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CARDIOVASCULAR SEQUENCE

The Evaluation of Chest Pain

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Grants: NIH, Hewlett Foundation, Mardigian Foundation, Varbedian Fund, GORE

Consultant: NIH NHLBI
THE EVALUATION OF CHEST PAIN

Key Words: Angina pectoris, pericarditis, aortic dissection, differential diagnosis

Objectives:
1. To learn the differential diagnosis of chest pain.
2. To learn the key life threatening causes of chest pain.
3. To diagnose aortic dissection.
4. To become familiar with Bayes Theorem.
CAUSES OF RECURRENT CHEST PAIN

- Cardiac
- Gastrointestinal
- Musculoskeletal
- Aortic
- Pulmonary
- Psychologic
CARDIAC CHEST PAIN

- Angina Pectoris
- Retrosternal tightness
- Radiates to neck, jaw, shoulder or arms (L > R)
- Brought on by:
  - Exertion
  - Emotion
- Lasts minutes (1 - 10 min)
- Relieved by NTG or rest
- EKG: Transient STE or ST depression
CARDIAC CHEST PAIN

- Pericarditis
- Sharp pleuritic chest pain
- Worse lying; better sitting
- Friction rub heard on auscultation
- Lasts hours to days
- EKG: Typically PR depression and ST elevation
GASTROINTESTINAL CHEST PAIN

Gastroesophageal Reflux: (GERD)

- Retrosternal burning
- Precipitated by foods or supine position (night-time)
- Relieved by antacids, not NTG
Peptic Ulcer Disease:

- Epigastric ache or burning
- After meals, not exertional
- Gnawing pain at night
- Relieved by antacids, not NTG
GASTROINTESTINAL CHEST PAIN

Esophageal Spasm:

- Retrosternal pain and dysphagia
- Precipitated by meals
- Not exertional
- May be relieved by NTG
GASTROINTESTINAL CHEST PAIN

Biliary Colic:

- Constant deep RUQ pain
- Brought on by fatty foods, not exertion
- Not relieved by antacids or NTG
MUSCULOSKELETAL CHEST PAIN

Costrochondritis:

- Sternal pain worsened by chest movement
- Costrochondral junctions sensitive to palpitation
- Worse on left side
- Relieved by antiinflammatory agent or steroid injection
Cervical Radiculitis:

- Constant pain or shooting pains
- May be in dermatomal distribution
- Worsened by neck motion
AORTIC CHEST PAIN

Aortic Dissection:

- Sudden and severe at inception
- May be chest and/or back pain
- Pulse deficits or aortic valve insufficiency
Aortic Aneurysm:

- Deep steady pain located at site of pressure on musculoskeletal system
- May have cough, dysphagia, or other sx from local compression
PULMONARY CHEST PAIN

Pleurisy:

• Sharp pleuritic chest pain
• Worse lying; better sitting
• Pleural rub on exam
• Lasts hours or days
• Often with cough, respiratory infection
PULMONARY CHEST PAIN

Pulmonary Embolus:

- Sudden severe pain with SOB
- Pleuritic in nature
- Predisposition to venous clotting
- Hypoxia and tachycardia
PSYCHOLOGIC CHEST PAIN

Panic Disorder:

- Dull constricting ache with SOB
- Circumoral numbness or lightheadedness
- Recent unusual stress
- Recurrent episodes in healthy people
## Diagnostic Tests in Patients with Chest Pain

<table>
<thead>
<tr>
<th>Test</th>
<th>Target Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>EKG</td>
<td>• Myocardial ischemia</td>
</tr>
<tr>
<td></td>
<td>• Pericarditis</td>
</tr>
<tr>
<td>CXR</td>
<td>• Aortic dissection or aneurysm</td>
</tr>
<tr>
<td>Upper GI series or endoscopy</td>
<td>• GERD</td>
</tr>
<tr>
<td></td>
<td>• Ulcer</td>
</tr>
</tbody>
</table>
# Diagnostic Tests in Patients with Chest Pain

<table>
<thead>
<tr>
<th>Test</th>
<th>Target Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdomen ultrasound</td>
<td>• Gall stones</td>
</tr>
<tr>
<td>Chest CT or MRI</td>
<td>• Aortic disease</td>
</tr>
<tr>
<td>Esophageal motility</td>
<td>• Pulmonary embolus</td>
</tr>
<tr>
<td>VQ scan/CT Angio</td>
<td>• Esophageal spasm</td>
</tr>
<tr>
<td>Stress test/CT Angio</td>
<td>• Pulmonary embolus</td>
</tr>
<tr>
<td></td>
<td>• Angina</td>
</tr>
</tbody>
</table>
DIAGNOSTIC TESTS IN PATIENTS WITH CHEST PAIN

2 - D Echo

Transesophageal echo

• Pericardial fluid
• Aortic dissection
• Aortic dissection
APPLICATION OF DIAGNOSTIC TESTS

BAYE’S THEOREM

Pre test Probability → Test → Post test Probability
PROBABILITY OF MAJOR CAD IN PATIENTS WITH CHEST PAIN

<table>
<thead>
<tr>
<th>Age</th>
<th>No Sx M</th>
<th>No Sx F</th>
<th>Atypical Angina M</th>
<th>Atypical Angina F</th>
<th>Typical Angina M</th>
<th>Typical Angina F</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 - 44</td>
<td>1.9</td>
<td>0.3</td>
<td>21.8</td>
<td>4.2</td>
<td>69.7</td>
<td>25.8</td>
</tr>
<tr>
<td>45 - 54</td>
<td>5.5</td>
<td>1.0</td>
<td>46.1</td>
<td>13.3</td>
<td>87.3</td>
<td>55.2</td>
</tr>
<tr>
<td>55 - 64</td>
<td>9.7</td>
<td>3.2</td>
<td>58.9</td>
<td>32.4</td>
<td>92.0</td>
<td>79.4</td>
</tr>
<tr>
<td>&gt; 65</td>
<td>12.3</td>
<td>7.5</td>
<td>67.1</td>
<td>54.4</td>
<td>94.3</td>
<td>90.6</td>
</tr>
</tbody>
</table>

- All numbers reflect percentages
- NEJM 1979; 300; 1350-1358