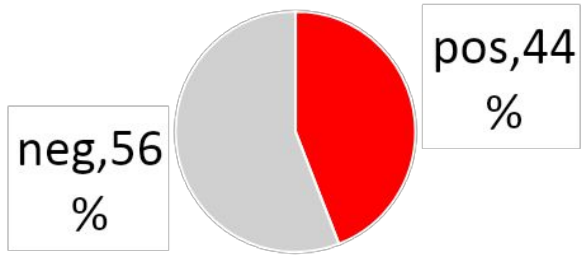


<50 anni



>500 ng/mL

50-70 anni



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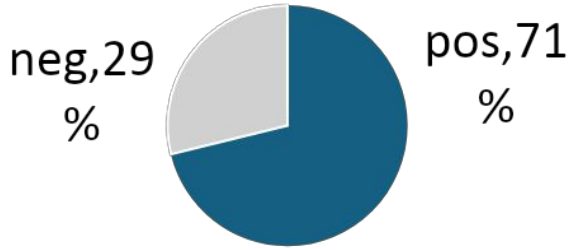
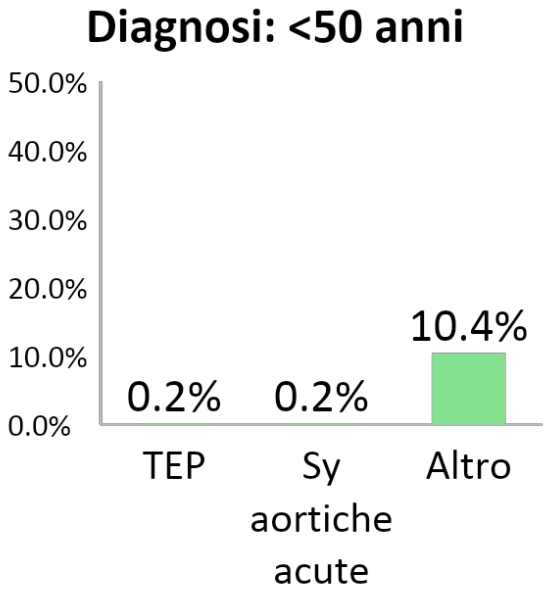
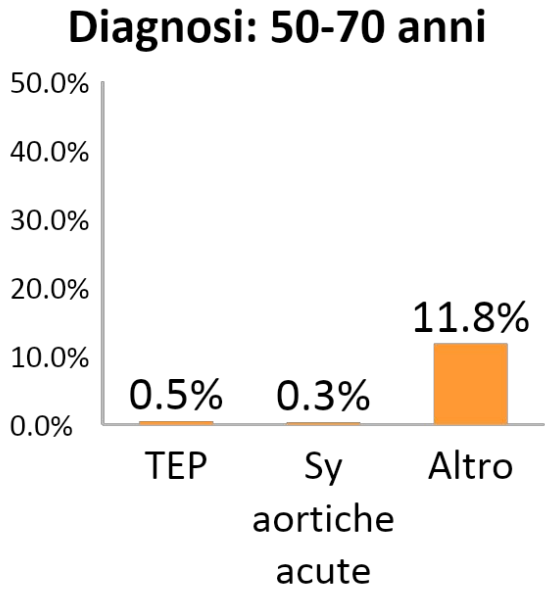
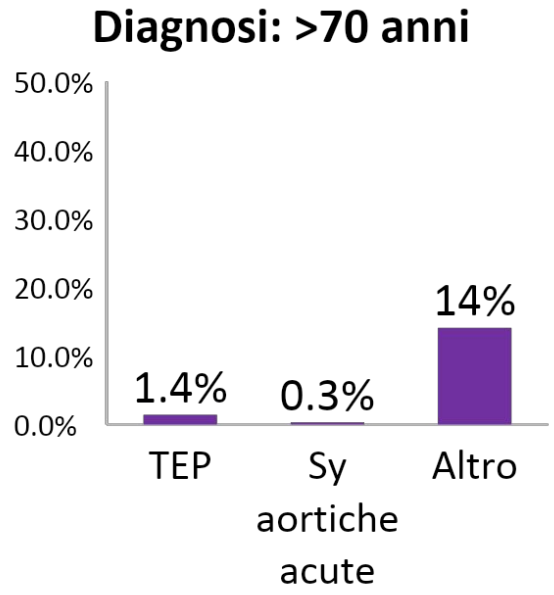


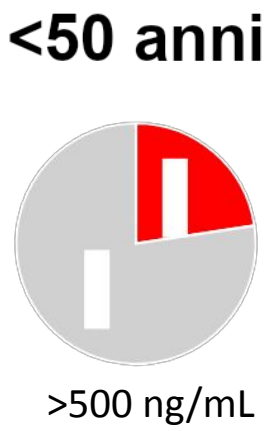
>500 ng/mL

D-dimero









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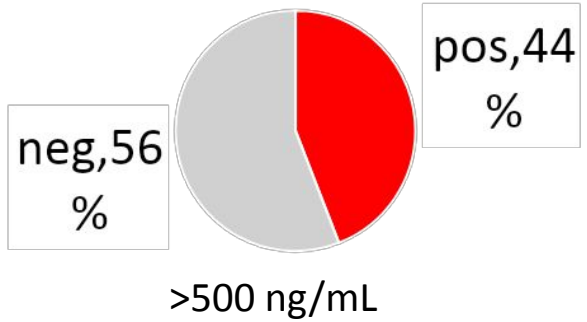

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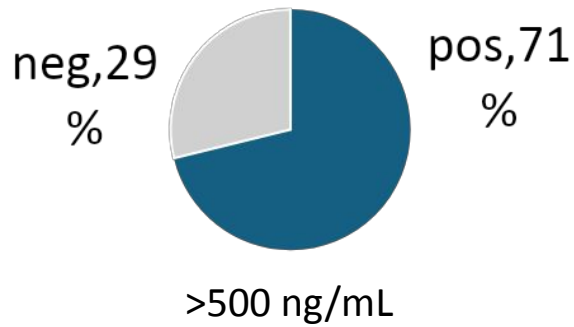
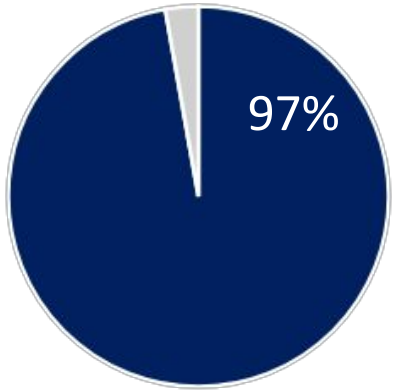
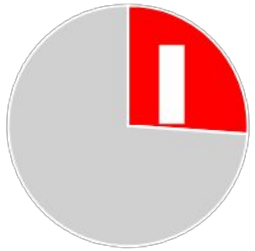


>500 ng/mL

Pazienti sottoposti a dosaggio PCR (proteina C reattiva)

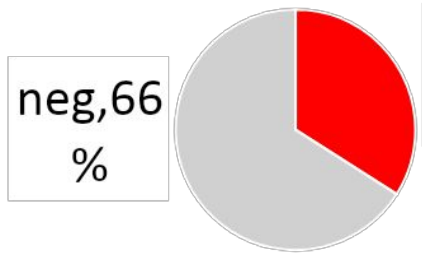


<50 anni



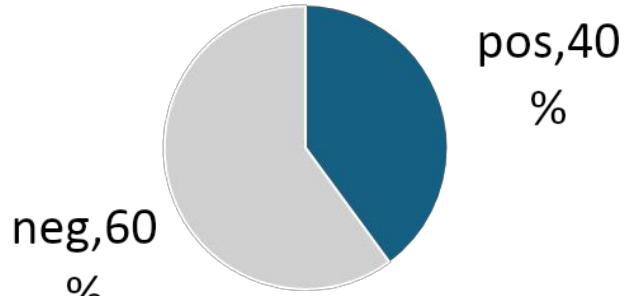
>5 mg/L

50-70 anni



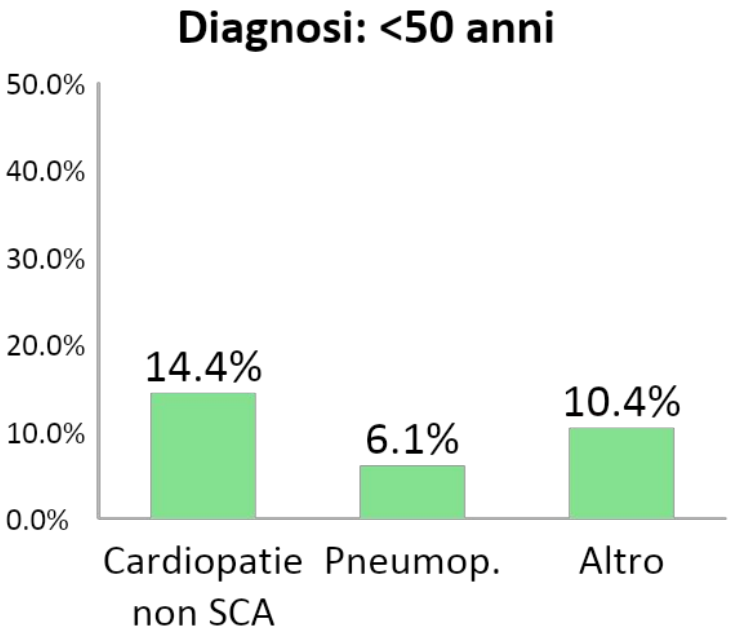
>5 mg/L

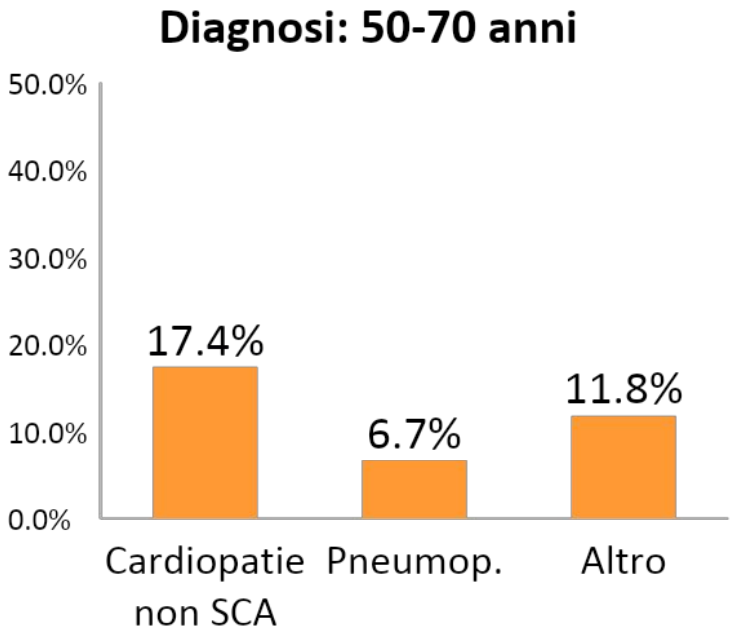
>70 anni

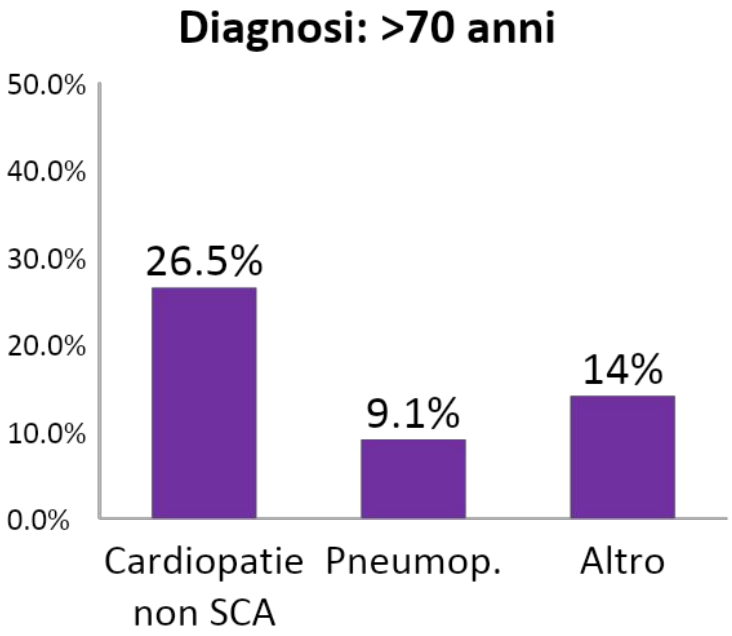


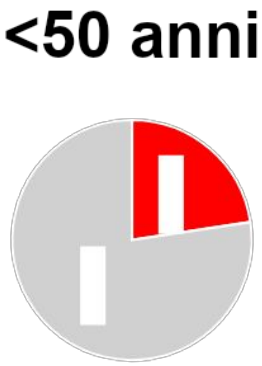
>5 mg/L

PCR



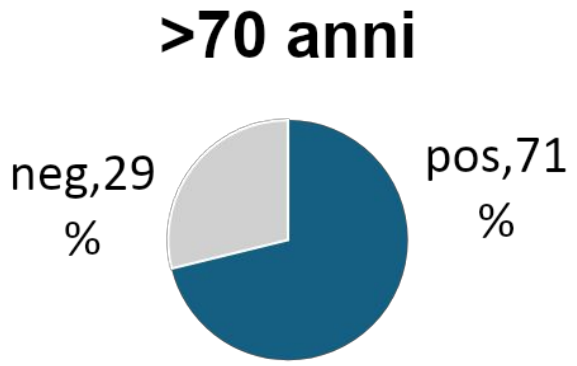






>5 mg/L

>5 mg/L



>5 mg/L

Il dolore toracico in DEA: studio osservazionale prospettico – *dati preliminari Morello et al.*

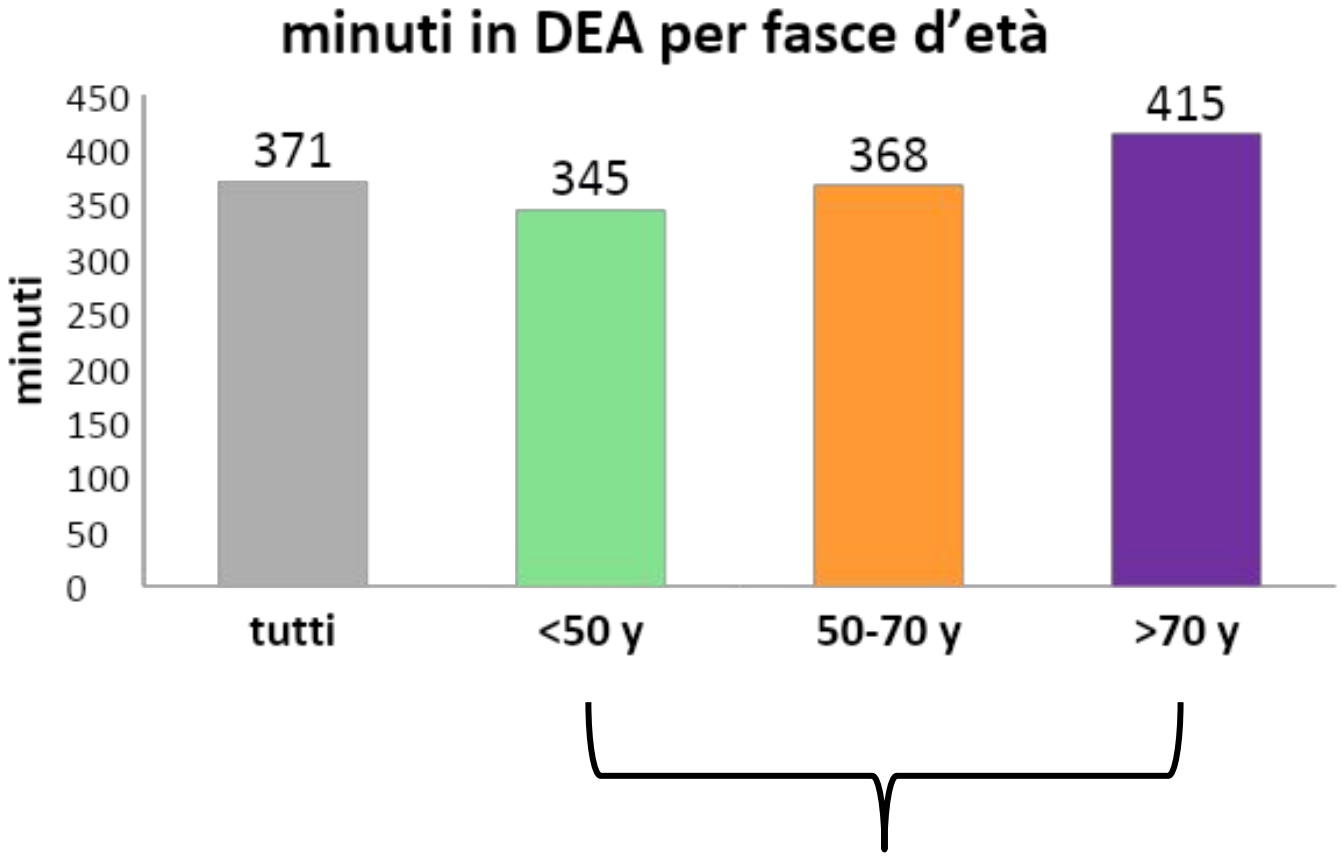
tempo di permanenza in DEA

(pazienti non ospedalizzati)

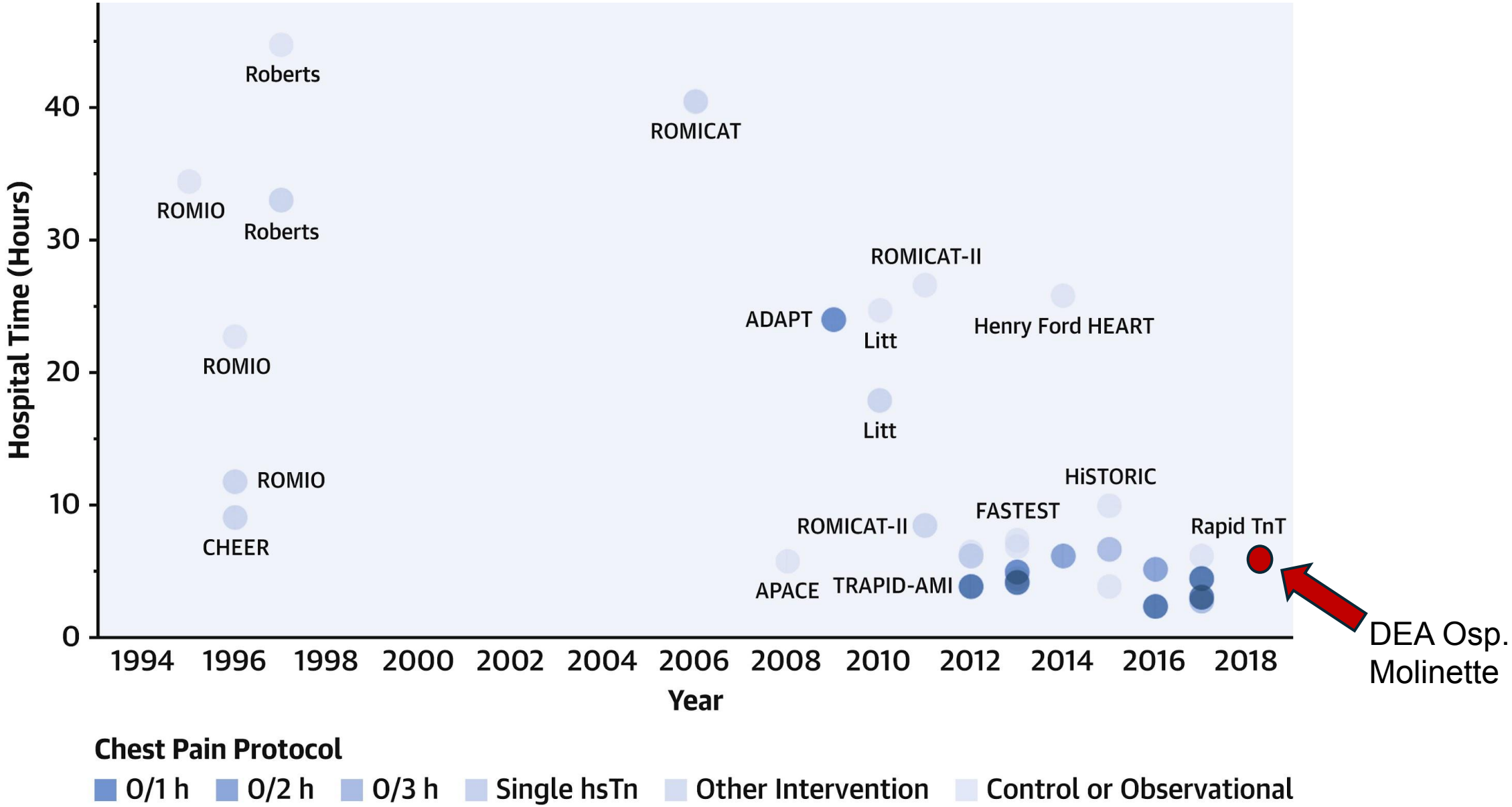
06:11

(04:21-08:44)

hh:mm

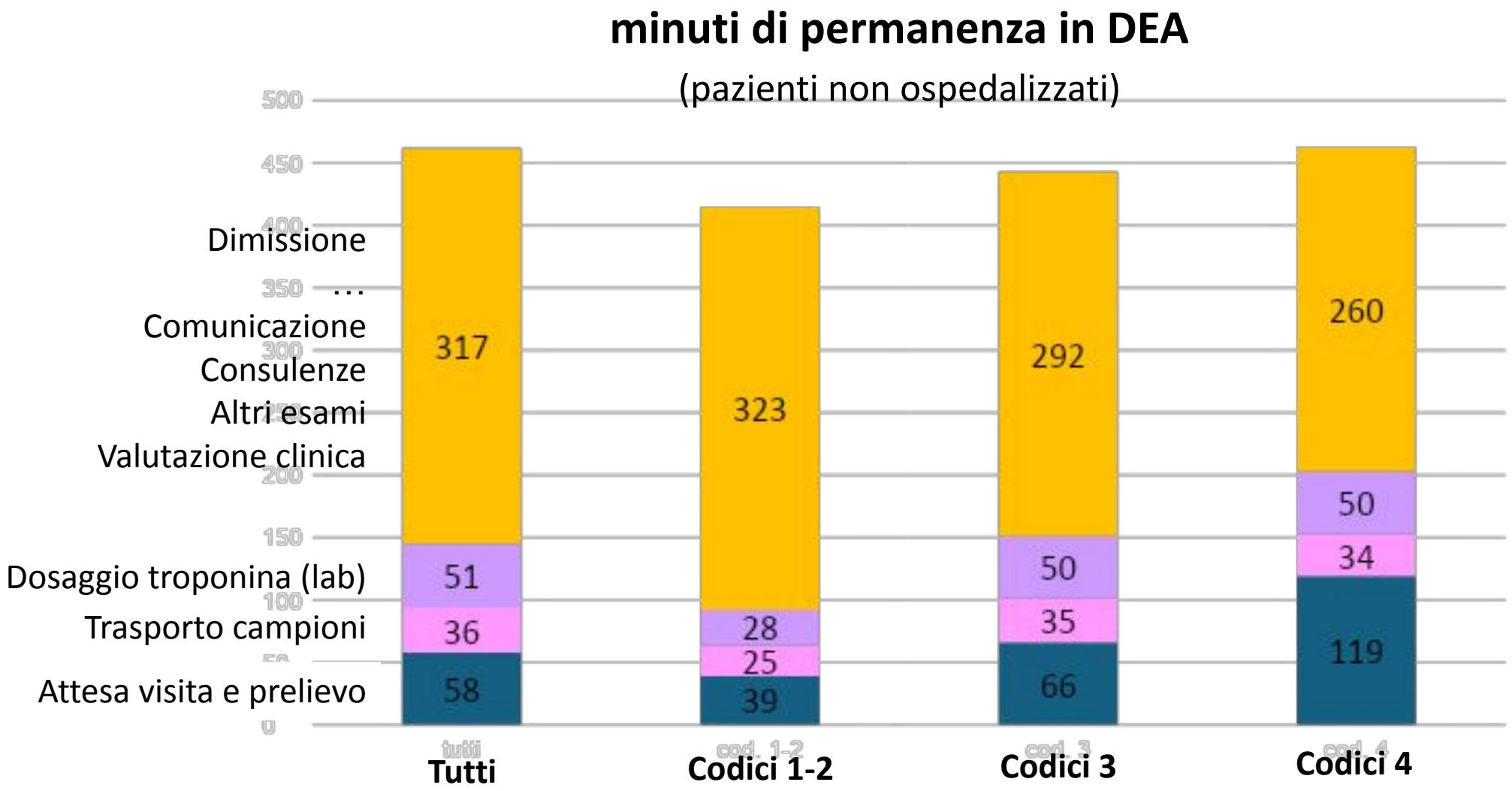


70 min. di differenza nei tempi di gestione in DEA fra pazienti con età >70 *vs* <50 anni

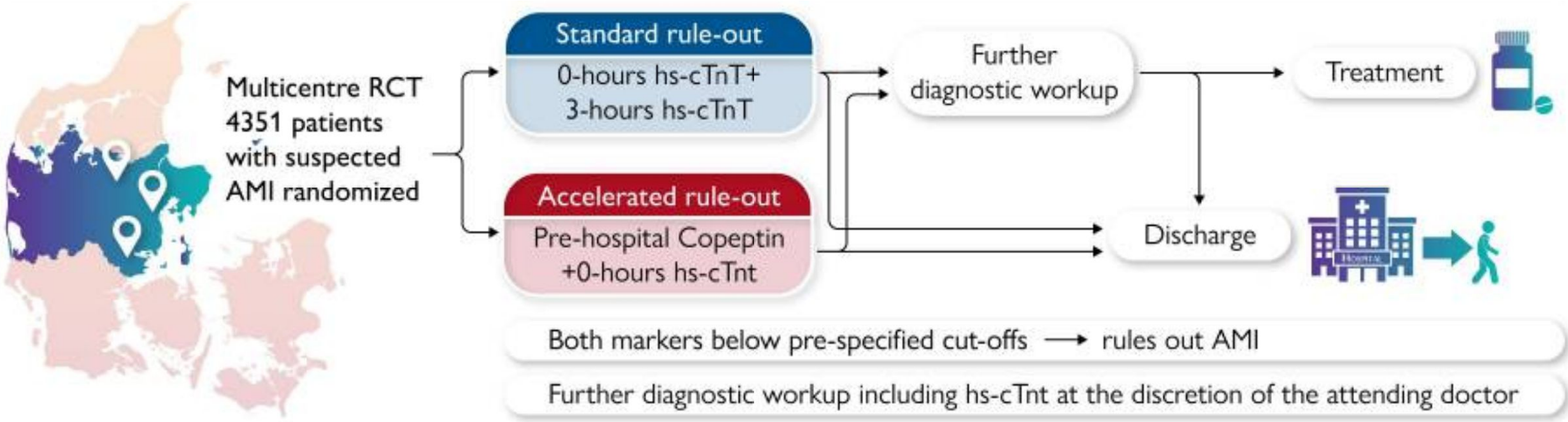


Dawson LP et al. Care Models for Acute Chest Pain That Improve Outcomes and Efficiency: JACC State-of-the-Art Review. J Am Coll Cardiol. 2022 Jun 14;79(23):2333-2348. doi: 10.1016/j.jacc.2022.03.380. PMID: 35680185.

Il dolore toracico in DEA: studio osservazionale prospettico – *dati preliminari Morello et al.*

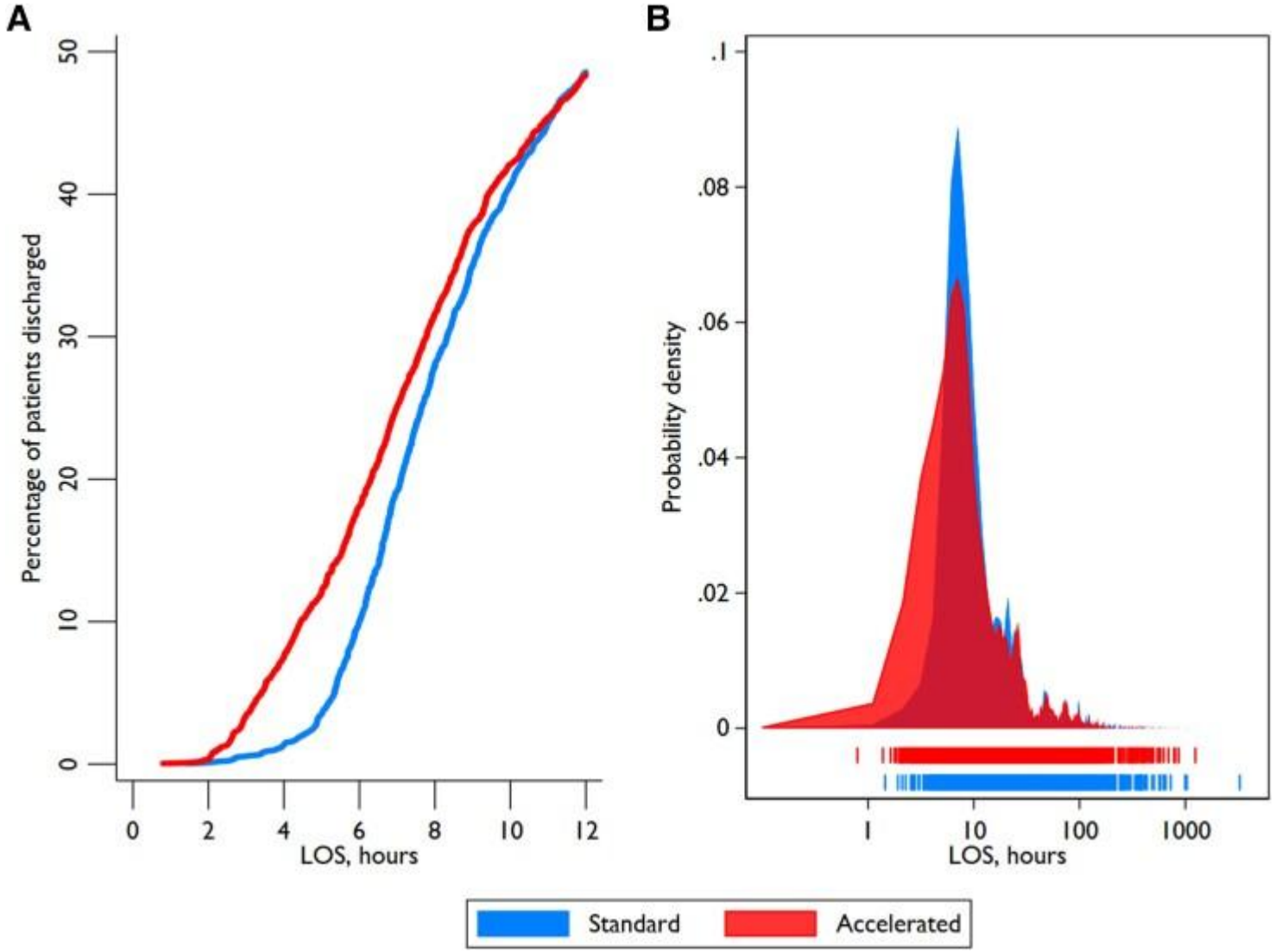


Il dolore toracico in DEA: avvio dosaggio biomarcatori in fase preospedaliera



Pedersen CK et al. Accelerated -Rule-Out of acute Myocardial Infarction using prehospital copeptin and in-hospital troponin: The AROMI study. Eur Heart J. 2023 Oct 12;44(38):3875-3888. doi: 10.1093/eurheartj/ehad447. PMID: 37477353; PMCID: PMC10568000.

Il dolore toracico in DEA: avvio dosaggio biomarcatori in fase preospedaliera



Pedersen CK et al. Accelerated -Rule-Out of acute Myocardial Infarction using prehospital copeptin and in-hospital troponin: The AROMI study. Eur Heart J. 2023 Oct 12;44(38):3875-3888. doi: 10.1093/eurheartj/ehad447. PMID: 37477353; PMCID: PMC10568000.

Length of hospital stay in patients discharged after early rule-out (within 12 h)

	Total	Accelerated	Standard	Difference	*P*-value
Discharged within 12 h, *n* (%)	2057 (47.3%)	1029 (47.2%)	1028 (47.3%)	4 (0.1%)	
LOS overall, hours, mean (95% CI)	7.3 (7.2–7.4)	6.9 (6.7–7.1)	7.8 (7.6–7.9)	0.9 (0.7–1.1)	<.001
LOS site 1, hours, mean (95% CI)	7.1 (6.9–7.3)	6.7 (6.4–7.0)	7.5 (7.3–7.8)	0.8 (0.5–1.2)	<.001
LOS site 2, hours, mean (95% CI)	7.6 (7.4–7.8)	7.3 (7.1–7.6)	7.9 (7.6–8.1)	0.5 (0.2–0.9)	.002
LOS site 3, hours, mean (95% CI)	7.2 (7.0–7.4)	6.6 (6.3–6.8)	7.8 (7.6–8.0)	1.2 (0.9–1.6)	<.001

CI, confidence interval; LOS, length of stay.

Pedersen CK et al. Accelerated -Rule-Out of acute Myocardial Infarction using prehospital copeptin and in-hospital troponin: The AROMI study. Eur Heart J. 2023 Oct 12;44(38):3875-3888. doi: 10.1093/eurheartj/ehad447. PMID: 37477353; PMCID: PMC10568000.

Il dolore toracico in DEA: dosaggio troponina-hs con metodica point-of-care

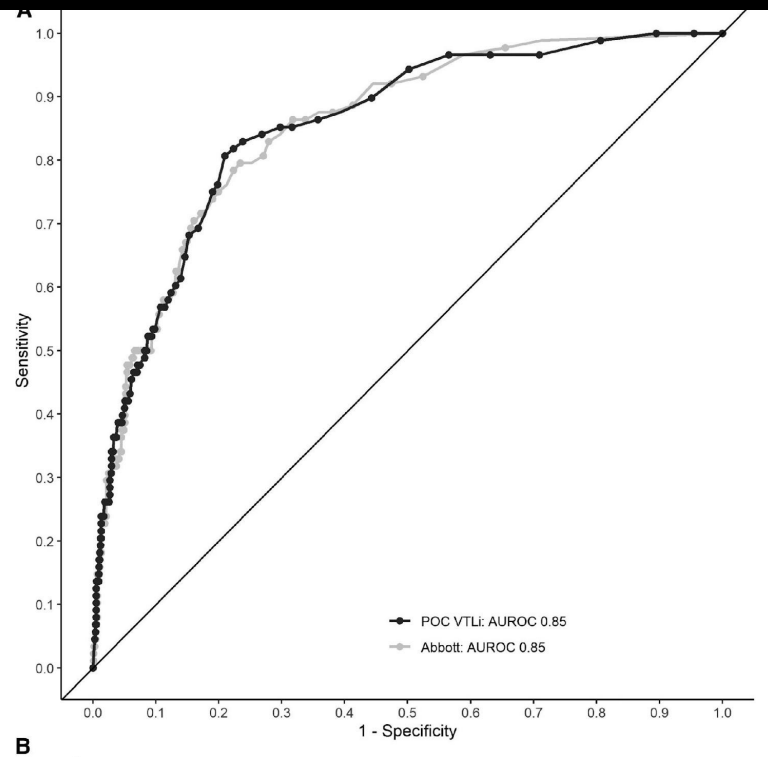
Patient Arrives in Emergency Department

↓

Whole Blood (WB) Drawn for hs-cTnI Analysis

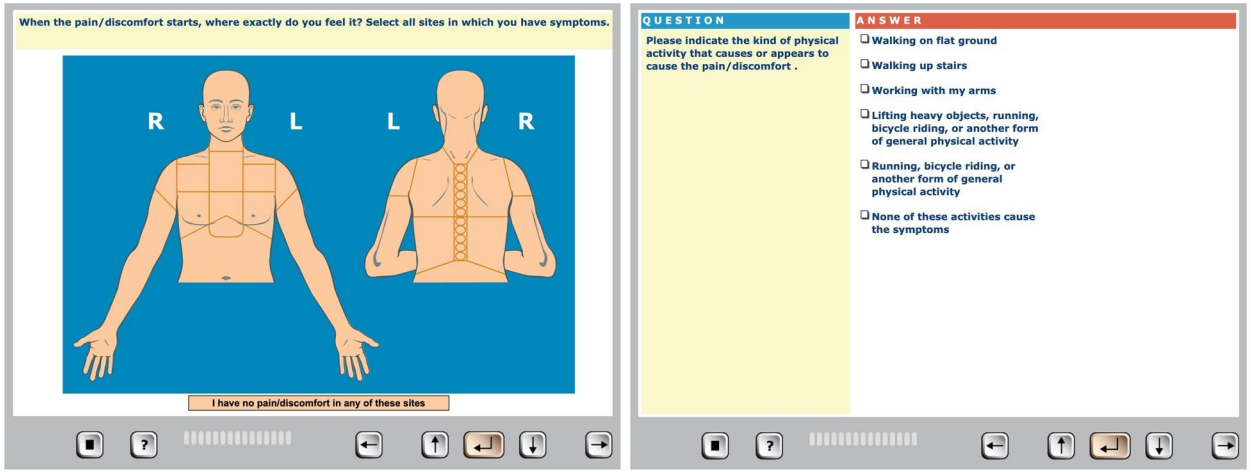
WB Tubed to Central Laboratory (5 min)	WB Transported to POC Assay (2 min)
↓	↓
Laboratory Centrifuges WB to Plasma (10 min)	POC Analyzer Measures WB hs-cTnI (8 min)
↓	↓
Central Lab Assay Measures Plasma hs-cTnI (35 min)	hs-cTnI Result Reported by EHR/verbal (2 min)
↓	
hs-cTnI Result Reported by EHR (2 min)	

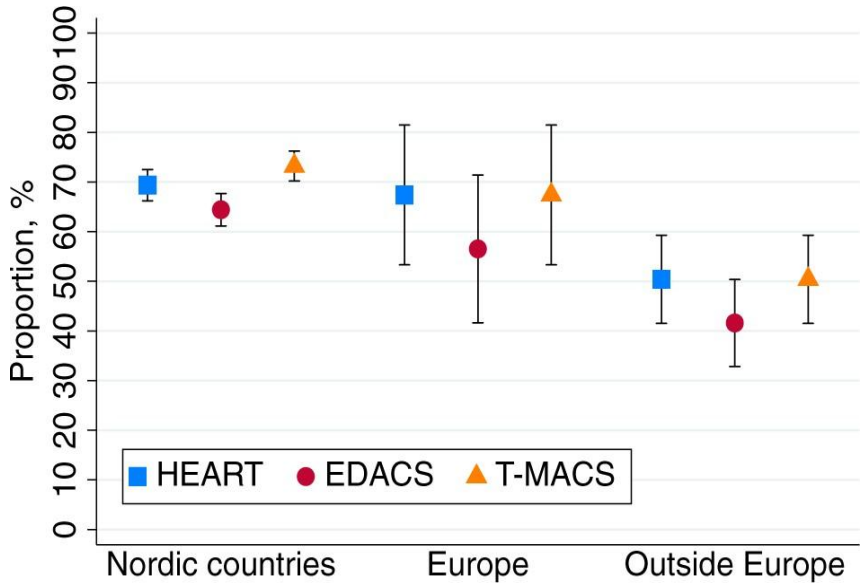
Time Difference Between POC and Central Lab Processes for hs-cTnI Result to Provider = 40 min

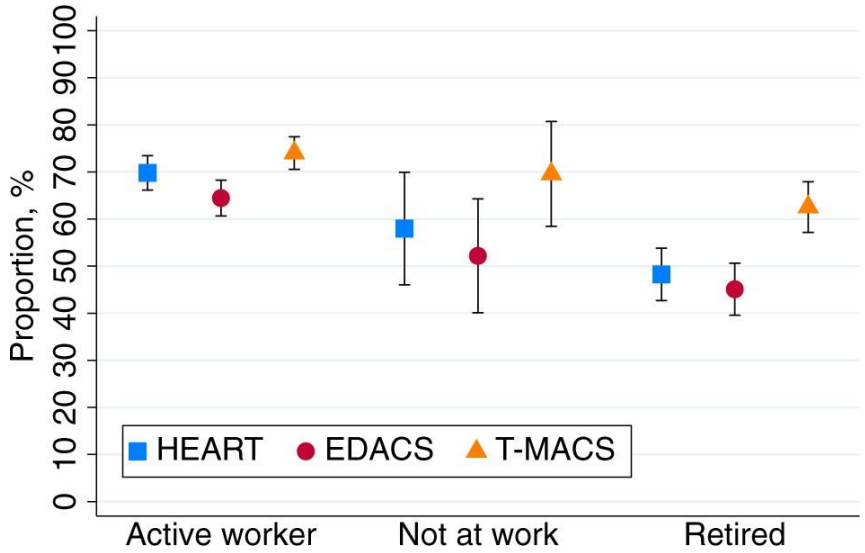


De Iuliis V et al. Clin Chem Lab Med. 2024 Apr 29. doi: 10.1515/cclm-2024-0225.
Fred S et al. Circulation. 2022 Dec 20;146(25):1918-1929. doi: 10.1161/CIRCULATIONAHA.122.061148

Il dolore toracico in DEA: auto-inserimento dati su tablet prima della visita







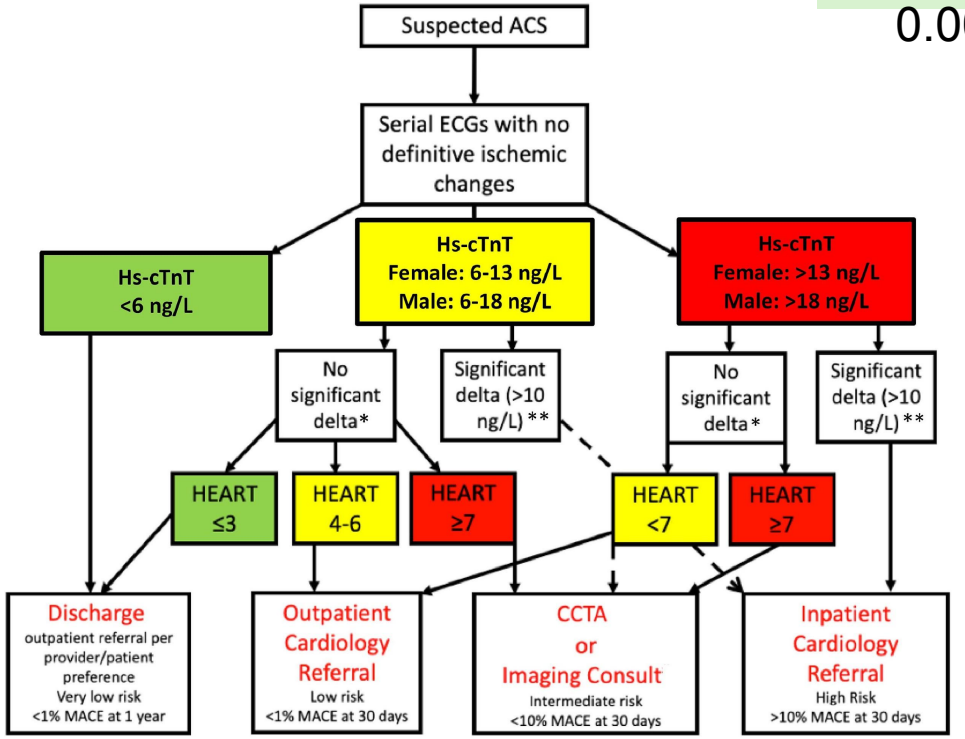
Brandberg H et al. Are medical history data fit for risk stratification of patients with chest pain in emergency care? Comparing data collected from patients using computerized history taking with data documented by physicians in the electronic health record in the CLEOS-CPDS prospective cohort study. J Am Med Inform Assoc. 2024 May 23:ocae110. doi: 10.1093/jamia/ocae110. Epub ahead of print. PMID: 38781350.

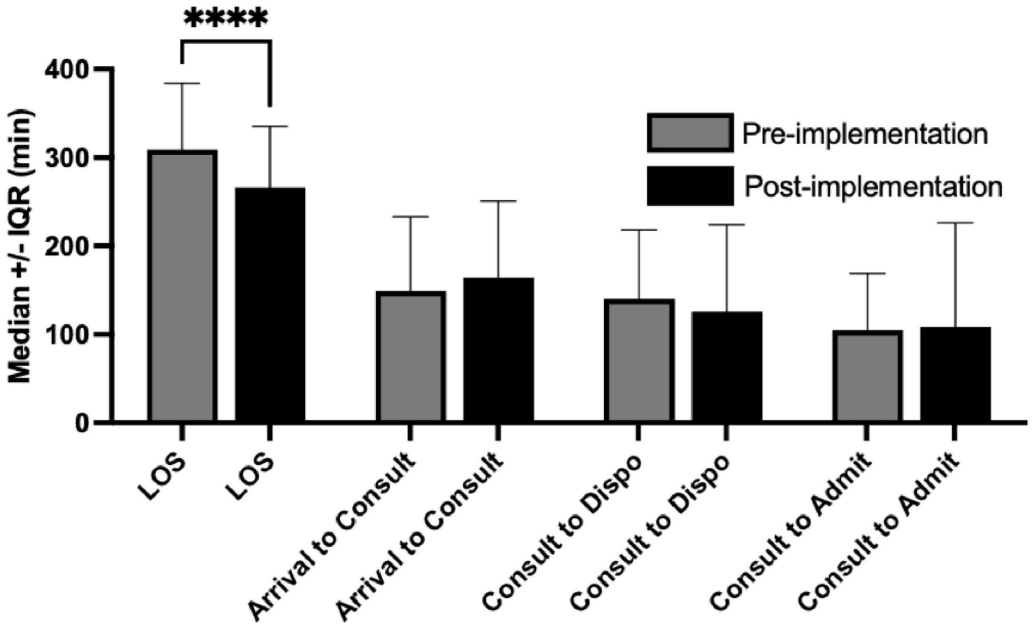
Il dolore toracico in DEA: protocolli gestionali basati su stratificazione del rischio

Lexington (KT), US
Single-center
Retrospective pre-post study
N=1707 *vs* 1529 patients

Pathway implementation:

- absolute reduction 31 min (95% CI 22-41 min)
- cardiology consult rate from 26.9% to 16.0% (p < 0.0001) rate of admission from 30.1% to 22.7% (p < 0.0001)
- ED boarders (nontraumatic chest pain) from 25.13% to 18.63% (p < 0.0001)





Zhou Z et al. Improvement of Emergency Department Chest Pain Evaluation Using Hs-cTnT and a Risk Stratification Pathway. J Emerg Med. 2024 Feb 10:S0736-4679(24)00023-4. doi: 10.1016/j.jemermed.2024.02.008. PMID: 38789352.

Il dolore toracico in DEA: conclusioni

- Il dolore toracico è una causa molto comune di visita in DEA.
- I protocolli diagnostici per le principali patologie tempo-dipendenti (SCA, TEP, SAA) sono estremamente sicuri, ma complessivamente poco efficienti nella pratica clinica dei DEA.
- La diagnostica del dolore toracico è ampia, con elevato numero di esami diagnostici richiesti ed elevato tasso di positività, in particolare nei pazienti di età avanzata.
- I tempi di gestione dei pazienti con dolore toracico in DEA sono lunghi, in particolare nelle fasi pre-cliniche e cliniche.
- Sono necessarie strategie di riduzione dei tempi di permanenza in DEA dei pazienti con dolore toracico, intervenendo in particolare su: tempi di accesso al dosaggio della troponina, tempi tecnici (es. POC), tasso di consulenza specialistica, tempi di decisione clinica.

Fulvio Morello
Università degli Studi di Torino, Dipartimento di Scienze Mediche
Dipartimento di Emergenza e Accettazione, S.C. Medicina d'Urgenza U (MECAU)
Ospedale Molinette, A.O.U. Città della Salute e della Scienza di Torino

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Prof. Enrico Lupia

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Arch. Silvia Tarditi

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Scuola di Medicina

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MS Sergio Riccardino
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