Dignity Health
Acute Coronary Syndromes & Early Heart Attack Care for RN

This Module will take 15 minutes to complete

2017

Acute Coronary Syndromes

Why Do I Have to Read this Lesson?

- Your health and the health of your family is important to Dignity Health
- It is vital that everyone employed with Dignity Health knows what to do if a patient, visitor, or employee develops chest pain
- Please take a few minutes to read the module and acknowledge the content

Acute Coronary Syndromes

Goals and Purpose of Chest Pain Center Accreditation

- Accreditation ensures that a Chest Pain Center meets or exceeds measures to save lives of those with chest pain (Acute Coronary Syndromes)
- Accreditation provides a comprehensive approach to treatment
- Accreditation requires a streamlined, targeted approach for diagnosis, treatment, and care

Acute Coronary Syndromes

Objectives

- Define importance of chest pain center accreditation
- Discuss etiology of Acute Coronary Syndromes
- Discuss assessment, medical therapies, and nursing interventions appropriate for Acute Coronary Syndromes

Acute Coronary Syndromes

Chest Pain: Is it Acute Coronary Syndrome?

- Chest pain may have many different causes

Some Cardiac Chest Pain Conditions

- Aortic Valve Disease
- Mitral Valve Prolapse
- Aortic Dissection
- Thoracic Aortic Aneurysm
- Myocarditis/Pericarditis
- Cardiomyopathy
- MI/ACS

Some Non – Cardiac Chest Pain Conditions

- Costochondritis
- Pneumonia
- Pneumothorax
- GI Disorders
- Laparoscopic Procedures
- Pulmonary Embolism

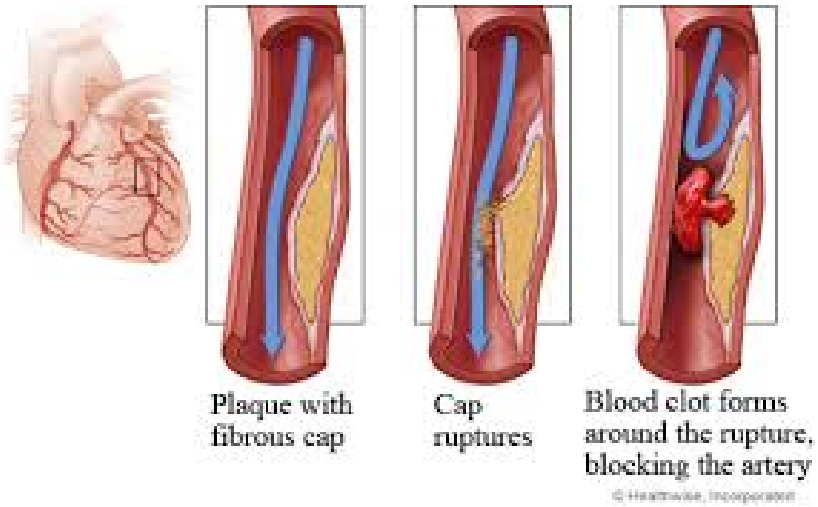
Acute Coronary Syndromes

What is Acute Coronary Syndrome (ACS)?

- Acute Coronary Syndrome is a broad term used for any condition brought on by sudden, reduced blood flow to the heart
- Some of the 'terms' used to explain ACS may include the following:
  - Unstable Angina [UA]
  - ST Segment Depression, T wave inversion
  - Non ST Segment Elevation MI (Non-STEMI)
  - ST Segment Elevation MI [STEMI]
  - New Left Bundle Branch Block (STEMI)

Acute Coronary Syndromes

- **Chest pain** may be caused by an imbalance between supply and demand of myocardial oxygen
- This imbalance occurs in the heart when coronary arteries narrow, often times due to the buildup of plaque
- Ischemia occurs when the heart muscle does not get needed oxygen and nutrients
- When a plaque ruptures within the artery, a blood clot forms around it, which can block blood flow to the heart muscle
- If blood flow is not restored, the affected heart muscle may become permanently damaged or die
- Myocardial infarction (Heart Attack) means “death of muscle”



- Coronary artery occlusion leads to ischemia, injury and myocardial cell death, which may cause QRS, T wave, and ST segment changes on the EKG

Acute Coronary Syndromes

Typical Signs and Symptoms

- Squeezing chest pain or pressure
- Jaw pain
- Shortness of breath
- Sweating
- Nausea, heartburn, or indigestion
- Lightheadedness
- Palpitations
- Pain/numbness radiating to the left arm/shoulder

Acute Coronary Syndromes

In addition to the "**Classic" Chest Pain Signs and Symptoms**, women and the elderly (those older than 70) may have additional symptoms.

Symptoms more likely in Women

- Indigestion or gas like pain
- Dizziness, nausea, or vomiting
- Unexplained weakness or fatigue
- Discomfort/pain between the shoulder blades
- Recurring chest discomfort
- Sense of impending doom

Symptoms more likely in the Elderly

- Shortness of breath
- Fatigue
- Palpitations
- Chest Pain
- Dizziness

Acute Coronary Syndromes

People with **Diabetes** may also have unusual and vague symptoms of chest pain/heart attack

- No chest pain
- **Atypical** chest pain:
  - Dizziness
  - Weakness
  - Back pain
  - Neck pain
  - Shoulder pain
  - Abdominal pain
  - Unexplained shortness of breath
  - Nausea
  - Weakness
  - Sweating

Acute Coronary Syndromes

HEART DISEASE is the top killer of men & women

Risk Factors	Risk Factors
Male Gender	High Blood Pressure
Older than 65	Smoking
Diabetes	Too much fat in one's diet
Family History of Heart Disease	High cholesterol levels
Renal Disease	Overweight/Obesity
Physical Inactivity	Previous heart attack, bypass surgery, stroke, arterial disease

Acute Coronary Syndromes

Risk factors we CANNOT control:

- Family History
- Age
- Gender
  - men > risk than women
- Race

- **Risk factors we CAN control**
- Hypertension
- High Cholesterol
- Diabetes
- Smoking
- Obesity or Overweight
- Physical Inactivity

We can't change our family genetics or our age but… we can modify our lifestyle to manage or eliminate the other contributing risk factors.

Acute Coronary Syndromes

Quit Smoking

- Quitting smoking is often a difficult lifestyle change
- There are many resources to help people quit but one has to be an active, willing participant.
- Some resources to help quit include:
  - Smoker's Helpline *1-800-55-66-222 or* via web: www.Ashline.org
  - Local area tobacco use prevention programs
  - American Lung Association
  - Employee Health

Acute Coronary Syndromes

Take steps to reduce your risk of a heart attack

- Daily walk
- Weight loss
- Quit smoking
- See your doctor for high blood pressure
- See your doctor for diabetes
- Control risk factors

Chest Pain Survival

- Learn the heart attack warning signs
- Think through what you would do if you have heart attack warning signs
- Talk with your family and friends about the heart attack warning signs and the importance of calling 9-1-1
- Talk to your doctor about your risk of a heart attack

Acute Coronary Syndromes

What is Early Heart Attack Care (EHAC)?

- **E**arly **H**eart **A**ttack **C**are is an effort to educate the public about the warning signs of a heart attack
- Prompt recognition of these early warning signs can prevent a major cardiac event from occurring by teaching people to seek treatment as soon as they experience symptoms

Acute Coronary Syndromes

Heart Attack Recognition

- Many people with heart attacks are not getting the care that they need and require for their cardiac event
- Why? Many people delay seeking treatment when their symptoms begin, or don't recognize the symptoms

Acute Coronary Syndromes

Why do people delay treatment?

- They “don’t have time to be sick”
- They are embarrassed or “don’t want to bother anyone”
- They brush it off as heartburn and take medicine
- They feel too healthy and strong to be sick
- They wait for the symptoms to go away

Acute Coronary Syndromes

If <u>at home</u>:
What should you do if you encounter someone who has any of the early symptoms of a heart attack…

DON'T DELAY Call 9-1-1

- Get family members/others to help
- Be persistent and patient - continue to encourage them to seek treatment
- If all else fails, take charge and get them to medical treatment

Acute Coronary Syndromes

If at work:
What should you do if you encounter a visitor or a co-worker who has any of the early symptoms of a heart attack…

- If stable, take the visitor/co-worker immediately to the Emergency Department by wheelchair – (do NOT let them walk) or follow your facility specific policy/protocol
- If unstable, follow your facility specific policy
- Stay with the visitor/co-worker and provide comfort until you are relieved by a clinical staff member

Acute Coronary Syndromes

If at work: what should you do if you encounter a patient who has any of the early symptoms of a heart attack…

- *Follow facility specific policies/protocols* related to Chest Pain, Chest Pain order set, CRT/RRT, Code STEMI
- Call a Rapid Response Team / Clinical Response Team for assistance - ***Refer to your local hospital policy***
- Stay with the patient
- Complete a chest pain assessment, history & physical as defined by your scope of practice
- Call attending provider
- Obtain vitals and cardiac monitoring

Acute Coronary Syndromes

American Heart Association Guidelines 2015:

Chest Pain suggestive of Ischemia

Emergency Department Initial Assessment:

- Check vital signs; evaluate O2 sat.
- Establish (verify) IV access
- Perform targeted history, physical exam
- Heart Score, CT of coronary arteries/Calcium score as appropriate
- Review/complete fibrinolytic checklist
- Obtain initial cardiac markers, electrolyte, & coagulation marker levels
- Obtain CXR

Emergency Department Initial Treatment:

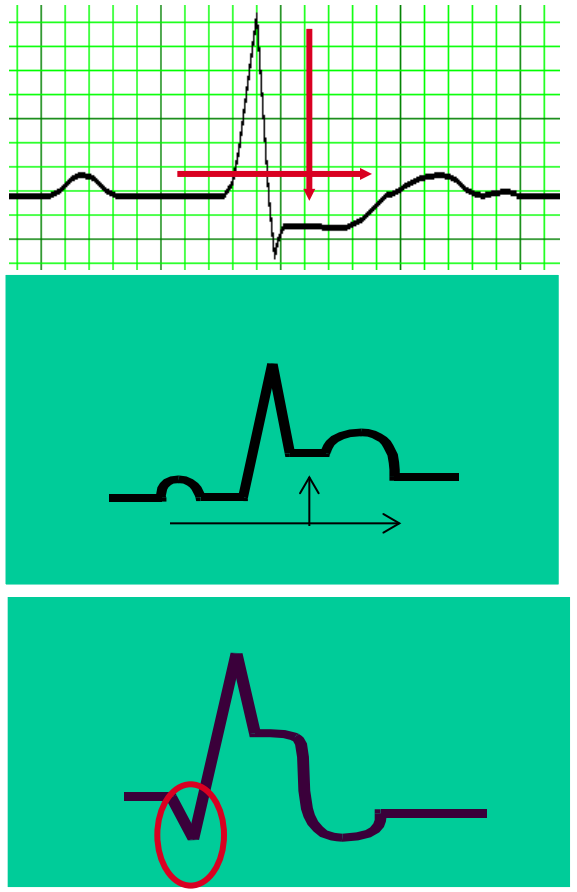
- If O2 sat < 90%, O2 at 4L/min
- ASA 160 – 325 mg
- Nitroglycerin
- Morphine IV if discomfort not relieved by NTG

Acute Coronary Syndromes

- All patients with chest pain determined to be ischemic in nature will receive a 12 lead EKG
- Patients will be placed into categories based on the results of the 12 Lead, the patient history, and presenting signs & symptoms
  - ST Segment Elevation/New Left Bundle Branch Block (STEMI)
  - ST Segment Depression/T wave Inversion (Some patients may be classified as Non-STEMI)
  - Non-diagnostic changes or normal 12 lead (Some patients may be classified as Non-STEMI)

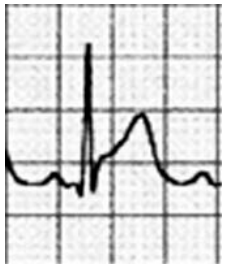
Acute Coronary Syndromes

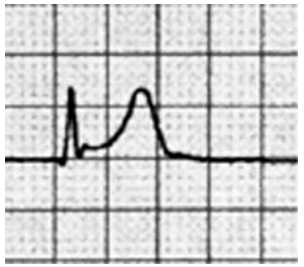
- Ischemia
  - lack of oxygenation
  - **ST depression or T inversion**
- Injury
  - prolonged ischemia
  - **ST elevation**
- Infarct
  - death of tissue
  - **may or may not show in Q wave**

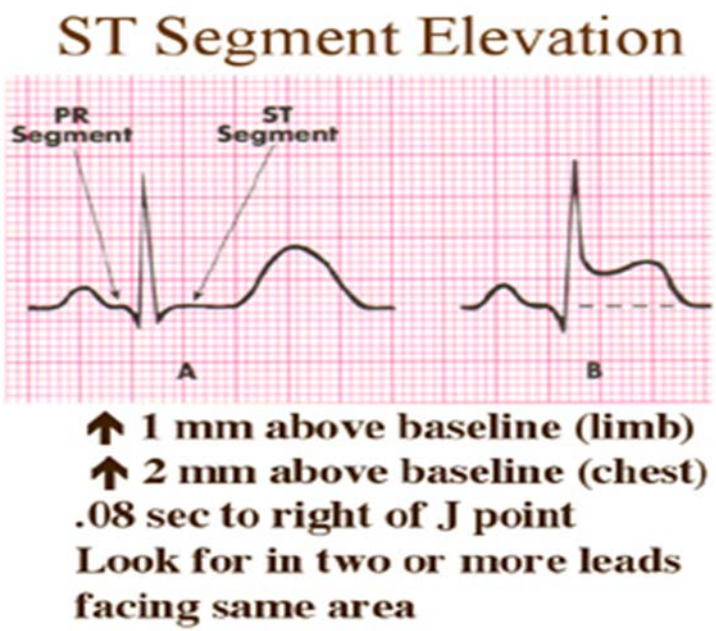


Acute Coronary Syndromes

- ST elevation
  - Presumptive evidence of AMI
  - Indication for acute reperfusion therapy
- ≥ 1 small square on EKG paper
- Evident in at least TWO contiguous leads



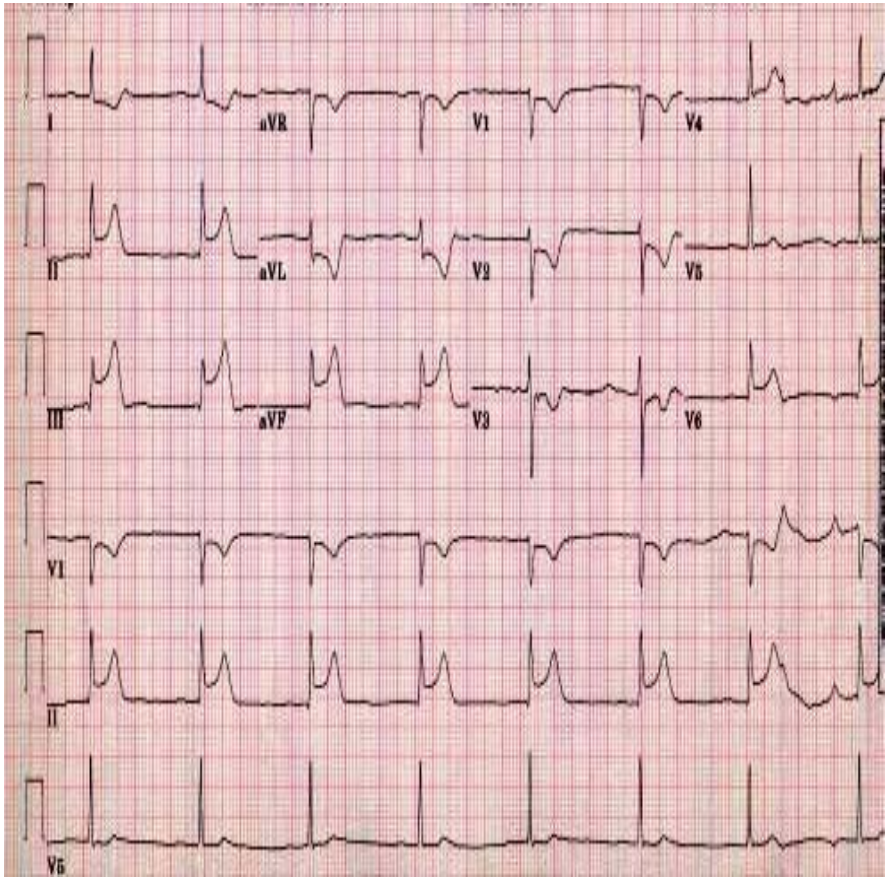




Acute Coronary Syndromes

ST Segment Elevation/New Left BBB (STEMI)

- The 12 lead on the right demonstrates **ST Segment elevation** in Leads II, III, AVF suggestive of right coronary artery/inferior wall involvement
- If the 12 lead demonstrates **inferior wall changes** (II, II, AVF) then the staff will consult with the provider and request a **right-sided 12 lead** from the EKG technician



Acute Coronary Syndromes

ST Segment Elevation/New Left BBB (STEMI)

American Heart Association guidelines call for reperfusion goals of:

- **Percutaneous coronary intervention** (PCI) with a door to balloon goal of 90 minutes (cardiac catheterization).
  - Some facilities within Dignity Health have a more narrow time frame. Please follow facility specific protocols

- **Fibrinolysis** with a goal of 30 minutes
  - Clot buster such as tPA

Acute Coronary Syndromes

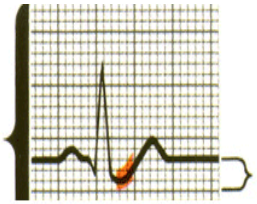
ST Segment Elevation/New Left BBB (STEMI)

After perfusion through the coronary artery is re-established, adjunctive therapies are prescribed. Therapies may differ for each patient based on history and current medical condition

- ASA daily
- IV Nitroglycerin
- Thienopyridines: (i.e. Plavix)
- Beta Blockers
- LDL drawn within 24 hours if > 100 statin must be prescribed
- Measurement of ejection fraction
- ACEIs/ARBs
- IV Heparin
- Glycoprotein IIb/IIIa inhibitors (i.e. Integrilin)
- Smoking Cessation
- Cardiac Rehabilitation
- Cardiac Education

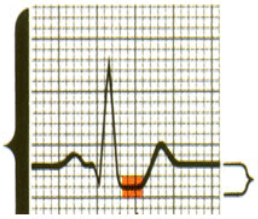
Acute Coronary Syndromes

ST Segment Depression/T Wave Inversion

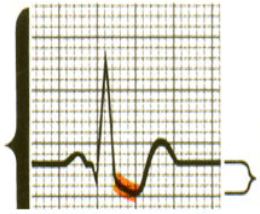


Types of ST Depression
AHA Criteria

Upsloping
≥ 1 mm (0.08 sec after QRS)
30% to 40% error rate



Horizontal
≥ 1 mm (0.08 sec after QRS)
Very low error rate



Downsloping
≥ 1 mm (0.08 sec after QRS)
5% to 10% error rate

Those patients with elevated Troponin levels (cardiac enzymes) or at high risk may be considered Non-STEMI and also benefit from cardiac catheterization.

Those patients not at high risk or with negative cardiac enzymes may be admitted to a monitored bed.
Assess risk status.

Continue ASA, heparin, and other adjunctive therapies as indicated.

Continue to assess 12 lead, cardiac enzymes. Troponins are repeated every 6 hours or per facility protocol.

Acute Coronary Syndromes

Cardiac Biomarkers

- There are several cardiac biomarkers that aide in making a diagnosis, with Troponin being the most cardiac specific
- Troponin is a protein released into the blood stream from heart muscle when it is damaged. It is highly specific to cardiac tissue and can assist with diagnosing a heart attack
- Troponin is measured in set intervals - ***every 6 hours***, to watch for a trend and peak
- Levels increase within 3-12 hours from the onset of chest pain, peak at 24-48 hours, and return to baseline over 5-14 days

Acute Coronary Syndromes

Nondiagnostic changes or Normal 12 lead

The patient with chest pain may demonstrate a normal 12 lead

OR

The patient may be admitted and monitored for changes in 12 lead, changes in cardiac enzymes, changes in clinical status

If at high-risk they may benefit from cardiac catheterization and appropriate adjunctive therapies

OR

The patient may be observed for 12 – 24 hours & if no further chest pain, no changes in 12 lead, and negative enzymes, may be discharged

Acute Coronary Syndromes

Stress Testing

- The 2014 American College of Cardiology / American Heart Association guidelines state, “It is reasonable for patients with possible ACS who have normal serial EKGs and cardiac troponins to have a treadmill EKG, stress myocardial perfusion imaging (“stress test”), or stress echo before discharge or within 72 hours after discharge.”
- These tests will help to detect if patients require further testing, such as a heart catheterization.
- The importance of this follow-up exam should be emphasized with patient education and when discharging patients.

References

- American Heart Association. **Advanced Cardiovascular Life Support.** 2015 Guidelines
- Roger VL, Go AS, Lloyd-Jones DM, et al. American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics—2012 update: a report from the American Heart Association. *Circulation. 2012;125(1):e2–e220.*
- Wells M, Kalman M. Women & heart disease: symptoms and treatment guidelines. *Nurse Practitioner. 2011;36(9):22–27.*
- King, Joan E. PhD, ACNP-BC, ANP-BC; Magdic, Kathy S. DNP, ACNP-BC. Chest Pain: A Time for Concern? *ACCN Advanced Critical Care.* 25(3): 279-283, July/September 2014.
- American Association of Critical Care Nurses (AACN). (2009). AACN practice alert: ST segment monitoring. Retrieved March 3, 2014, from http://www.aacn.org/wd/practice/docs/practicealerts/st-segment-monitoring.pdf?menu=aboutus
- Swenson, D.J. and others. (2011). Cardiac position sensitivity study in the electrocardiographic forward problem using stochastic collocation and boundary element methods. *Annals of Biomedical Engineering, 39*(12), 2900-2910. doi:10.1007/s10439-011-0391-5
- 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 2014; Sept 23

Thank You

You have completed the information portion of the lesson.

You must pass the post-test to successfully complete this activity.

Dignity Health