Advanced Cardiovascular Life Support Course

Acute Coronary Syndrome (ACS) Overview

Acute Coronary Syndrome (ACS) includes:
- Unstable angina; and
- Acute Myocardial Infarction (AMI)-**AMI is associated with STEMI or NSTEMI and treatment is likely to differ upon diagnosis**

Signs and symptoms associated with ACS, including Acute Myocardial Infarction (AMI):
- Uncomfortable chest pressure, fullness, squeezing, or pain in the center of the chest;
- Pain spreading to the shoulders, neck, arms or jaw or pain in the back or between the shoulder blades;
- Chest discomfort with lightheadedness, fainting, sweating and/or nausea; and
- Shortness of breath with or without chest discomfort
- Feeling of impending doom

Primary goals of therapy for patients with ACS:
- Reduce the amount of myocardial necrosis that occurs in patients with AMI;
- Prevent Major Adverse Cardiac Events (MACE): Death, Non-fatal MI, and the need for revascularization; and
- Treat acute, life-threatening complications such as ventricular fibrillation, pulseless ventricular tachycardia, symptomatic/unstable bradycardia and symptomatic/unstable tachycardia;
Underlying, life-threatening causes of chest discomfort include:
• Aortic dissection;
• Pulmonary embolism;
• Acute pericarditis with effusion and tamponade; and
• Tension pneumothorax

Immediate Assessment and Treatment for ACS include:
• Oxygen therapy, maintaining 02 Saturation of 94%-99%;
• ECG Monitor;
• Aspirin, Nitroglycerine and Morphine if indicated;
• 12-lead ECG with interpretation;
• Perform focused history and physical exam;
• Assess vital signs;
• Establish IV/IO access; and
• Obtain initial cardiac markers and portable x-ray

Diagnosis-specific Treatment:
STEMI
– Begin adjunctive therapies with no delay in reperfusion
– If time from onset is <12 hrs, initiate reperfusion strategies:
  • Door-to-balloon inflation (PCI) goal of 90 minutes
  • Door-to-needle (fibrinolysis) goal of 30 minutes

Inpatient STEMI
• Associated with higher mortality
• More frequently missed
• Inpatients have more atypical s/sx due to their comorbidities and medications (i.e. opioids)
• At UNCH, any EKG that reads “ACUTE MI”, “STEMI”, or “Infarct, Possible” must be read by a cardiology fellow or attending.
  – Activate a Cardiac Response Team (direct page in ICUs, activated by Rapid Response Consult Nurse in stepdowns)
Prehospital ROSC – Potential STEMI

- Any out-of-hospital cardiac arrest patient who achieves ROSC must be transported to a facility that can perform an emergent PCI (percutaneous coronary intervention).

- This allows for STEMI treatment to be quickly initiated if a STEMI was the cause of the initial arrest.

- Reperfusion therapy reduces mortality and saves heart muscle. The shorter the time the greater the benefit.

Non-STEMI but has ST depression or T-Wave Inversion

- Assess if Troponin is elevated or patient is high risk; and

- Consider early invasive strategy if:
  - Refractory ischemic chest discomfort
  - Recurrent ST deviation
  - Ventricular Tachycardia
  - Hemodynamic instability
  - Signs of heart failure

ACS

- Consider admission to chest pain unit or appropriate bed and continue:
  - Serial cardiac markers;
  - Repeat 12-lead ECG/ST-segment monitoring; and
  - Non-invasive diagnostic testing

Contraindication to Fibrinolytic therapy:

- Systolic BP > 180-200 or diastolic BP > 100-110;
- Right vs. left arm systolic BP difference > 15 mm Hg;
- History of CNS disease;
- Significant closed head/ facial trauma within 3 weeks;
- Stroke > 3 hours or < 3 months;
- Recent (2-4 weeks) major trauma, surgery, GI/GU bleed;
- History of intracranial hemorrhage;
- Pregnant; or
- Serious systemic disease
**High Risk for Fibrinolytic Therapy**

- Heart rate > 100/min AND systolic BP < 100 mm Hg;
- Pulmonary edema;
- Signs of shock;
- Cardiac Arrest; or
- Patient meets any previously mentioned contraindications to fibrinolytic therapy

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**ACS Initial Treatment / Medication Review**

**Nitroglycerine**

- 0.4 mg Sublingual tablet or spray
- Contraindicated if Viagra/Revatio (Sildenafil Citrate), or Levitra (Vardenafil Hydrochloride) taken within the past 24 hours or Cialis/Adcirca (Tadalafil) taken with the past 48 hours
- Should be administered following 12-lead ECG with interpretation, if possible
- Contraindicated if the systolic BP < 90 mm Hg

**Aspirin**

- 160-325 mg PO
- Should be administered upon onset of symptoms and may be combined with prescribed blood thinner medications

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**Oxygen**

- Begin at 4 lpm and titrate, maintaining oxygen saturation of > 90% or to relieve shortness of breath

**Morphine**

- Dosing is 2 – 4 mg IV for pain management
REMEMBER TIME IS BRAIN – do not delay calling 911.

EMS would rather respond and not transport if there is really no problem than have a delayed response!!!!

Signs and symptoms associated with Stroke:

- Altered Mental Status (confusion or just the inability to say what they want to say although they have total understanding);
- Weakness or paralysis on part of or all of one side of the body;
- Speech abnormalities;
- Visual disturbances;
- Swallowing/choking potential; and
- Headache

The 8 D’s of Stroke Care

Detection – rapid recognition of symptoms
Dispatch – Call 911 early
Delivery – Rapid EMS identification and transport
Door – Get to an appropriate stroke center
Data – Rapid triage within ED
Decision – Stroke expertise and therapy
Drug – Fibrinolytic therapy
Disposition – Rapid admission to stroke unit or CCU
Types of Stroke:

- Ischemic – 87% of all strokes
- Hemorrhagic – 13% of all strokes

Cincinnati Prehospital Stroke Scale

- Time from arrival at hospital to the CT being run is 25 minutes with the CT being run and interpreted in 45 minutes of arrival at the hospital
- The CT must be completed and read to determine which type of stroke
  - Hemorrhage = Yes
    - Neurology consult and admission to a stroke or IC unit
  - Hemorrhage = No
    - Consider fibrinolytic therapy
### Fibrinolytic Check List

- "Standard" fibrinolytic therapy for stroke:
  - At least 18, onset of symptoms < 3 hours, ischemic stroke seen on CT

- "Select" fibrinolytic therapy for stroke:
  - Onset of symptoms between 3 and 4.5 hours, age < 80, no oral anticoagulant use regardless of INR, no history of diabetes and no history of prior ischemic stroke

- Endovascular treatments for stroke:
  - This therapy can be used up to 6 hours from the onset of symptoms but per the AHA has not been approved by the FDA

- Cerebral Intra-arterial rtPA:
  - This therapy can be used up to 6 hours from the onset of symptoms but per the AHA has not been approved by the FDA

### More Stroke Fundamentals

Because we know a CT must be done EMS systems transporting a suspected stroke patient "code stroke" should skip any hospitals that do not have a functioning CT. This is why family should not transport but call EMS whenever a stroke is suspected.

**Time is BRAIN**

Going to the wrong facility will cost BRAIN