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## Women & Heart Disease: CAD UNTIL PROVEN OTHERWISE



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Every year, more women die of heart disease than men. Traditionally, however, coronary artery disease (CAD) has been considered to be a disease of men.

Yet, it is the number one killer of women. In fact, it is responsible for almost 250,000 deaths annually.<sup>1</sup> Still, many women do not realize the significance of this problem. Recent surveys have indicated that women believe breast cancer to be their most serious health risk. However, more women die from cardiovascular disease than from the next 16 leading causes of death combined. This includes all forms of cancer. Surprisingly, in a 1994 survey, 30 percent of primary care physicians were unaware that cardiovascular disease is the single leading cause of death among women in the United States.<sup>2</sup>

### The Differences in Women's Hearts Risk Factors

The risk factors for CAD in women are similar to those for men (cigarette smoking, hypertension, dyslipidemia, diabetes, obesity, sedentary lifestyle and poor nutrition); however, some differences do exist. The number one risk factor in women is diabetes, which increases a woman's risk five- to sevenfold over other women her age. This is regardless of whether it is type 1 or type 2 diabetes.<sup>3</sup> The next most powerful risk factor is tobacco usage. This is particularly worrisome in a woman who has an elevated lipoprotein. Total cholesterol and low-

density lipoprotein levels, strong predictors in men, are poor predictors of CAD in women. However, high-density lipoprotein cholesterol (HDL-C) is strongly and inversely associated with CAD risk in women. Triglycerides are also an independent predictor of coronary heart disease risk in women.<sup>4</sup> The metabolic syndrome (low HDL, high TG, insulin resistance or diabetes, hypertension and central obesity) has an increased risk of atherosclerotic disease and is very concerning for CAD in women. Menopause accelerates coronary risk threefold and greatly erodes the early advantage of women over men. Unfortunately, at present, hormone replacement therapy is very controversial and not recommended for coronary risk reduction.<sup>5</sup> There are also specific groups of women who, by virtue of having a defined physiologic disease, may be at high risk for CAD. These include women with systemic lupus erythematosus,<sup>6</sup> polycystic ovarian syndrome,<sup>7</sup> and preeclampsia.<sup>8</sup>

### Symptom Presentation in Women

Heart disease in women often goes undetected and untreated until the disease has become severe. Among individuals presenting to the hospital with typical ischemic cardiac pain, men are more likely to have Q-wave infarctions and significant CAD at catheterization. However, women are more likely to have clinically insignificant coronary artery stenosis at catheterization despite angina symptoms.<sup>9</sup> This has led to the misconception that women do

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not have CAD. The truth is that typical symptoms for angina fail to diagnose women with CAD. Women are also more likely to have a silent myocardial infarction (MI) and a higher mortality rate from CAD, even when controlled for age.<sup>10</sup>

The WISE<sup>11</sup> (Women's Ischemia Syndrome Evaluation) study is currently underway to determine what symptoms are reliable in women. The National Heart, Lung & Blood Institute (NHLBI)-sponsored multicenter study is evaluating 1,000 women with suspected CAD through detailed evaluation of symptoms, risk factors and diagnostic testing. Preliminary results show that the presence of arm-shoulder pain, absence of neck pain, and absence of palpitations provides better accuracy of diagnosing angina in women than traditional symptoms.

**Women and men experience many of the same warning signs of a heart attack, but some less classic symptoms may signal a heart attack in women.<sup>12</sup> In addition to the classic warning signs—pressure, fullness, squeezing pain in the center of the chest—some of these less classic warnings include:**

- Pain in the arm/shoulder, back and stomach or indigestion
- Nausea or dizziness
- Shortness of breath and difficulty breathing
- Unexplained anxiety, weakness or fatigue, decreased exercise tolerance
- Cold sweats
- Edema or swelling, particularly the ankles and lower extremities

### Diagnostics

Standard exercise treadmill testing can be used, but is less accurate in women than in men.<sup>13</sup> Perfusion scans using gated SPECT in women improves test accuracy. Nuclear imaging or echocardiography with stress testing markedly improves the sensitivity and specificity of testing.

### Diagnosis

Chest pain is a common symptom that may represent a condition as serious as MI or as benign as a strained chest muscle. Every complaint of chest pain must be taken seriously, especially in a

woman over thirty with a history of diabetes or smoking. There have been numerous advancements in the assessment of patients with symptoms suggestive of MI. These include time-dependent cardiac enzymes, echocardiography, angiography and nuclear imaging. Despite these technologies, a carefully conducted history and physical (H&P) examination remains the first component and cornerstone in the initial assessment of chest pain. However, if the physician is not looking for cardiac chest pain, the more subtle or atypical presentations will be missed.

The H&P is critical in guiding selection of further diagnostic and therapeutic interventions. Physicians should complement their clinical examination with a 12-lead EKG and cardiac enzymes for suspected MI. However, in every patient in whom MI is entertained due to a presentation of chest pain, there must be a concurrent consideration of other diagnoses which may carry the same order of risk as missed MI. Because the history in both men and women who have CAD may be rather nonspecific, the decision regarding the need for further evaluation should be as aggressive for women as it is for men.

Chest pain is known as the hallmark sign of an acute myocardial infarction. Yet new research calls into question the extent to which clinicians emphasize chest pain in diagnosing MIs. An April 2000 study in the *New England Journal of Medicine* showed that an absence of typical chest pain was a significant predictor of missed MI in emergency departments. In addition, a recent nationwide review of hospitalized MI patients indicates that fully one-third of heart attacks occur without the hallmark symptom of chest pain—and that their outcomes are worse.

The specific words “chest pain” have apparently been overemphasized. We will need to look for different wording: “chest discomfort” or “funny feelings” or patients may say “I have indigestion” while putting their hands over their chest. Primary care physicians may be the first to hear from patients who realize something is wrong, but don't know what it is because there is no “typical” chest pain. We must look past the classic profile of the “type A male” and also consider CAD as an equal opportunity women's disease.

## Differential Diagnosis of Chest Pain Syndromes

Diagnosis	Presentation	Physical Exam	Ancillary Tests
Pulmonary Embolism	Sudden onset, pleuritic pain and dyspnea	Tachypnea, tachycardia, deep vein thrombosis	ABG, CXR, V/Q scan, Angiogram/Venogram, spiral CT
Aortic dissection	Tearing pain with radiation to back, neurologic symptoms	New murmur, bruits, unequal or missing pulses, unequal BP in upper extremities	CXR (wide mediastinum) Angiogram, TEE
Pericarditis	Positional ache, dyspnea which worsens on inspiration	Friction rub, distended neck veins, occasionally fever	EKG, CXR, sonogram, CBC (high sed rate)
Pneumothorax	Pleuritic pain and dyspnea	Decreased breath sounds	CXR
Acute Coronary Syndrome	Vague, pressure-like pain, radiation to arm, neck, jaw, dyspnea, nausea, heaviness, burning, anxiety, weakness, fatigue	Diaphoresis, rales, edema; or may be normal	EKG, Cardiac isoenzymes, Troponin I, ECHO in the ER
Esophageal Rupture	Constant retrosternal pain, epigastric pain, history of inciting event	Variable, subcutaneous emphysema	CXR
Pneumonia	Pleuritic pain, cough, dyspnea, chills	Fever, rhonchi, decreased breath sounds, splinting	CXR, WBC (elevated)
Costochondritis	Chest wall pain with point tenderness, pain exacerbated with movement such as coughing or twisting	Pain with deep palpation, stretching or change in position	None - usually a diagnosis of exclusion

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### Preventing Misdiagnosis

Lack of physicians' awareness of women's risk factors and symptoms for CAD is one of the main causes of misdiagnosis. Preconceptions exist regarding the "MI candidate." It is especially important for a heart attack to be diagnosed early, as the consequences of a delayed diagnosis can be serious. Sometimes with a heart attack, all the damage that is going to be done is done within four to six hours. In other cases, there may be ongoing damage. In either case, we do know that early treatment can help prevent some of the damage.

If a heart attack is diagnosed within the first few hours, fibrinolytics and artery-opening surgical procedures may restore blood flow to damaged heart tissue. When a delay in diagnosis occurs, these heart-saving measures may no longer be an option. Unfortunately, the patient who presents for treatment rarely presents with the textbook description of angina. More often, the patient's story contains a combination of typical and atypical clinical features. It is possible for a patient to have a normal EKG, normal cardiac enzymes and a normal exam—and still have a cardiac cause for their discomfort.

In 1999, Physician Insurers Association of America (PIAA) released an update on its 1996 study which focused on Acute Myocardial Infarction. As in

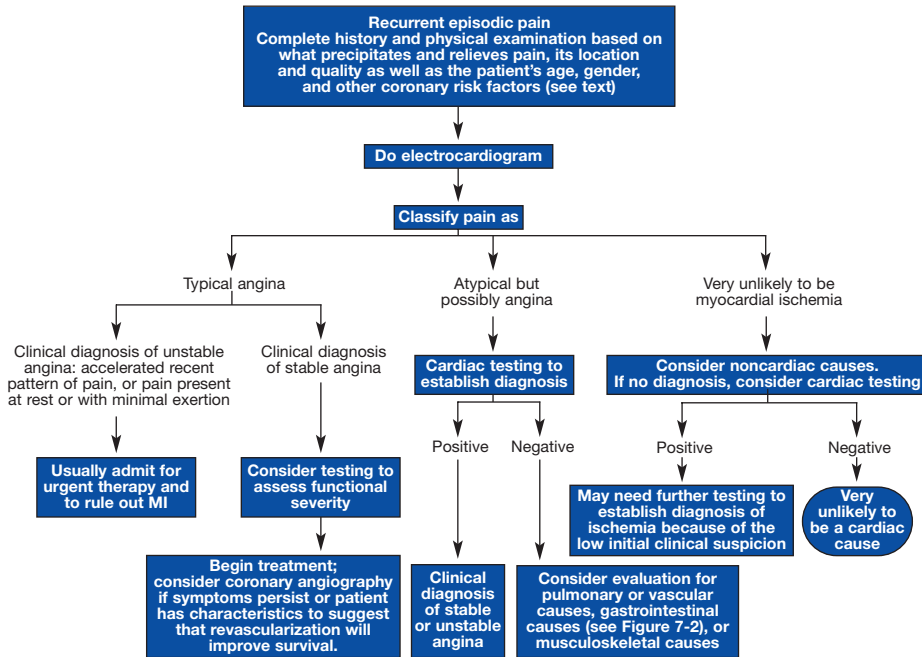
1996, the 1999 study found that diagnosis errors are still the most prevalent medical misadventure related to acute MI.<sup>14</sup> For those diagnosis-related claims closed in 2000, the total indemnity paid was \$6.6 million, with an average payment of \$277,019.<sup>15</sup>

A gastrointestinal condition was the most common incorrect physician impression, occurring in 26 percent of the malpractice suits. A musculoskeletal complaint was the second most common incorrect impression, occurring in 21 percent of the malpractice suits.

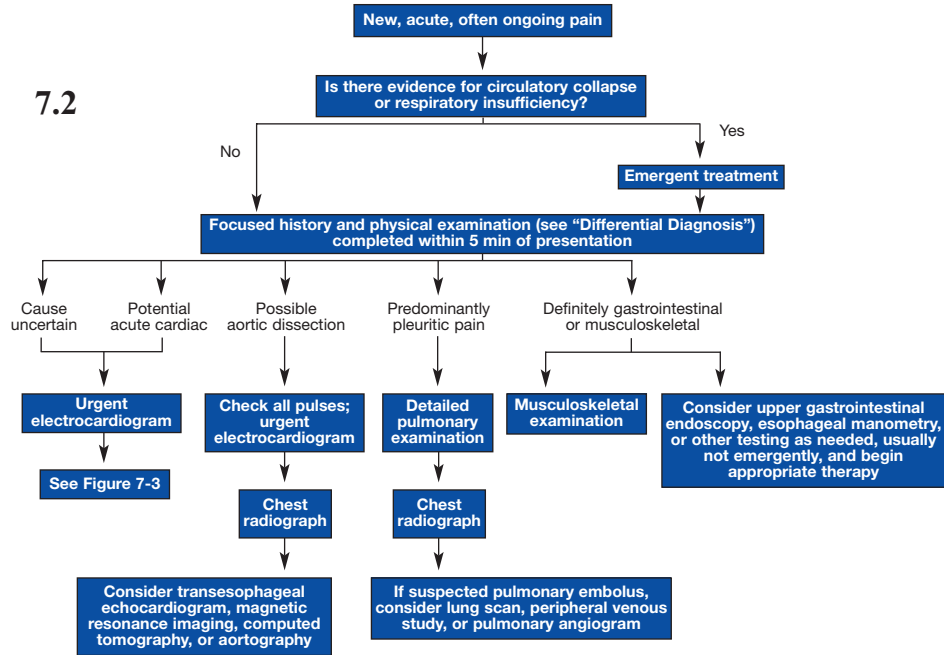
### PIAA Top Five Factors Contributing to Diagnosis Errors

- Failure to order or delay in ordering appropriate studies (55 percent of claims)
- Physicians' failure to suspect MI (48 percent of claims)
- Failure to admit or delay in hospital admission (39 percent of claims)
- Failure to refer or delay in making a timely referral or consultation (31 percent of claims)
- Misinterpretation of studies (27 percent of claims)

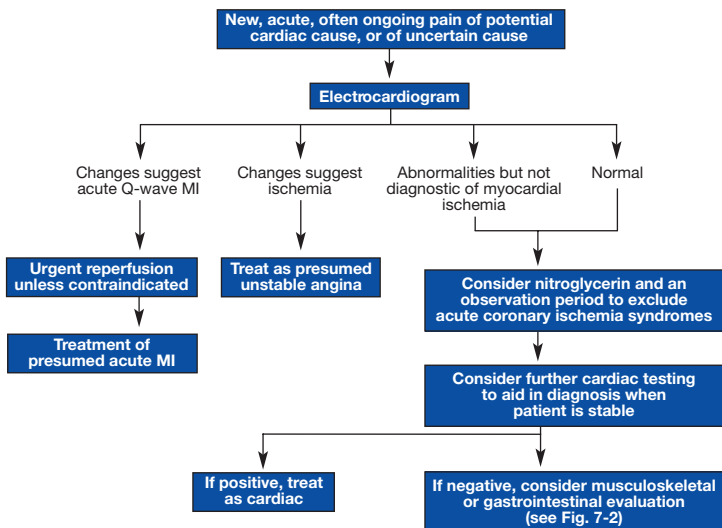
The cost of misdiagnosis and management of acute MI is in excess of \$99 billion annually. Low to moderate patient workup cost is approximately \$3 billion.



7.2



7.3



From Goldman, L: Chest discomfort and palpitation. Fauci AS, Braunwald E, Isselbacher K.I. et al. [eds]: *Harrison's Principles of Internal Medicine*. 14th ed. 1998. p62. New York, McGraw Hill.

# CLOSED CLAIM ABSTRACTS - Missed MI in Women

by Karol DeVito, R.N., Risk Management Consultant

## CASE ONE:

A 33-year-old female presented to the ER with complaints of burning substernal chest pain, nausea and left arm and jaw pain. Physical and medical history was significant for a family history of heart disease, borderline diabetes, cigarette smoking, cholesterol of 262 and birth control pills. CK/CK-MB was normal. An EKG was abnormal. A “GI cocktail” was given with some relief. The ER physician diagnosed gastritis and discharged the patient with instructions to follow up with her primary care physician. She reported to her primary care physician the next day because of continued chest pain. Her primary care physician diagnosed esophageal reflux; however, due to a repeat abnormal EKG and her family history of heart disease, she was scheduled for stress echo testing the next day. The cardiologist read the stress echo test as normal, however, the patient experienced EKG T-wave inversions and her normal chest pain during testing. Later that afternoon, the patient went to her dentist to obtain relief of her jaw pain. Due to her condition, the dentist immediately sent her to the ER. She died enroute of a massive myocardial infarction. This case was settled for \$1,000,000.

## CASE TWO:

A 32-year-old female, eight days post partum, reported

new onset chest pain and pressure with back pain to her physician. She was diagnosed with a possible infection of her epidural site and prescribed Oxycontin for pain. Two days later, she reported weakness and severe chest pain like she had never experienced before. This was unrelieved by Oxycontin. BP was 189/110. The patient expressed fear that she was having a heart attack. She was diagnosed by telephone with heartburn and indigestion. Three days later, she telephoned her physician complaining of chest pain, shortness of breath, nausea and weakness of four hours duration. She was again diagnosed over the telephone with heartburn. Later that evening, she was taken to the ER in cardiac arrest. This case was settled for \$1,000,000.

## CASE THREE:

A 56-year-old post-menopausal female with a medical history significant for: goiter, hyperlipidemia, hypercholesterolemia and hypertension, was evaluated by her primary care physician for complaints of stomach pains, body aches, nausea, diarrhea, “hurts to breathe” and a “heavy” feeling in upper chest. She was diagnosed with a urinary tract infection. The patient telephoned two days later with worsening symptoms and was sent to the ER. In the ER, physical exam revealed

hypotension, tachycardia, chest splinting, bilateral rales, and a new systolic murmur. An EKG was abnormal. Laboratory results included: WBC 21.9, CPK 594 and CK-MB 34.1 (0-9.5). The CXR was abnormal showing cardiac decompensation, edema and consolidation. The patient was diagnosed with pneumonia and transferred to another facility for pulmonary management. On arrival at the second facility, the patient went into cardiopulmonary arrest and died. Autopsy revealed a massive posterior MI. The case was settled for \$700,000.

Each of these cases involves a physician’s failure to fully evaluate for possible cardiac disease and unstable angina despite the patient’s symptoms and EKG changes. Plaintiff’s experts in each case testified that the Standard of Care required a cardiology consult and admission for further cardiac workup and monitoring to rule out a possible cardiac cause. In Case One, experts cited the failure to admit for a cardiac evaluation when presented with the patient’s family history, recurrent episodes of chest and jaw pain, along with prolonged chest pain on treadmill—all classic for CAD. Case Two includes both a failure to perform EKG and cardiac isoenzymes, as well as a failure to ever examine the patient. Issues in Case Three involved a

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failure to diagnose and treat for MI in the ER despite abnormal EKG, CXR and lab work. Again, a cardiology consult was required in light of the patient's symptoms and initial test results. Physicians need to think CAD first and rule this out with an EKG and isoenzymes when making a diagnosis.

## Risk Management Suggestions

- Educate men and women as to their respective risk factors, warning signs and lifestyle modifications
- Take a complete history and physical
- Document all patient complaints relative to pain/pressure and its location
- Consider all risk factors including age, family history, lipids and cholesterol, diabetes, hypertension and smoking
- Perform an EKG immediately upon symptomatic presentation and document all EKG readings
- Compare the results of the present study to any previous studies performed

- Document completely and timely
- Document all recommendations for subsequent diagnostic tests and followup
- **Do not automatically rule out MI in younger patients and women**
- Do not abandon diagnostic pursuit because you are unimpressed by the results of diagnostic testing
- Promptly record any positive findings from diagnostic testing
- If clinical suspicion is present in spite of negative studies, recommend an exercise tolerance test
- **A patient presenting with ANY symptom suggestive of angina/MI should be evaluated, referred and/or admitted until a cardiac diagnosis has been ruled out**

For more information on CAD and prevention, visit:

[www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)  
[www.amwa-doc.org/education/heart\\_disease.htm](http://www.amwa-doc.org/education/heart_disease.htm)  
[www.americanheart.org](http://www.americanheart.org)  
[www.ama-assn.org](http://www.ama-assn.org) ●

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MAG Mutual does not presume to establish any standard of care or establish rules for the practice of medicine. The particular patient-care strategies or range of patient-care strategies mentioned in this newsletter should be tempered by the physician's judgment.

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