

## REFERENCES

- https://www.cdc.gov/nchs/data/nhamcs/web\_tables/2015\_ed\_web\_tables.pdf (Centers for Disease Control and Prevention: National Hospital Ambulatory Medical Care Survey: 2015 Emergency Department Summary Tables.) Accessed October 25, 2018.
- Pope JH, Aufderheide TP, Ruthazer R, et al: Missed diagnoses of acute cardiac ischemia in the emergency department. *N Engl J Med* 342: 1163, 2000. [PMID: 10770981]
- Napoli AM, Baird J, Tran S, Wang J: Low adverse event rates but high emergency department utilization in chest pain patients treated in an emergency department observation unit. *Crit Pathw Cardiol* 16: 15, 2017. [PMID: 28195938]
- Pines JM, Isserman JA, Szyld D, Dean AJ, McCusker CM, Hollander JE: The effect of physician risk tolerance and the presence of an observation unit on decision making for ED patients with chest pain. *Am J Emerg Med* 28: 771, 2010. [PMID: 20837253]
- Penumesta SC, Mallidi J, Friderici JL, Hiser W, Rothberg MB: Outcomes of patients admitted for observation of chest pain. *Arch Intern Med* 172: 873, 2012. [PMID: 22566486]
- Benjamin EJ, Virani SS, Callaway CW, et al: Heart disease and stroke statistics—2018 update: a report from the American Heart Association. *Circulation* 137: e67, 2018. [PMID: 29386200]
- Canto JG, Shlipak MG, Rogers WJ, et al: Prevalence, clinical characteristics, and mortality among patients with myocardial infarction presenting without chest pain. *JAMA* 283: 3223, 2000. [PMID: 10866870]
- Swap CJ, Nagurny JT: Value and limitations of chest pain history in the evaluation of patients with suspected acute coronary syndromes. *JAMA* 294: 2623, 2005. [PMID: 16304077]
- Lee TH, Juarez G, Cook EF, et al: Ruling out acute myocardial infarction. A prospective multicenter validation of a 12-hour strategy for patients at low risk. *N Engl J Med* 324: 1239, 1991. [PMID: 2014037]
- Canto JG, Goldberg RJ, Hand MM, et al: Symptom presentation of women with acute coronary syndromes: myth vs reality. *Arch Intern Med* 167: 2405, 2007. [PMID: 18071161]
- Gupta M, Tabas JA, Kohn MA: Presenting complaint among patients with myocardial infarction who present to an urban, public hospital emergency department. *Ann Emerg Med* 40: 180, 2002. [PMID: 12140497]
- Bates MS, Rankin-Hill L, Sanchez-Ayendez M: The effects of the cultural context of health care on treatment of and response to chronic pain and illness. *Soc Sci Med* 45: 1433, 1997. [PMID: 9351160]
- Farmer SA, Higginson IJ: Chest pain: physician perceptions and decision-making in a London emergency department. *Ann Emerg Med* 48: 77, 2006. [PMID: 16781923]
- Farmer SA, Roter DL, Higginson IJ: Chest pain: communication of symptoms and history in a London emergency department. *Patient Educ Couns* 63: 138, 2006. [PMID: 16242896]
- Summers RL, Cooper GJ, Carlton FB, Andrews ME, Kolb JC: Prevalence of atypical chest pain descriptions in a population from the southern United States. *Am J Med Sci* 318: 142, 1999. [PMID: 10487403]
- Arsanian-Engoren C, Patel A, Fang J, et al: Symptoms of men and women presenting with acute coronary syndromes. *Am J Cardiol* 98: 1177, 2006. [PMID: 17056322]
- Abidov A, Rozanski A, Hachamovitch R, et al: Prognostic significance of dyspnea in patients referred for cardiac stress testing. *N Engl J Med* 353: 1889, 2005. [PMID: 16267320]
- Stokes J 3rd, Kannel WB, Wolf PA, Cupples LA, D'Agostino RB: The relative importance of selected risk factors for various manifestations of cardiovascular disease among men and women from 35 to 64 years old: 30 years of follow-up in the Framingham Study. *Circulation* 75: V65, 1987. [PMID: 3568338]
- Sytkowski PA, Kannel WB, D'Agostino RB: Changes in risk factors and the decline in mortality from cardiovascular disease. The Framingham Heart Study. *N Engl J Med* 322: 1635, 1990. [PMID: 2288563]
- Benzaquen BS, Cohen V, Eisenberg MJ: Effects of cocaine on the coronary arteries. *Am Heart J* 142: 402, 2001. [PMID: 11526352]
- Pletcher MJ, Kiefe CI, Sidney S, Carr JJ, Lewis CE, Hulley SB: Cocaine and coronary calcification in young adults: the Coronary Artery Risk Development in Young Adults (CARDIA) Study. *Am Heart J* 150: 921, 2005. [PMID: 16290964]
- Singh V, Rodriguez AP, Thakkar B, et al: Hospital admissions for chest pain associated with cocaine use in the United States. *Am J Med* 130: 688, 2017. [PMID: 28063854]
- Mangili A, Gerrior J, Tang AM, et al: Risk of cardiovascular disease in a cohort of HIV-infected adults: a study using carotid intima-media thickness and coronary artery calcium score. *Clin Infect Dis* 43: 1482, 2006. [PMID: 17083026]
- Body R, Carley S, Wibberley C, et al: The value of symptoms and signs in the emergent diagnosis of acute coronary syndromes. *Resuscitation* 81: 281, 2010. [PMID: 20036454]
- Dezmann ZD, Mattu A, Body R: Utility of the history and physical examination in the detection of acute coronary syndromes in emergency department patients. *West J Emerg Med* 18: 752, 2017. [PMID: 28611898]
- Hess EP, Brison RJ, Perry JJ, et al: Development of a clinical prediction rule for 30-day cardiac events in emergency department patients with chest pain and possible acute coronary syndrome. *Ann Emerg Med* 59: 115, 2012. [PMID: 21885156]
- Goodacre S, Locker T, Morris F, Campbell S: How useful are clinical features in the diagnosis of acute, undifferentiated chest pain? *Acad Emerg Med* 9: 203, 2002. [PMID: 11874776]
- Rubini Gimenez M, Reiter M, Twerenbold R, et al: Sex-specific chest pain characteristics in the early diagnosis of acute myocardial infarction. *JAMA Intern Med* 174: 241, 2014. [PMID: 24275751]
- Lee TH, Cook EF, Weisberg M, Sargent RK, Wilson C, Goldman L: Acute chest pain in the emergency room. Identification and examination of low-risk patients. *Arch Intern Med* 145: 65, 1985. [PMID: 3970650]
- Henrikson CA, Howell EE, Bush DE, et al: Chest pain relief by nitroglycerin does not predict active coronary artery disease. *Ann Intern Med* 139: 979, 2003. [PMID: 14678917]
- Diercks DB, Boghos E, Guzman H, Amsterdam EA, Kirk JD: Changes in the numeric descriptive scale for pain after sublingual nitroglycerin do not predict cardiac etiology of chest pain. *Ann Emerg Med* 45: 581, 2005. [PMID: 15940087]
- Shry EA, Dacus J, Van De Graaff E, Hjelkrem M, Stajduhar KC, Steinhilb SR: Usefulness of the response to sublingual nitroglycerin as a predictor of ischemic chest pain in the emergency department. *Am J Cardiol* 90: 1264, 2002. [PMID: 12450614]
- Chan S, Maurice AP, Davies SR, et al: The use of gastrointestinal cocktail for differentiating gastro-oesophageal reflux disease and acute coronary syndrome in the emergency setting: a systematic review. *Heart Lung Circ* 23: 913, 2014. [PMID: 24791662]
- Stein PD, Beemath A, Matta F, et al: Clinical characteristics of patients with acute pulmonary embolism: data from PLOPED II. *Am J Med* 120: 871, 2007. [PMID: 17904458]
- Klok FA, Kruisman E, Spaan J, et al: Comparison of the revised Geneva score with the Wells rule for assessing clinical probability of pulmonary embolism. *J Thromb Haemost* 6: 40, 2008. [PMID: 17973649]
- Freund Y, Cachanado M, Aubry A, et al: Effect of the pulmonary embolism rule-out criteria on subsequent thromboembolic events among low-risk emergency department patients. The PROPER randomized clinical trial. *JAMA* 319: 559, 2018. [PMID: 29450523]
- Carrier M, Righini M, Djourabi RK, et al: VIDAS D-dimer in combination with clinical pre-test probability to rule out pulmonary embolism. A systematic review of management outcome studies. *Thromb Haemost* 101: 886, 2009. [PMID: 19404542]
- Crawford F, Andras A, Welch K, et al: D-dimer test for excluding the diagnosis of pulmonary embolism. *Cochrane Database Syst Rev* 8: CD010864, 2016. [PMID: 27494075]
- Ng AC, Yong AS, Chow V, et al: Cardiac troponin-T and the prediction of acute and long-term mortality after acute pulmonary embolism. *Int J Cardiol* 165: 126, 2013. [PMID: 21864916]
- Ohle R, Um J, Anjum O, et al: High risk clinical features for acute aortic dissection: a case-control study. *Acad Emerg Med* 25: 378, 2018. [PMID: 29218798]
- Hiratzka LF, Bakris GL, Beckman JA, et al: 2010 ACCF/AHA/AAATS/ACR/ASA/SCA/SCAI/SIR/STS/SVM guidelines for the diagnosis and management of patients with thoracic aortic disease: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, American Association for Thoracic Surgery, American College of Radiology, American Stroke Association, Society of Cardiovascular Anesthesiologists, Society for Cardiovascular Angiography and Interventions, Society of Interventional Radiology, Society of Thoracic Surgeons, and Society for Vascular Medicine. *Circulation* 121: e266, 2010. [PMID: 20233780]
- American College of Emergency Physicians Clinical Policies Subcommittee (Writing Committee) on Thoracic Aortic Dissection, Diercks DB, Prodes SB, et al: Clinical policy: critical issues in the evaluation and management of adult patients with suspected acute nontraumatic thoracic aortic dissection. *Ann Emerg Med* 65: 32, 2015. [PMID: 25529153]
- Hirata K, Wake M, Kyushima M, et al: Electrocardiographic changes in patients with type A acute aortic dissection. Incidence, patterns and underlying mechanisms in 159 cases. *J Cardiol* 56: 147, 2010. [PMID: 20434885]
- Costin NI, Korach A, Loor G, et al: Patients with type A acute aortic dissection presenting with an abnormal electrocardiogram. *Ann Thorac Surg* 105: 92, 2018. [PMID: 29074152]
- Newby LK, Jesse RL, Babb JD, et al: ACCF 2012 expert consensus document on practical clinical considerations in the interpretation of troponin elevations: a report of the American College of Cardiology Foundation task force on Clinical Expert Consensus Documents. *J Am Coll Cardiol* 60: 2427, 2012. [PMID: 23154053]
- Moore M, Stuart B, Little P, et al: Predictors of pneumonia in lower respiratory tract infections: 3C prospective cough complication cohort study. *Eur Respir J* 50: pii:1700434, 2017. [PMID: 29167296]
- Weissberg D, Refaely Y: Pneumothorax: experience with 1,199 patients. *Chest* 117: 1279, 2000. [PMID: 10807811]
- Spodick DH: Acute pericarditis: current concepts and practice. *JAMA* 289: 1150, 2003. [PMID: 12622586]
- Freed LA, Levy D, Levine RA, et al: Prevalence and clinical outcome of mitral-valve prolapse. *N Engl J Med* 341: 1, 1999. [PMID: 10387935]
- Devereux RB, Kramer-Fox R, Brown WT, et al: Relation between clinical features of the mitral prolapse syndrome and echocardiographically documented mitral valve prolapse. *J Am Coll Cardiol* 8: 763, 1986. [PMID: 3760352]
- Fleet RP, Dupuis G, Marchand A, Burelle D, Arsenault A, Beitman BD: Panic disorder in emergency department chest pain patients: prevalence, comorbidity, suicidal ideation, and physician recognition. *Am J Med* 101: 371, 1996. [PMID: 8873507]
- 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* 122: 1756, 2010. [PMID: 20660809]

53. Amsterdam EA, Wenger NK, Brindis RG, et al: 2014 AHA/ACC guideline for the management of patients with non-ST-elevation acute coronary syndromes: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol* 64: e139, 2014. [PMID: 25260718]
54. Masoudi FA, Magid DJ, Vinson DR, et al: Implications of the failure to identify high-risk electrocardiogram findings for the quality of care of patients with acute myocardial infarction: results of the Emergency Department Quality in Myocardial Infarction (EDQMI) study. *Circulation* 114: 1565, 2006. [PMID: 17015790]
55. Yiadom MY, Baugh CW, McWade CM, et al: Performance of emergency department screening criteria for an early ECG to identify ST-segment elevation myocardial infarction. *J Am Heart Assoc* 6: pii: e003528, 2017. [PMID: 28232323]
56. Bradley EH, Herrin J, Wang Y, et al: Strategies for reducing the door-to-balloon time in acute myocardial infarction. *N Engl J Med* 355: 2308, 2006. [PMID: 17101617]
57. Quinn T, Johnsen S, Gale CP, et al: Effects of prehospital 12-lead ECG on processes of care and mortality in acute coronary syndrome: a linked cohort study from the Myocardial Ischaemia National Audit Project. *Heart* 100: 944, 2014. [PMID: 24732676]
58. Brodie BR, Gersh BJ, Stuckey T, et al: When is door-to-balloon time critical? Analysis from the HORIZONS-AMI (Harmonizing Outcomes with Revascularization and Stents in Acute Myocardial Infarction) and CADILLAC (Controlled Abciximab and Device Investigation to Lower Late Angioplasty Complications) trials. *J Am Coll Cardiol* 56: 407, 2010. [PMID: 20650362]
59. Weaver WD, Cerqueira M, Hallstrom AP, et al: Prehospital-initiated vs hospital-initiated thrombolytic therapy. The Myocardial Infarction Triage and Intervention Trial. *JAMA* 270: 1211, 1993. [PMID: 8353383]
60. Farkouh ME, Aneja A, Reeder GS, et al: Clinical risk stratification in the emergency department predicts long-term cardiovascular outcomes in a population-based cohort presenting with acute chest pain: primary results of the Olmsted county chest pain study. *Medicine (Baltimore)* 88: 307, 2009. [PMID: 19745690]
61. Welch RD, Zalenski RJ, Frederick PD, et al: Prognostic value of a normal or nonspecific initial electrocardiogram in acute myocardial infarction. *JAMA* 286: 1977, 2001. [PMID: 11667934]
62. Slater DK, Hlatky MA, Mark DB, Harrell FE Jr, Pryor DB, Califf RM: Outcome in suspected acute myocardial infarction with normal or minimally abnormal admission electrocardiographic findings. *Am J Cardiol* 60: 766, 1987. [PMID: 3661390]
63. Kontos MC, Desai PV, Jesse RL, Ornato JP: Usefulness of the admission electrocardiogram for identifying the infarct-related artery in inferior wall acute myocardial infarction. *Am J Cardiol* 79: 182, 1997. [PMID: 9193020]
64. Forest RS, Shofer FS, Sease KL, Hollander JE: Assessment of the standardized reporting guidelines ECG classification system: the presenting ECG predicts 30-day outcomes. *Ann Emerg Med* 44: 206, 2004. [PMID: 15332059]
65. Kontos MC, Diercks DB, Kirk JD: Emergency department and office-based evaluation of patients with chest pain. *Mayo Clin Proc* 85: 284, 2010. [PMID: 20194155]
66. Walker NJ, Sites FD, Shofer FS, Hollander JE: Characteristics and outcomes of young adults who present to the emergency department with chest pain. *Acad Emerg Med* 8: 703, 2001. [PMID: 11435184]
67. Apple FS: Tissue specificity of cardiac troponin I, cardiac troponin T and creatine kinase-MB. *Clin Chim Acta* 284: 151, 1999. [PMID: 10451242]
68. Rempis A, Scheffold T, Greten J, et al: Intracellular compartmentation of troponin T: release kinetics after global ischemia and calcium paradox in the isolated perfused rat heart. *J Mol Cell Cardiol* 27: 793, 1995. [PMID: 7776386]
69. Thygesen K, Alpert JS, Jaffe AS, et al: Third universal definition of myocardial infarction. *Circulation* 126: 2020, 2012. [PMID: 22923432]
70. Sandoval Y, Herzog CA, Love SA, et al: Prognostic value of serial changes in high-sensitivity cardiac troponin I and T over 3 months using reference change values in hemodialysis patients. *Clin Chem* 62: 631, 2016. [PMID: 26847217]
71. de Lemos JA: Increasingly sensitive assays for cardiac troponins: a review. *JAMA* 309: 2262, 2013. [PMID: 23736735]
72. Antman EM, Tanasijevic MJ, Thompson B, et al: Cardiac-specific troponin I levels to predict the risk of mortality in patients with acute coronary syndromes. *N Engl J Med* 335: 1342, 1996. [PMID: 8857017]
73. Bonaca M, Scirica B, Sabatine M, et al: Prospective evaluation of the prognostic implications of improved assay performance with a sensitive assay for cardiac troponin I. *J Am Coll Cardiol* 55: 2118, 2010. [PMID: 20447535]
74. Wu A, Christenson RH, Greene DN, et al: Clinical laboratory practice recommendations for the use of cardiac troponin in acute coronary syndromes: expert opinion from the academy of the american association for clinical chemistry and the task force on clinical applications of cardiac bio-markers of the International Federation of Clinical Chemistry. *Clin Chem* 64: 645, 2018. [PMID: 29343532]
75. Aldous S, Mark Richards A, George PM, et al: Comparison of new point-of-care troponin assay with high sensitivity troponin in diagnosing myocardial infarction. *Int J Cardiol* 177: 182, 2014. [PMID: 25499373]
76. Macrae AR, Kavsak PA, Lustig V, et al: Assessing the requirement for the 6-hour interval between specimens in the American Heart Association Classification of Myocardial Infarction in Epidemiology and Clinical Research Studies. *Clin Chem* 52: 812, 2006. [PMID: 16556688]
77. Apple FS, Collinson PO, The IFCC Task Force on Clinical Applications of Cardiac Biomarkers: Analytical characteristics of high-sensitivity cardiac troponin assays. *Clin Chem* 58: 54, 2012. [PMID: 21965555]
78. Reichlin T, Hochholzer W, Bassetti S, et al: Early diagnosis of myocardial infarction with sensitive cardiac troponin assays. *N Engl J Med* 361: 858, 2009. [PMID: 19710484]
79. Keller T, Zeller T, Peetz D, et al: Sensitive troponin I assay in early diagnosis of acute myocardial infarction. *N Engl J Med* 361: 868, 2009. [PMID: 19710485]
80. Ottani F, Galvani M, Nicolini FA, et al: Elevated cardiac troponin levels predict the risk of adverse outcome in patients with acute coronary syndromes. *Am Heart J* 140: 917, 2000. [PMID: 11099996]
81. Carlson ER, Percy RF, Angiolillo DJ, Conetta DA: Prognostic significance of troponin T elevation in patients without chest pain. *Am J Cardiol* 102: 668, 2008. [PMID: 18773985]
82. Daniels LB, Laughlin GA, Clopton P, Maisel AS, Barrett-Connor E: Minimally elevated cardiac troponin T and elevated N-terminal pro-B-type natriuretic peptide predict mortality in older adults: results from the Rancho Bernardo Study. *J Am Coll Cardiol* 52: 450, 2008. [PMID: 18672166]
83. Cameron SJ, Green GB: Cardiac biomarkers in renal disease: the fog is slowly lifting. *Clin Chem* 50: 2233, 2004. [PMID: 15563482]
84. Acharji S, Baber U, Mehran R, et al: Prognostic significance of elevated baseline troponin in patients with acute coronary syndromes and chronic kidney disease treated with different antithrombotic regimens: a substudy from the ACUTITY trial. *Circ Cardiovasc Interv* 5: 157, 2012. [PMID: 22354934]
85. Hamm CW, Bassand JP, Agewall S, et al: ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation: the task force for the management of acute coronary syndromes (ACS) in patients presenting without persistent ST-segment elevation of the European Society of Cardiology (ESC). *Eur Heart J* 32: 2999, 2011. [PMID: 21873419]
86. Than M, Cullen L, Aldous S, et al: 2-Hour accelerated diagnostic protocol to assess patients with chest pain symptoms using contemporary troponins as the only biomarker: the ADAPT trial. *J Am Coll Cardiol* 59: 2091, 2012. [PMID: 22578923]
87. Mahler SA, Riley RF, Hiestand BC, et al: The HEART Pathway randomized trial: identifying emergency department patients with acute chest pain for early discharge. *Circ Cardiovasc Qual Outcomes* 8: 195, 2015. [PMID: 25737484]
88. Mueller C, Giannitsis E, Christ M, et al: Multicenter evaluation of a 0-hour/1-hour algorithm in the diagnosis of myocardial infarction with high-sensitivity cardiac troponin T. *Ann Emerg Med* 68: 76, 2016. [PMID: 26794254]
89. Carlton EW, Khattab A, Greaves K: Identifying patients suitable for discharge after a single-presentation high-sensitivity troponin result: a comparison of five established risk scores and two high-sensitivity assays. *Ann Emerg Med* 66: 635, 2015. [PMID: 26260100]