



Sex and Gender Differences in Chest Pain: Scenario Design Planning Notes

Education Problem Addressed by the Scenario:

Sex and gender differences in patient presentation for acute coronary syndrome (ACS).

Session Objectives:

1. State the differences in presentation for ACS that have been reported between male and female patients.
2. State the sex-specific differences in diagnosis and management that should be considered by the provider.

Performances expected from learners:

- The recognition of ACS in a female patient presenting with variable symptoms for ACS.
- State specific elements in diagnosis and management that should be considered in providing sex and gender specific management of ACS.

Learners:

Emergency medicine residents and medical students participating in simulation during their emergency medicine rotation or sex and gender in emergency medicine rotation. Also appropriate for nursing staff, EMS personnel, and students in nursing and EMS.

The patient:

54 year old (80 kg) female with a history of hypertension and diabetes who presents with one month of profound, constant fatigue, now with one week of burning in her epigastric area each time she ascends stairs.

Scenario:

Roles:

Primary provider: Resident or student assessing the patient

Attending provider: played by resident

ED RN: ideally played by a trained RN

Other stakeholders:

The patient's husband

On call Cardiology – available by phone only; capable of activating catheterization laboratory

Orientation:

This is a 54 year old (80 kg) female with a history of hypertension, GERD, and diabetes who presents with one month of profound, constant fatigue, now with one week of burning in her epigastric area each time she ascends stairs. She is accompanied by her husband who reports that his wife has been non-compliant with her GERD medication, and that the last time this happened, she had to be admitted because the ulcer 'burned through the wall of her stomach'.

EMS notes her vitals as follows: BP 145/85, HR 98 bpm, SpO2 96% on room air. EMS placed the patient on the monitor but provided no other interventions. She remained stable en route. Pain control was deferred, as the patient denied any pain in the ambulance.

Initial assessment:

ED RN: Assessment of vitals: HR 96, BP 145/80, SpO2 98% on room air, Temperature 98F. Monitor: Sinus tachycardia.

ED resident: Perform history and physical examination.

History: One month of profound fatigue, even at rest. No shortness of breath or chest pain, but describes a burning epigastric pain which occurs only when she walks upstairs or exerts herself.

PMH:

Diet-controlled hypertension

Diet-controlled GERD

Type II Diabetes

Meds: Metformin 1000 mg BID

Allergies: 'I try to avoid all over the counter pain pills, like aspirin or ibuprofen, because they always upset my acid reflux'.

Social: married, retired school teacher, smokes 5 cigarettes per day with a prior heavy smoking history of 1 pack per day for 25 years.

Family history: No family history of CAD, stroke, sudden death, or major GI issues.

ROS otherwise negative.

Examination:

- HEENT: Normal
- Lungs: Good chest rise and symmetric BS
- Heart: RRR, normal S1 and S2
- Abd: soft, non-tender
- Ext: notable for a tender, externally rotated and shortened right LE; distal pulses intact; normal distal sensation and able to move toes.
- Neuro: GCS 15

ED intervention:

Resident to take a full history and perform physical examination.

Resident to order work up for epigastric pain and generalized weakness: CBC, Metabolic profile with lipase and liver function testing, Coagulation studies, troponin, and consider CXR/AXR.

Resident to order and interpret initial ECG within 10 minutes of arrival as normal sinus rhythm.

Patient requests pain control. Resident to provide aspirin 324 mg by mouth, consider nitroglycerin, consider opioid medication.

ED resident to call for and interpret chest X ray (and or abdominal X ray) as normal.

Resident to order repeat ECG when patient complains of worsening fatigue, generalized weakness, and now states she is developing worsening severe nausea.

ED resident to interpret repeat ECG as STEMI.

ED resident to place stat page to Cardiology and discuss the patient's need for heart catheterization for STEMI.

Patient to heparinize patient and prepare patient for immediate transfer to heart catheterization laboratory.

End of scenario.

Scenario Logistics:



Location: ED resuscitation bay

Equipment:

Cardiac monitor with BP, HR, SpO2 monitoring
Simulation Mannikin with female voice, breasts, female clothing

Medications: morphine IV, ASA by mouth, heparin bolus IV, (resident may also order GI cocktail)

Supporting media:

ECG with normal sinus rhythm
ECG with STEMI
CXR/AXR normal
CBC, metabolic profile, coags – normal
Troponin 0.07 ng/mL

Main themes for debriefing:

Discussion of sex-differences in presentation for ischemic heart disease: only about 1/3 of females with ischemic heart disease experience chest pain as a symptom. Compared with males, females are more likely to complain of fatigue or generalized weakness during the month preceding their myocardial infarction. Females may also complain of other symptoms such as nausea, jaw pain, or shoulder pain.

When comparing female and male patients with diabetes, the risk of MI in females is two-fold higher than males.

When comparing female smokers to male smokers, smoking increases risk of CAD by 25% more in females compared to males.

Knowledge of sex/gender specific risk attribution by these risk factors is important in risk stratification of patients presenting to the ED in whom ischemic heart disease is on the differential diagnosis.

Overall mortality during hospitalization in patients admitted for MI is higher in females: 17% for females versus 12% for males.

Females with ACS have higher rates of cardiogenic shock, bleeding, and vascular complications.

In females with STEMI, percutaneous coronary intervention (PCI) is shown to be superior to fibrinolysis in reducing the incidence of sequelae of STEMI

Measurements of whether learners met objectives:

By the end of the simulation and debriefing session, learners must state the sex-differences in presentation, risk factors, and management for ischemic heart disease.

Debriefing Plan

Method:

- Group
- Video Review if available
- Reactions: “How did that feel?” “What do you think went well?”
- Plus/Delta “What went well” “What could have gone better” “What might have been different if the patient in this scenario was a male?”
- Advocacy/Inquiry “I noticed...” “It seems that it may be helpful to talk about this in more detail” “Many providers have trouble with this....”

Sample advocacy/inquiry questions:

1. I noticed that the patient did not receive aspirin in the pre-hospital setting, and that it took some time before ECG and aspirin were considered in the ED. What do you think might have gone better? Are there considerations for your future practice based on your experience today?
2. I noticed that the patient presented with variable complaints for STEMI – how do you think you might change your practice in terms of identification of female patients with possible cardiac disease, as well as risk stratification after this experience today?

Materials:

- Summary slides/outline/questions from chapter on sex differences acute care cardiology.

Name:
Case:
Faculty:

Critical Action Checklist

- | Yes | No | |
|-----------------------------|--------------------------|--------------------------------|
| 1) <input type="checkbox"/> | <input type="checkbox"/> | Assigned clear roles |
| 2) <input type="checkbox"/> | <input type="checkbox"/> | Used Closed-Loop Communication |
| 3) <input type="checkbox"/> | <input type="checkbox"/> | Reevaluate & Summarize |
| 4) <input type="checkbox"/> | <input type="checkbox"/> | Address parent concerns |

Dangerous Actions:

Failure to order ECG, aspirin, heparin, and consult Cardiology in a timely fashion.

Examiner Comments:

	Performance Rating							
	UNACCEPTABLE				ACCEPTABLE			
	1	2	3	4	5	6	7	8
Data Acquisition								
Problem Solving								
Patient Management								
Resource Utilization								
Care Provided Outcome								
Interpersonal Relationships								
Overall Clinical Competence								

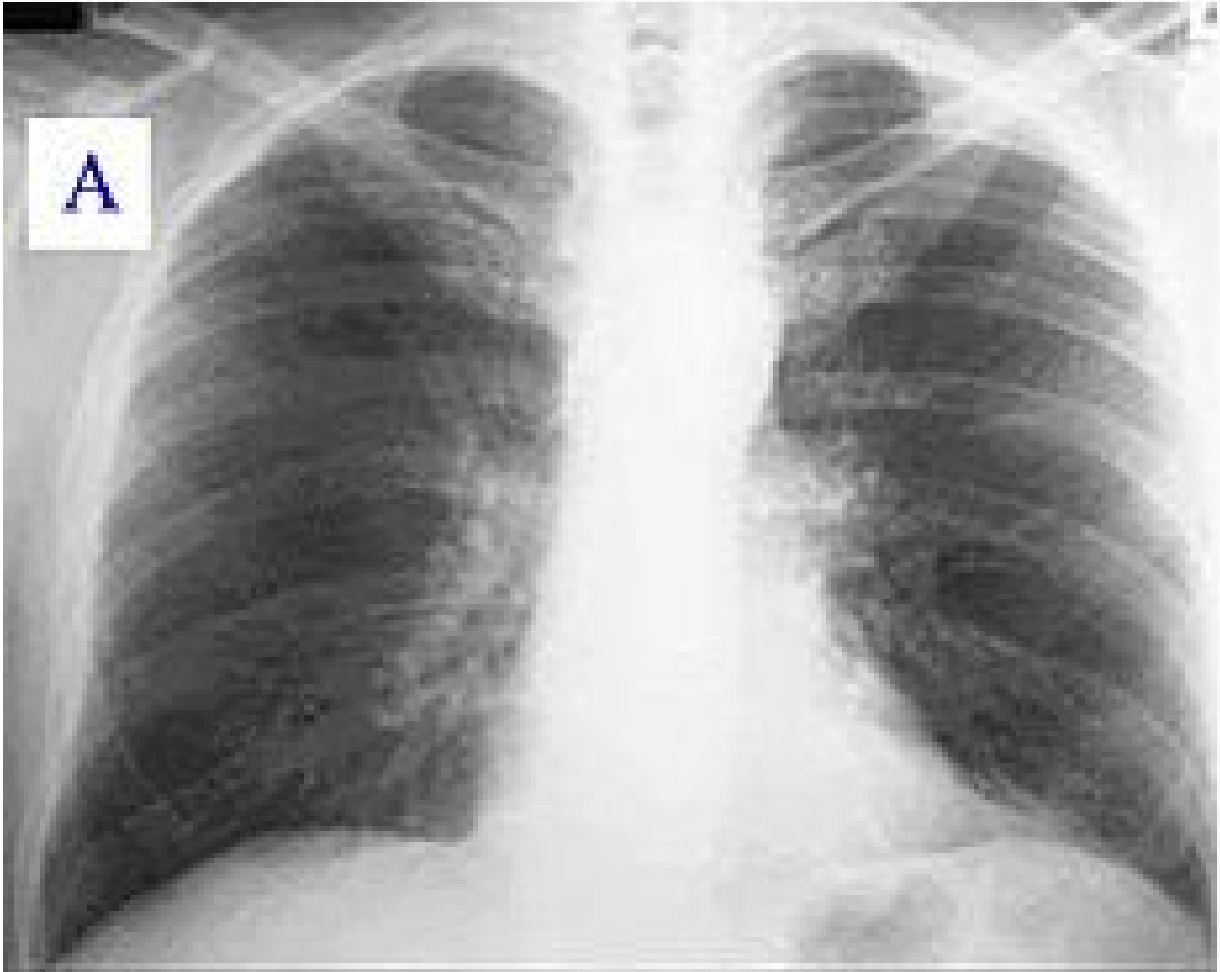
Case Specific Performance Criteria:

5 is Minimum Passing

- Data:** 5 or 6 Gets rapid key history → 3-4 Lengthy or inadequate history
- Problem Solving:** 5 or 6 Moves quickly through Hx/PE, consults Cardiology and initiates plan for rapid transfer to heart catheterization lab.
- Patient Management:** 5 or 6 Rapidly assesses patient’s history, including medications and allergies, and provides appropriate analgesia, as well as aspirin and heparin.
- Resource Use:** obtain consultations, mobilizes team for sedation/reduction
- Care Provided:** Was the clinical care appropriate for the diagnosis?
- Interpersonal:** Communicates clearly with patient by providing updates on plan and reassessing symptoms. Communicates clearly with colleagues regarding plan.
- Overall Competence:** Your overall impression of how the learner did.

Overall Score: (Avg. of 7 areas) =

Stimulus # 1 Normal CXR



Stimulus #2 – Laboratory results

Laboratory results (Normal range):

CBC

WBC	12,000/mm ³ (4500 –10,000/mm ³)
Hgb	12.5g/dL (Males 13.5-16.5 g/dL; Females 12.0-15.0 g/dL)
Hct	36% (Males 41-50%; Females 36-44%)
Platelets	115,000/mm ³ (100,000-450,000)
Segs	80% (54-62%)
Lymphs	9% (24-44%)
Monos	7% (3-6%)

Chemistry

Na+	135 mEq/L (135-147 mEq/L)
K+	4.0 mEq/L (3.5-5.2 mEq/L)
HCO ₃ ⁻	20 mEq/L (19-25 mEq/L)
Cl ⁻	104 mEq/L (95-107 mEq/L)
Glucose	162 mg/dL (60-110 mg/dL)
BUN	25 mg/dL (7-20 mg/dL)
Creatinine	1.1 mg/dL (0.5-1.4 mg/dL)

Urinalysis

Color	Yellow (Yellow: light pale to dark amber)
Sp Gravity	1.030 (1.005-1.025)
Glucose	Negative (< 130 mg/dL)
Protein	Negative (Negative)
Ketones	Negative (Negative)
LE	Negative (Negative)
Nitrites	Negative (Negative)
Leukocyte esterase	Negative (Negative)
WBC	0-2/HPF (< 2/HPF)
RBC	0-2/HPF (<2/HPF)
HCG	Negative (Negative)

Venous blood gas

pH	7.34 (7.32-7.42)
pCO ₂	34 mm/Hg (38-52 mm/Hg)

Liver panel

AST	35 U/L (8-48 U/L)
ALT	38 U/L (7-55 U/L)
Alk Phos	60 U/L (45-115 U/L)
T. Bili	0.8mg/dL (0.1-1.2 mg/dL)
Albumin	4.0g/dL (3.5-5.0 g/dL)
Protein	7.0g/dL 6.3-7.9 g/dL)

Lipase 70 U/L (0-160 U/L)

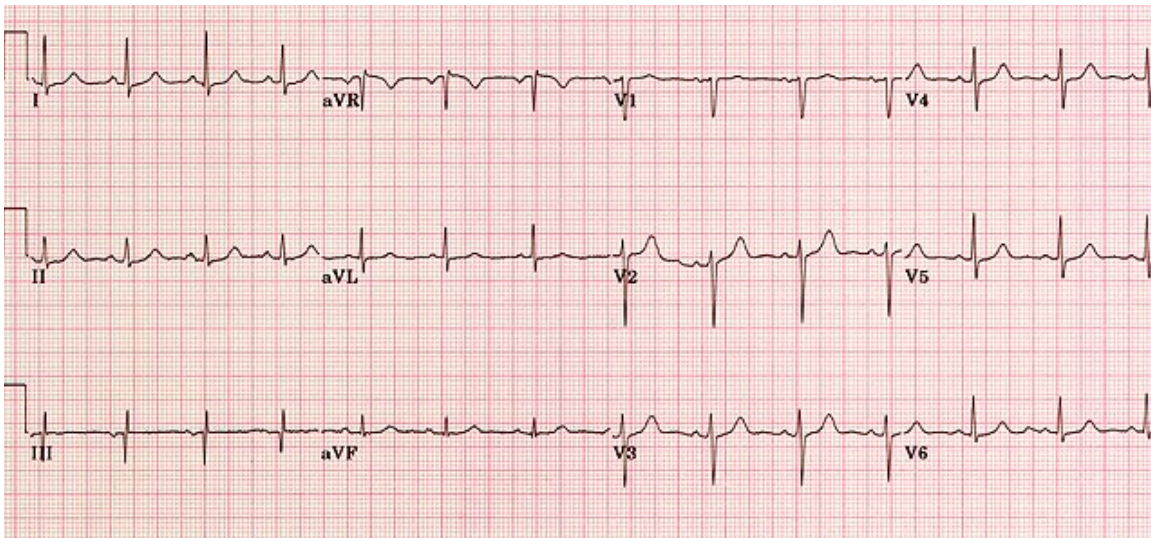
Coagulation Studies

INR 1.0 (0.8-1.2)

PTT 32 seconds (25-35 seconds)

Troponin I 0.07 ng/mL (less than 0.02 ng/mL)

ECG 1



ECG 2

