

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;




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Underlying, life-threatening causes of chest discomfort include:

- Aortic dissection;
- Pulmonary embolism;
- Acute pericarditis with effusion and tamponade; and
- Tension pneumothorax




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Immediate Assessment and Treatment for ACS include:

- Oxygen therapy, maintaining O₂ 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



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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



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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

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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


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Suspected Stroke Overview




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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!!!!




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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




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REMEMBER TIME IS BRAIN

- **EMS** - rapid identification and assessment and rapid transport to a stroke facility
- The goal for EMS is to be off the scene, transporting to a stroke facility within 10 minutes of arrival
- **In-hospital** – rapid determination of fibrinolytic eligibility
- The goal for the hospital is door (arrival at the hospital) to starting fibrinolytic therapy is 60 minutes.




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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

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Stroke Assessment



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Cincinnati Prehospital Stroke Scale

Cincinnati Pre-hospital Stroke Scale

- 1. FACIAL DROOP:** Have patient show teeth or smile.
 - Normal: both sides of the face move equally
 - Abnormal: one side of face does not move as well as the other side
- 2. ARM DRIFT:** Patient closes eyes & holds both arms out for 10 sec.
 - Normal: both arms move the same or both arms do not move at all
 - Abnormal: one arm does not move or drifts down compared to the other
- 3. ABNORMAL SPEECH:** Have the patient say "you can't teach an old dog new tricks."
 - Normal: patient uses correct words with no slurring
 - Abnormal: patient slurs words, uses the wrong words, or is unable to speak

INTERPRETATION: If any 1 of these 3 signs is abnormal, the probability of a stroke is 72%.

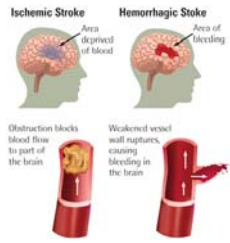
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Types of Stroke:

Ischemic – 87% of all strokes

Hemorrhagic – 13% of all strokes



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- 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
- Edovascular 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