



# Emergency Medicine Final

## 🎧 Podcast Style Review (Experimental Feature)

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- **NOTE:** Highlighted in **bold** are the important key info!
- Topics are arranged in order of most to least commonly tested
- Check the table of contents below for easier navigation
- Good luck 🍀

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## 1. ECG Interpretation & Associated Management

### Acute Coronary Syndromes (ACS) - STEMI/NSTEMI/Angina

- **STEMI Diagnosis:** Characterized by **ST elevation** on ECG. Requires prompt action.
  - **Definitive Management: Percutaneous Coronary Intervention (PCI)** is the gold standard.
  - **Time Goal:** Ideal time from ER presentation to PCI is **within 90 minutes**.

- **Pre-hospital/Transport:** Aim for PCI within 15 minutes if transferring from ambulance/another facility to a **PCI-capable hospital**. Prioritize PCI capability over proximity if transfer time is short (e.g., 15 mins).
- **Initial ER Management: Aspirin** should be given to all patients (unless contraindicated). Oxygen is not needed if O<sub>2</sub> saturation is >98%. **Do not wait for biomarkers** to start treatment for STEMI.
- **NSTEMI Diagnosis:** Presents with chest pain and **elevated troponin** but **no ST elevation** on ECG (may have non-specific changes, ST depression, or T-wave inversions).
- **Angina:**
  - **Stable Angina:** Chest pain typically related to exertion, may have history. ECG might be normal or show non-specific changes between episodes. Pain resolves with rest.
  - **Unstable Angina:** Chest pain occurring at rest or with increasing frequency/severity. ECG may show changes, but troponin is *not* elevated.
- **Initial Management (Suspected ACS):** Connect to cardiac monitor, administer aspirin and nitroglycerin (unless contraindicated).

## Arrhythmias (Recognition & Management)

- **Atrial Fibrillation (A-Fib):** Irregularly irregular rhythm, no discernible P waves.
  - **Stable Patient:** First-line treatment can be rate control (e.g., **Diltiazem**, especially noted for asthmatic patients). Beta-blockers are also an option.
- **Atrial Flutter:** Saw-tooth pattern of flutter waves.
  - **Stable Patient:** Management often involves rate control (e.g., **Beta blocker**).
- **Ventricular Tachycardia (V-Tach):** Wide complex tachycardia.
  - **Stable Patient (with pulse, no severe symptoms):** **Amiodarone** is a primary treatment.
  - **Unstable Patient (with pulse):** **Synchronized Cardioversion**. (Initial energy noted as 50 Joules in one instance, though specific energy varies).
- **Ventricular Fibrillation (V-Fib):** Chaotic, disorganized electrical activity, no pulse.
  - **Management: Immediate Defibrillation** (e.g., 200 J noted). Follow ALS algorithm (CPR, Epinephrine, potentially Amiodarone).
- **Torsades de Pointes:** Polymorphic V-Tach (associated with prolonged QT). Often occurs in context of collapse/syncope.
- **Supraventricular Tachycardia (SVT):** Narrow complex tachycardia (usually).
  - **Stable Patient:** Consider vagal maneuvers (e.g., **carotid massage**), **Adenosine**.
  - **Unstable Patient:** **Synchronized Cardioversion**.
- **Pulseless Electrical Activity (PEA):** Organized rhythm on ECG but no detectable pulse.
  - **Management: CPR and Epinephrine.** Address underlying causes (H's and T's).
- **Asystole:** Flat line, no electrical activity.
  - **Management: CPR and Epinephrine.**

## Conduction Blocks (Recognition & Management)

- **First Degree AV Block:** Prolonged PR interval (>0.2s), every P wave is followed by a QRS.
- **Second Degree AV Block Type 1 (Wenckebach/Mobitz I):** **Progressive prolongation of the PR interval** until a P wave is not conducted (dropped QRS).
- **Second Degree AV Block Type 2 (Mobitz II):** Intermittent non-conducted P waves (dropped QRS) **without progressive PR prolongation**. PR interval of conducted beats is constant. Can progress to complete heart block.
- **Third Degree (Complete) AV Block:** Complete dissociation between P waves and QRS complexes. Atria and ventricles beat independently. P-R intervals are variable. Often results in significant bradycardia.
  - **Management (if symptomatic/unstable):** **Transcutaneous Pacing** initially, may require a **permanent pacemaker**.
- **Left Bundle Branch Block (LBBB):** Can occur with arrhythmias like A-Fib.

## MI Localization (Based on ST Elevation)

- **Inferior MI:** Leads II, III, aVF. Often involves Right Coronary Artery.
- **Anterior MI:** Leads V3, V4. Involves Left Anterior Descending artery.
- **Septal MI:** Leads V1, V2.
- **Lateral MI:** Leads I, aVL, V5, V6. Involves Circumflex or LAD diagonal branches.
- **Anterolateral MI:** Leads I, aVL, V3-V6. Involves Left Anterior Descending or Left Main stem artery.
- **Posterior MI:** Look for reciprocal changes (ST depression) in V1-V3.

## 2. Basic & Advanced Life Support (BLS/ALS)

### CPR Fundamentals

- **Initial Steps:** Assess victim, shout for help, **Activate EMS and get AED**, check for pulse/breathing.
- **Pulse Check:** Check carotid pulse for **no more than 10 seconds**.
- **Chest Compressions:**
  - **Ratio (Adult/Single Rescuer Child/Infant): 30 compressions : 2 breaths.**
  - **Ratio (2-Rescuer Child/Infant): 15 compressions : 2 breaths.**
  - **Depth (Adult):** At least **2 inches**.
  - **Rate:** 100-120 compressions per minute.
  - **Quality:** Allow **full chest recoil, minimize interruptions**.
- **Rescue Breaths (Apneic patient with a pulse):** Give 1 breath every 6 seconds. Re-check pulse **every 2 minutes**.
- **AED Use:** Apply as soon as available, follow prompts.
- **Switching Rescuers:** Change compressors **every 5 cycles** (or approx. 2 minutes) to minimize fatigue.
- **Compression-Only CPR:** Indicated if bystanders are unwilling/unable to perform rescue breaths (e.g., presence of vomitus).
- **Airway Obstruction/Ventilation Issues:** If initial breaths don't go in, **repeat head tilt/chin lift** and attempt ventilation again before proceeding with compressions.
- **Unresponsive Child Protocol:** After activating help and confirming no breathing, start **chest compressions**. (Note: Text implies most pediatric arrests are respiratory, but immediate action listed is compressions).

### Management of Specific Arrest Rhythms

- **Ventricular Fibrillation (V-Fib) / Pulseless V-Tach:**
  - **Highest Priority: Early Defibrillation.**
  - Follow with CPR, **Epinephrine**, consider **Amiodarone**.
- **Pulseless Electrical Activity (PEA):**
  - **Management: CPR and Epinephrine.** Identify and treat reversible causes (H's and T's). **Not a shockable rhythm.**
- **Asystole:**
  - **Management: CPR and Epinephrine.** Confirm in two leads. **Not a shockable rhythm.**

### Post-Resuscitation Care

- **Rhythm Conversion to AV Block:** If a patient converts from V-Fib (after shock) to a third-degree AV block (and potentially remains unstable/pulseless or bradycardic with poor perfusion), **Transcutaneous Pacing** is indicated. (Note: Distinction between pulseless AV block vs. AV block with pulse wasn't fully specified, but pacing is the relevant intervention for symptomatic bradycardia/block post-arrest).

## 3. Bradycardia & Tachycardia Algorithms (Non-Arrest)

## Symptomatic Bradycardia

- **Definition:** Slow heart rate associated with signs of poor perfusion (hypotension, altered mental status, chest pain, shock).
- **First-line Treatment: Atropine.**
- **If Atropine Ineffective/Not Indicated: Transcutaneous Pacing.** Prepare for transvenous pacing. IV **Epinephrine** or Dopamine infusion can be considered while awaiting pacing.
- **Initial Assessment:** Check **Perfusion**, BP, HR, Rhythm.

## Tachycardia (Stable & Unstable)

- **Assessment:** Determine if stable or unstable (hypotension, altered mental status, shock, ischemic chest pain, acute heart failure).
- **Unstable Tachycardia (Any type with pulse):**
  - **Management: Immediate Synchronized Cardioversion.**
- **Stable Tachycardia (Specific Types):**
  - **Stable SVT:** Vagal maneuvers, **Adenosine.**
  - **Stable A-Fib/Flutter:** Rate control (e.g., **Beta-blockers, Diltiazem.**)
  - **Stable V-Tach (Monomorphic): Amiodarone.**

# 4. Stroke & Neurological Emergencies

## Stroke/TIA Identification & Localization

- **Vertebrobasilar Artery Territory (TIA/Stroke):** Symptoms include **vertigo, double vision, difficulty speaking (dysarthria)**, ataxia, nystagmus, contralateral motor deficit, intention tremor, dysdiadochokinesia. Often affects brainstem/cerebellum.
- **Middle Cerebral Artery Territory (TIA/Stroke):** Can cause contralateral weakness, sensory loss, speech issues (aphasia if dominant hemisphere).
- **Frontal Lobe Lesion:** Can cause contralateral weakness (e.g., arm weakness, **pronator drift**) with intact sensation. Location cited specifically as **right frontal lobe** for *left* arm weakness/drift.
- **Transient Ischemic Attack (TIA):** Stroke symptoms that **resolve completely**, often within minutes to an hour or two.
- **Differentiation:** Clinical presentation helps localize the affected vessel/area.

## Glasgow Coma Scale (GCS) Assessment

- Assesses level of consciousness based on Eye Opening (E), Verbal Response (V), and Motor Response (M).
- **Example Scenario Breakdown:**
  - Eyes closed, open to voice = **E3**
  - Says words that don't make sense (inappropriate words) = **V3**
  - Moves to locate and remove central stimulus = **M5**
  - **Total GCS = E3 V3 M5 = 11**

# 5. Thrombolysis

## Indications (STEMI, Stroke)

- Used for STEMI if PCI is not available within the recommended timeframe.
- Used for acute ischemic stroke within a specific time window (e.g., 3-4.5 hours).

## Contraindications

- **Absolute/Strong Contraindications:**
  - **Previous Stroke** (timeframe may matter, but listed generally).
  - **Active Bleeding.**
  - **Known Brain Tumour.**
  - **Significant head trauma or prior intracranial hemorrhage.**
- **Relative Contraindications/Exclusion Criteria:**
  - **Blood Pressure:** Significantly elevated BP (e.g., **>180/110 mmHg**, or **>200/110 mmHg**, or **210/110 mmHg** noted in different contexts as too high). Needs control before tPA.
  - **Platelet Count:** Low platelets (e.g., < 100k often cited, though **<150** was listed as *not* a contraindication in one question, implying the threshold might be lower or context-dependent. However, **platelets 250** was listed as *not* being a reason to *exclude* tPA). Requires careful interpretation based on specific guidelines not fully detailed here.
  - **INR:** Elevated INR (e.g., **>1.7**).
  - **Large MCA Territory Stroke:** Involvement of **>1/3 of the MCA territory** on imaging.
  - **Time Window:** Symptoms present for too long (e.g., stroke symptoms noticed **5 hours ago**, symptoms of ischemia for **30 min** is a potential candidate).
  - **Recent Surgery/Trauma.**
  - **No findings on CT** (for stroke, this doesn't exclude, but hemorrhage does).
- **Note:** Limb weakness for 2 hours duration *is* potentially within the window for stroke thrombolysis.

## 6. Trauma Management

### Primary Survey & Initial Assessment

- **ABCDE Approach:** Airway, Breathing, Circulation, Disability, Exposure/Environment.
- **Items Not in Primary Survey: Nasogastric tube, Taking full history.** Pelvic and Chest X-rays are adjuncts, not typically done *during* the initial ABC assessment itself but shortly after. Oxygen is often applied during initial assessment. Brain CT is usually part of secondary survey or reassessment unless immediate neurological concern dictates otherwise.
- **Initial Assessment Focus:** Identify and manage life-threatening conditions immediately.

### Airway Management

- **Definitive Airway:** Required for patients unable to maintain/protect their airway (e.g., GCS  $\leq$  8, severe facial trauma).
  - **Considered Definitive: Orotracheal tube, Nasotracheal tube, Surgical cricothyroidotomy tube, Tracheostomy tube.**
  - **NOT Considered Definitive: Laryngeal Mask Airway (LMA) device.**
- **Airway Obstruction Signs:** Neck vein distention is **not** an objective sign of airway obstruction itself (more related to circulation/breathing issues like tension pneumo or tamponade). Signs include noisy breathing, stridor, inability to speak, paradoxical chest movement.

### Shock Management

- **Hypovolemic Shock Classification:** Based on vital signs (HR, BP), mental status, fluid loss.
  - **Class III Shock Example:** HR 110, BP 70/50, anxious patient (falling from height). Requires aggressive fluid resuscitation.
- **Conditions Affecting Circulation:** Femoral fracture, spinal cord injury, brain trauma (can cause neurogenic shock), ruptured heart valve, cardiac tamponade. **2nd-degree burn of 20% BSA** primarily affects fluid balance/circulation later, not usually the *immediate* cause of circulatory collapse in the primary survey like major hemorrhage or tamponade.
- **Conditions Affecting Ventilation:** Airway obstruction, flail chest/pulmonary contusion, hemothorax, tension pneumothorax. **Cardiac tamponade** primarily affects circulation, though severe compromise can impact breathing

effort.

## 7. Miscellaneous Topics

### Headache

- **Sudden Severe Headache ("Thunderclap"):** Concerning for **Subarachnoid Hemorrhage (SAH)**, especially with neck stiffness, photosensitivity, vomiting.
  - **Management:** Immediate BP control (e.g., **Nicardipine** if hypertensive like 190/110), neuroimaging.
- **Headache Pattern Matching:**
  - **SAH:** Associated with **neck stiffness**.
  - **Tension:** Associated with **tenderness with touch**.
  - **Cluster:** Band-like description (though typically unilateral/orbital).
  - **Migraine:** Early morning presentation possible.
- **Ehlers-Danlos Syndrome:** Patient presented with headache, stiff neck, photosensitivity, nausea (suggestive of SAH or similar vascular event). Management focused on BP control (**Nicardipine**).

### Other Reported Topics

- **Organophosphate Poisoning (Farmer Scenario):** Cyanosis, frothy secretions, difficulty breathing, **pinpoint pupils**.
  - **First Action: Clear Airways.** (Followed by Atropine, Pralidoxime).
- **Snake Bite:**
  - **First Aid:** Remove constricting items, immobilize limb, rest victim. **Do NOT** apply tight constricting band or make incisions.
- **Forensic Reporting:** For assault cases (e.g., head injury after quarrel), documentation should include **specific details about the injury**. Mechanism might be described as "collided a blunt object".
- **Reportable Diseases:** Cholera, plague, poliomyelitis, yellow fever require immediate reporting. Meningitis might also be reportable but was suggested as the exception in one question.
- **Glucose Check:** Important next step in patient with unknown history presenting with **dysarthria only**.