

POINTS & PEARLS

A Quick-Read Review Of Key Points & Clinical Pearls, July 2017

Identifying Emergency Department Patients With Chest Pain Who Are at Low Risk for Acute Coronary Syndromes

Points

- For the evaluation of suspected acute coronary syndromes (ACS) in the ED, consensus guidelines recommend obtaining basic history, physical examination, electrocardiogram (ECG), cardiac biomarkers, and chest radiography. If these tests are unremarkable, confirmatory tests can be performed, with a focus on diagnosis of atherosclerotic coronary artery disease (CAD).
- History cannot reliably rule in or rule out ACS.
- Features with a higher likelihood of ACS include pain radiating to both arms or shoulders, pain similar to prior ischemia, exertional pain, pain associated with diaphoresis, and a change in pain pattern over the past 24 hours.
- Features with a lower likelihood of ACS include pain described as pleuritic, positional, reproducible with palpation, sharp/stabbing, or non-exertional.
- Women are more likely to present with atypical symptoms and their exercise stress-testing results are less accurate.
- Younger patients are more likely to have low-yield confirmatory testing.
- Elderly patients may be unable to have certain confirmatory testing performed based on medical comorbidities or exercise limitations, but this is not necessarily a contraindication for all testing.
- In patients with chest pain, the physical examination is often normal, and it may be more important for assessing overall hemodynamic function and the likelihood of alternative diagnoses.
- Physical examination features that show a higher likelihood of ACS include hypotension, new mitral regurgitation murmur, and third heart sound.
- An ECG should be obtained within 10 minutes of arrival. STEMI is defined as ST elevation at the J point of ≥ 1 mm (0.1 mV) in ≥ 2 contiguous leads (except in leads V_2 - V_3 where ST elevation can be up to 1.5 mm in women, 2 mm in men aged ≥ 40 years, and 2.5 mm in men aged < 40 years).
- Conventional troponin assays can detect myocardial infarction within 3 hours of ED arrival in most patients; they have excellent sensitivity but poor specificity for myocardial infarction.

Pearls

- The 2 most useful scores for the ED evaluation of undifferentiated chest pain for suspected ACS are the TIMI and HEART Scores.
- Women, the elderly, and diabetic patients are more likely to present with atypical symptoms, such as lack of pain, pain outside of the chest, nausea, or dyspnea.
- High-sensitivity troponin assays can shorten detection time, but have decreased specificity.
- Most ED patients with chest pain who are hemodynamically stable, have normal or nondiagnostic serial ECGs, negative serial biomarkers, and low risk, based on a validated clinical score, can be safely discharged.
- If symptoms are suggestive of ACS but initial troponin is negative, a second value should be obtained in 3 to 6 hours.
- Current consensus guidelines recommend that all patients with normal serial ECGs and negative biomarkers undergo confirmatory testing before discharge or within 72 hours. Such testing adds little to no additional benefit for patients at low risk for a major adverse cardiac event (MACE).
- Patients with an unremarkable ED evaluation but who are at intermediate or high risk should be admitted to an observation or inpatient setting.
- Patients with chest pain who are at low risk for ACS or MACE may be candidates for primary prevention and lifestyle modification.

Issue Author

David Markel, MD

Attending Physician, Tacoma Emergency Care Physicians, Tacoma, WA

Points & Pearls Contributor

Jeremy Kim, MD

Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, NY

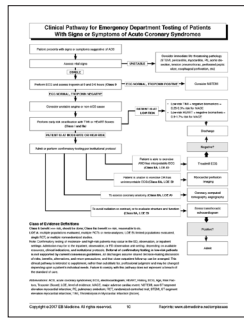
Table 2. Electrocardiographic Classification and Likelihood of 30-day Major Adverse Cardiac Event³⁹

| Electrocardiographic Classification | Positive LR for 30-day MACE |
|--|-----------------------------|
| Normal | 0.4 |
| Nonspecific ST and/or T-wave changes | 1.2 |
| Abnormal, but not diagnostic of ischemia | 1.2 |
| Ischemia or prior infarction known to be old | 2.6 |
| Ischemia or prior infarction not known to be old | 9.7 |
| Consistent with acute myocardial infarction | 15.8 |

Major adverse cardiac events include acute myocardial infarction, cardiovascular death, unstable angina, or revascularization. Abbreviations: LR, likelihood ratio; MACE, major adverse cardiac event.



Access the issue by scanning the QR code with a smartphone or tablet.



Clinical Pathway for Emergency Department Testing of Patients With Signs or Symptoms of Acute Coronary Syndromes



MDCalc Score Calculators

HEART Score for Major Cardiac Events:

<https://www.mdcalc.com/heart-score-major-cardiac-events>

TIMI Risk Score for UA/NSTEMI:

<https://www.mdcalc.com/timi-risk-score-ua-nstemi>

Questions, comments, suggestions?
To write a letter to the editor, email:
JagodaMD@ebmedicine.net



Emergency Medicine Practice subscribers: Are you getting the full value from your subscription? Visit your free online account at www.ebmedicine.net to search archives, browse clinical resources, take free CME tests to earn credit, and more.

Emergency Medicine Practice (ISSN Print: 1524-1971, ISSN Online: 1559-3908, ACID-FREE) is published monthly (12 times per year) by EB Medicine (5550 Triangle Parkway, Suite 150, Norcross, GA 30092). Opinions expressed are not necessarily those of this publication. Mention of products or services does not constitute endorsement. This publication is intended as a general guide and is intended to supplement, rather than substitute, professional judgment. It covers a highly technical and complex subject and should not be used for making specific medical decisions. The materials contained herein are not intended to establish policy, procedure, or standard of care. Copyright © 2017 EB Medicine. All rights reserved. No part of this publication may be reproduced in any format without written consent of EB Medicine. This publication is intended for the use of the individual subscriber only and may not be copied in whole or part or redistributed in any way without the publisher's prior written permission.

First Responders

What changes do you anticipate making in your practice as a result of this activity?

- “ Incorporate HEART score to better identify patients who can be safely discharged.
- “ Use TIMI score and chart this score on all chest pain patients.
- “ Be more careful with utilizing single troponin to rule out ACS.
- “ Will likely get more troponin tests on young patients to further characterize them as low risk.
- “ Will discuss role of confirmatory testing in chest pain patients since there are no good studies to show that it decreases morbidity and mortality.

Most Important References

2. Amsterdam EA, Kirk JD, Bluemke DA, et al. Testing of low-risk patients presenting to the emergency department with chest pain: a scientific statement from the American Heart Association. *Circulation*. 2010;122(17):1756-1776. (Consensus statement) DOI: <https://doi.org/10.1161/CIR.0b013e3181ec61df>
5. O'Connor RE, Al Ali AS, Brady WJ, et al. Part 9: acute coronary syndromes. 2015 American Heart Association guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*. 2015;132(18 Suppl 2):S483-S500. (Consensus guideline) DOI: <https://doi.org/10.1161/CIR.0000000000000263>
22. Fanaroff AC, Rymer JA, Goldstein SA, et al. Does this patient with chest pain have acute coronary syndrome? The Rational Clinical Examination systematic review. *JAMA*. 2015;314(18):1955-1965. (Systematic review) DOI: <https://doi.org/10.1001/jama.2015.12735>
77. Than MP, Flaws DF, Cullen L, et al. Cardiac risk stratification scoring systems for suspected acute coronary syndromes in the emergency department. *Curr Emerg Hosp Med Rep*. 2013;1(1):53-63. (Review) Available at: <https://link.springer.com/article/10.1007/s40138-012-0004-0>
80. Miller TD, Askew JW, Anavekar NS. Noninvasive stress testing for coronary artery disease. *Cardiol Clin*. 2014;32(3):387-404. (Review) DOI: <https://doi.org/10.1016/j.hfc.2015.08.006>

Contact EB Medicine:
Phone: 1-800-249-5770 or 678-366-7933
Fax: 770-500-1316
Address: 5550 Triangle Parkway,
Suite 150,
Norcross, GA 30092