CHEST PAIN CENTER

Acute Coronary Syndrome Education for RNs
Objectives

- Understand the goals and purpose of our Chest Pain Center (CPC)
- Develop understanding of:
  - Risk factors for MI (heart attack)
  - Pathophysiology of Acute Coronary Syndrome (ACS)
  - Signs & Symptoms, Early recognition & interventions
  - Atypical presentations, including differences in age & gender
  - Typical dysrhythmias in MI
  - Cardiac biomarkers (lab work)
  - Guidelines for stress testing
  - Process for initiating code STEMI
  - Treatment of ACS
Purpose & Goals of CPC Program

- Adherence to current evidence-based guidelines in the care of the ACS patient
- Focus on ACS patients across the continuum
- Assess the processes related to diagnosing and treating the ACS patient
- Advocate for and allocate resources for the ACS patient
- Evaluate clinical care management, analyze performance/process metrics, analyze key outcomes metrics and oversee process improvement initiatives for the ACS patient
Risk Factors for Heart Disease

<table>
<thead>
<tr>
<th>Major independent risk factors</th>
<th>Predisposing risk factors</th>
<th>Possible risk factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarette smoking</td>
<td>Physical inactivity</td>
<td>Fibrinogen</td>
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<tr>
<td>Hypertension</td>
<td>Obesity</td>
<td>C-reactive protein</td>
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<tr>
<td>Elevated total and LDL cholesterol</td>
<td>Family history of premature coronary disease</td>
<td>Homocysteine</td>
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<tr>
<td>Low HDL cholesterol</td>
<td>Ethnicity</td>
<td>Elevated Lp(a)</td>
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<tr>
<td>Diabetes mellitus</td>
<td>Psychosocial factors</td>
<td></td>
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<tr>
<td>Older age</td>
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- American Heart Association guide to risk factors for coronary artery disease.
- Resource: “Cardiology explained”
Acute Coronary Syndrome

- ACS is a term used to describe the spectrum of acute coronary artery disease such as:
  - Unstable Angina
  - Non ST-elevation MI (NSTEMI)
  - ST segment elevation MI (STEMI)
Pathophysiology of ACS

- Coronary Artery Disease (CAD):
  - atherosclerotic plaques, called atheromas or “lesions”
  - block coronary artery blood flow.
- ↓ Heart’s Supply of
  - Oxygen
  - Nutrients
Concepts of Myocardial O₂ Supply and Demand
- ↑ demands (WORK) exceed supply (Blood Flow or O²)
- Imbalance leads to myocardial ischemia.

Effects of Ischemia
- Heart failure
- Arrhythmias
Early Signs and Symptoms of ACS (MI or Heart Attack)

- **Pressure**
  - fullness, squeezing, or pain in the center of the chest lasting several minutes (usually more than 15 minutes)

- **Pain**
  - spreading to the shoulders, neck, arms, or jaw, or pain in the back or between the shoulder blades

- **Other symptoms:**
  - weakness, dizziness, sweating, N/V, uneasiness, dyspnea
  - distress, anxiety, or impending doom
WOMEN

Don’t always show typical heart attack symptoms.

- Shortness of Breath
- abdominal discomfort
- unusual fatigue, sometimes extreme w/o exercise.
Common in men & women:
- Crushing chest pain
- Cold and profuse sweating
- Nausea
- Pain radiating to neck or left arm
- Sudden onset of symptoms

Common in women:
- Profound sense of fatigue
- Shortness of breath
- Flu-like discomfort
- Feeling of indigestion, heartburn
- Symptoms for a number of days

Heart attack symptoms
Age is the number 1 risk factor for heart disease.

Heart disease is a leading cause of death in people over the age of 65.

Aging causes:
- Heart walls, particularly the left ventricle, get thicker.
- Heart rate changes
- Heart muscle cells deteriorate.
- Abnormal heart rhythms (atrial fibrillation)
- Heart valves may thicken or leak.
Age related symptoms of ACS

- In elderly symptoms are:
  - less frequent and may be non-existent.
- ECG - shows fewer clues
Diagnostic for location of MI
Place leads PROPERLY.

Position of the V leads (chest leads)
V1 - 4th ICS, RSB
V2 - 4th ICS, LSB
V3 - between V2 and 4
V4 - 5th ICS, L MCL
V5 - 5th ICS, L Ax Line
V6 - 5th ICS, L Mid Ax Line
The normal 12 lead EKG
Purpose of the 12-lead EKG

- To detect ischemia or acute coronary injury.
Why do we need one?
- To rule out Right Ventricular infarct
- MD may order
- Used infrequently
Major Dysrhythmias in MI

SVT: Supraventricular Tachycardia  (rate too fast)

Heart Blocks  (rate too slow)
Ventricular Arrhythmias are Common and can result in Sudden Death. These are LETHAL rhythms!!

- V-Tach
- Torsades
- V-Fib
Other Lethal Rhythms

Idioventricular Rhythm (may or may NOT have pulse)

Asystole (NO PULSE)
Common Labs in Diagnosis MI

- **Cardiac Biomarkers**
  (Lab results indicating a patient is having a MI)

- **Cardiac Proteins**
  - Troponin is specific to myocardial injury and rise quickly after injury

- **Cardiac Enzymes**
  - Enzymes specific to cardiac muscle that are released into the blood stream when tissue dies.
    - CPK - MB  Rises in 2-4 hours, peaks in 12-20 hours and returns to normal 48 - 72 hours later.
    - LDH  Rises in 24 hours, Peaks in 48-72 hours and returns to normal in 7-10 days.
Exercise Stress test
- Easiest
- Must be able to exercise
- Must be able to evaluate ST baseline on EKG

Pharmacologic imaging study
- Pts unable to exercise

Exercise imaging for:
- baseline ST abnormalities
- BBB
- LV hypertrophy
- intra-ventricular conduction defect
- paced rhythm
- digoxin
IF you suspect your patient is having a MI....

Think H.E.A.R.T.
- H - Help (call Quick team, MD, House Coordinator)
- E - EKG STAT
- A - Activate Inpatient STEMI order set
- R - Reperfusion
- T - Transport to the Cath Lab
Is MY PATIENT having an MI???

Do they have:
- New Arrhythmias?
- c/o chest pain?
- ST elevation on tele?
- Change in cardiac rhythm?

CONSIDER MI!!

- Chest discomfort
- Arm or back discomfort
- Neck or jaw discomfort
- Trouble breathing, with or without chest discomfort
- Feeling light-headed or breaking into a cold sweat
- Feeling sick or discomfort in your stomach

The Baseline of the ECG

Notice the baseline is elevated. This is seen on the ECG of someone suffering a “STEMI” heart attack.
Some patients (elderly, diabetics, women, etc.) will not complain of chest pain. They may have less “classic” symptoms. Don’t IGNORE IT. GET HELP!!!
Resource: Call the QUICK team

- The Quick Team will help assess the situation and initiate the Code STEMI process.
- Order and obtain a STAT 12 lead EKG
- If it is felt the patient may be having a STEMI, call 3-6511 to activate the STEMI team.
If a cardiologist is on the case, call them.

If no cardiologist, call the attending:
- I am calling about ____ in room ___.
- He/she is having the following symptoms: (describe)
- We are obtaining a 12 lead EKG.
- Would you like me to fax it to you to read or would you like for me to get the in house physician to read? (10 minutes to read the EKG)

If there is no Cardiologist on the case ask:
- If the patient is having a STEMI, do you want me to call the Cardiologist on call for STEMI or do you have a preference in which Cardiologist is called?
Implementing Code STEMI

- Notify the House Coordinator
  - assess & facilitate implementation of Code STEMI
- Activate Inpatient STEMI Order Set as ordered
  - Implement orders (labs, meds, prep etc)
- Assist with transport to Cath Lab
  - Remember to transport on EKG monitor!
- GOAL: Get patient to Cath Lab in under 90 minutes!!
Medications for Acute MI

- **Morphine**
  - for pain and decreases myocardial oxygen needs.
- **Oxygen**
  - to provide adequate oxygen to tissues.
- **Nitroglycerine**
  - to dilate coronary arteries and promote blood flow.
- **Aspirin**
  - decreases blood clotting and improves flow.
Surgery / Procedures

- Stent and Angioplasty –
  - A catheter is passed to the narrowed / closed cardiac blood vessel
  - A balloon is inflated, compressing the plaques against the artery walls.
  - A stent (or prop) is left in the artery to keep the artery open.
Treatment of ACS

- CABG – Coronary Artery Bypass Graft
  - Surgical Procedure: grafts are sewn onto the coronary arteries to bypass the narrowed area.
The sooner you act, the more cardiac muscle you save!

The more cardiac muscle lost results in increased disability and possibly death for the patient!

Remember, ACT FAST!

TRUST YOUR INSTINCTS!!

It is always best to ask for help and not need it than to need it and never ask for it!!
CLICK THE LINK BELOW FOR THE ASSESSMENT TEST

Chest Pain Center Annual Education Test

When the test is successfully completed (score 100%), you’ll be prompted to supply your name, API# and the last four digits of your social security number.