Adult Cardiac Life Support (ACLS)

Recertification Preparatory Materials
### ADULT CARDIAC LIFE SUPPORT (ACLS) RECERTIFICATION

#### TABLE OF CONTENTS

**PRIMARY AND SECONDARY ABCDs**
- I. Primary ABCD’s  
  03
- II. Secondary ABCD’s  
  04

**AIRWAY SKILLS**
- I. Basic  
  04
- II. Advanced  
  05

**ARRHYTHMIAS**  
  06

**ELECTRICAL THERAPY**  
  07

**VASCULAR ACCESS**  
  07

**ACLS DRUGS**  
  08

**ACLS CORE CASES**
- I. Respiratory Arrest Case  
  09
- II. VF Treated with CPR and AED Case  
  09
- III. Pulseless Arrest: VF / Pulseless VT Case  
  10
- IV. Pulseless Arrest: Pulseless Electrical Activity (PEA) Case  
  11
- V. Pulseless Arrest: Aystole Case  
  11
- VI. Acute Coronary Symptoms (ACS)  
  13
- VII. Bradycardia Case  
  14
- VIII. Unstable Tachycardia  
  15
- IX. Stable Tachycardia  
  15
- X. Acute Stroke Case  
  17

www.CPRTrainingFast.com
What is ACLS?

ACLS is an “assess – then manage” approach for those at risk of or in cardiac arrest.

Primary and Secondary ABCD’s

This is a methodical “assess-then-manage” approach used to treat adults in respiratory distress and failure, stable and unstable arrhythmias and pulseless arrest. Algorithms are “menus” that guide you through recommended treatment interventions.

Know the following ABCD’s approach because it begins all ACLS case scenarios. The information you gather during the assessment will determine which algorithm you choose for the patient’s treatment.

I. Primary ABCDs: these refer to CPR and the AED.
   A. Assess: Tap and ask: “Are you OK?”
      A. send someone to call 911 and bring an AED
      B. if alone, call 911, get an AED and return to victim

      Airway: Open with the head-tilt/chin lift.
   B. Breathing: Assess for adequate breathing.
      1. if inadequate: give 2 breaths over 1 second each
      2. each breath should cause a visible chest rise
      3. use mouth-to-mask or barrier, bag – mask - ventilation (BMV) or mouth – to – mouth
      4. give oxygen (O2) as soon as it is available
   C. Circulation: Check carotid pulse for no more than 10 seconds
      1. if not definitely felt, give 30 compressions in center of chest between the nipples
      2. compress the chest wall 1½ - 2 inches
      3. one cycle of CPR is 30 compressions and 2 breaths
      4. give 5 cycles of CPR (about 2 minutes)
      5. minimize interruptions to compressions
      6. 2 rescuers: the compressor PAUSES while 2 breaths are given
      7. change compressors after 5 cycles to avoid fatigue and ineffective compressions
   D. Defibrillation: When an AED arrives, immediately power it on!
      1. follow the voice prompts
      2. use adult pads on adults

www.CPRTrainingFast.com
II. Secondary ABCDs

A. Airway: Use bag – mask connected to 100% O₂
   1. give each breath over 1 second each
   2. compressor pauses to allow the 2 breaths to go in
   3. consider inserting an advanced airway, (see Advanced Airway on page 5)

B. Breathing: Look for visible chest rise during each breath
   1. confirm advanced airway tube placement (see Advanced Airway on page 5)
   2. secure the airway tube.
   3. compressor now gives 100 continuous compressions per minute
   4. ventilator gives 8-10 breaths per minute (one every 6-9 seconds)

C. Circulation: Obtain vascular access with an IV(intravascular) or 10 (intraosseous) cannula
   1) give drugs as recommended per algorithm.

D. Diagnosis: Why is the patient in the rhythm? Look for any possible causes to treat:

<table>
<thead>
<tr>
<th>6 Hs</th>
<th>5 Ts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
<td>T amponade</td>
</tr>
<tr>
<td>Hypovolemia</td>
<td>T tension pneumothorax</td>
</tr>
<tr>
<td>Hypothermia</td>
<td>T oxins – poisons, drugs</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>T hrombosis – coronary (AMI) – pulmonary (PE)</td>
</tr>
<tr>
<td>Hypo / Hyperkalemia</td>
<td>T trauma</td>
</tr>
<tr>
<td>Hydrogen ion (acidosis)</td>
<td></td>
</tr>
</tbody>
</table>

Airway Skills

I. Basic Airway

A. Oxygen

B. Open the Airway
   1. use the head - tilt chin lift when assessing for adequate breathing
   2. use a jaw thrust for unresponsive – unwitnessed, trauma or drowning victims
       • if unable to open the airway with a jaw thrust, use head-tilt chin lift

C. Maintain
   1. insert an oropharyngeal airway when unconscious with no cough or gag reflex
   2. insert a nasopharyngeal airway when a cough or gag reflex is present (better tolerated)

D. Ventilate: give each breath over 1 second using enough volume to see the chest rise
   1. 2-rescuer CPR: give 2 breaths during the pause following 30 compressions
   2. Rescue breathing: when a pulse is present, give 10-12 breaths/minute (one each 5-6 seconds)
II. Advanced Airway

A. Laryngeal Mask Airway (LMA): requires the least training for insertion
   1. inserts blindly into the hypopharynx
   2. regurgitation and aspiration are reduced but not prevented
   3. confirm placement: see chest rise and listen for breath sounds over lung fields
   4. contraindications: gastric reflux, full stomach, pregnancy or morbid obesity

B. Combitube: requires more training for insertion than the LMA
   1. inserts blindly into esophagus (80% of the time) or the trachea
   2. ventilation can occur whether the tube is the esophagus or the trachea
   3. confirm placement: clinical exam and a confirmation device (see devices)
   4. contraindications: gag reflex, esophageal disease, caustic ingestion, under 16 years of age or under 60 inches in height

C. Endotracheal Tube (ETT): requires the most training, skill and frequent retraining for insertion
   1. inserts by direct visualization of vocal chords
   2. isolates the trachea, greatly reduces risk of aspiration and provides reliable ventilation
   3. high risk of tube displacement or obstruction whenever patient is moved
   4. confirm placement, clinical exam and a confirmation device (see devices)

D. Confirm tube placement
   1. Clinical Assessment
      a. look for bilateral chest rise
      b. listen for breath sounds over stomach and the 4 lung fields (left and right anterior and midaxillary)
      c. look for water vapor in the tube (if seen this is helpful but not definitive)
   2. Devices
      a. End-Tidal CO₂ Detector (ETD): if weight > 2 kg
          i. attaches between the ET and Ambu bag; give 6 breaths with the Ambu bag
          ii. litmus paper center should change color with each inhalation and each exhalation
              ▪ original color on inhalation = OK O₂ is being exhaled: expected
              ▪ color change on exhalation = CO₂!! Tube is in trachea
          iii. Trouble shooting: original color on exhalation =
              ▪ litmus paper is wet replace ETD, or
              ▪ tube is not in trachea remove ET, or
              ▪ cardiac output is low during CPR
      b. Esophageal Detector (EDD): if weight > 20 kg and in a perfusing rhythm
         i. Resembles a turkey baster
            ▪ compress the bulb and attach to end of ET
            ▪ bulb inflates quickly - tube is in the trachea
            ▪ bulb inflates poorly - tube is in the esophagus
         ii. No recommendation for its use in cardiac arrest

www.CPRTrainingFast.com
Arrhythmias

**Pulseless Rhythms (Arrest Rhythms)**

- **Shockable**
  - VF (Ventricular Fibrillation)
  - VT (Ventricular Tach Pulsless)
  - Torsades de Pointes

- **Non-Shockable**
  - PEA (Pulseless Electrical Activity)
  - Asystole (Silent Heart)

**Perfusing Rhythms (Non-Arrest Rhythms)**

- **Bradycardia**
  - Sinus Bradycardia
  - Junctional Rhythm
  - Idioventricular Rhythm

- Artioventricular Block:
  - 1st Degree
  - 2nd Degree:
    - Mobitz Type I (Wenckebach)
    - Mobitz Type II
  - 3rd Degree (Complete Heart Block)

**Tachycardias: Narrow QRS**

- Regular Rhythms:
  - Sinus Tachycardias
  - Atrial Flutter
  - Supraventricular Tachycardia
  - Junctional Tachycardia

- Irregular Rhythms:
  - Atrial Flutter
  - Atrial Fibrillation
  - Multifocal Atrial Tachycardia

**Tachycardias: Wide QRS**

- Regular Rhythm:
  - Ventricular Tachycardia – monomorphic
  - Ventricular Tachycardia – polymorphic
  - Torsades des pointes
Electrical Therapy

I. Defibrillation: high energy shocks with manual defibrillator: ECC handbook, p. 9
   A. recommended shock dose: **biphasic = 120 – 200 J** (per manufacturer)
   B. recommended shock dose: **monophasic = 360 J**

II. Synchronized Cardioversion: timed low energy shocks: ECC handbook p. 14
   A. timed to QRS to reduce risk of “R-on-T”: a shock that hits the T wave may cause VF

III. Transcutaneous Pacer: noninvasive emergent bedside pacing: ECC handbook, p. 62
   A. apply pacer pads
   B. verify pacer capture

Vascular Access

- **Peripheral:** preferred in arrest due to easy access and no interruption in CPR
  A. use a large bore IV catheter
  B. attempt large veins: anticubital, external jugular, cephalic, femoral
  C. can take 1-2 minutes for IV drugs to reach the central circulation
  D. follow IV drugs with a 20 ml bolus of IV fluid and elevate extremity for 10-20 seconds

- **Intraosseous (IO):** inserts into a large bone and accesses the venous plexus
  A. may use if unable to obtain intravascular access
  B. drug delivery is similar to that via a central line
  C. safe access for fluids, drugs, blood samples
  D. commercial kits are available for IO access
  E. drug doses are the same as when given IV

- **Central Line:** not needed in most resuscitations
  A. insertion requires interruption of CPR
  B. if a central line is already in place and patent, it can be used

- **Endotracheal:** some drugs may be given via the ETT in the absence of a IV/IO
  A. drug delivery is unpredictable thus IV/IO delivery is preferred
  B. drug blood concentration stay lower than when given IV
  C. increase dose given to 2 – 2.5 times the recommended IV dose
  D. drugs that absorb via the trachea
  E. **N** aloxone
     A. **tropine**
    V. asopressin
    E. pinephrine
    L. idocaine
ACLS Drugs

- The primary focus in cardiac arrest is effective CPR and early defibrillation.
- Drug administration is secondary and should NOT interrupt CPR.
- Know the timing of drug administration in CPR as shown.
- The Class of Recommendation number denotes potential benefit versus risk.

General Statements:

- **Pulse arrest, all:** give a vasopressor drug – Epinephrine or Vasopressin
  Vasopressors cause peripheral vasoconstriction, which shunts increased blood flow to the heart and brain.

- **Pulseless ventricular rhythms: consider antiarrhythmics – Amiodarone, Lidocaine or Magnesium**
  May make myocardium easier to defibrillate and/or more difficult for it to again fibrillate after conversion.

- **Bradycardia:** give a “speed up” drug – Atropine
  Atropine blocks vagal input and stimulates the SA mode, which can increase heart rate.
  - Consider dopamine and epinephrine infusions if unresponsive to atropine and waiting on a pacer. Dopamine and epinephrine may increase heart rate but also increase myocardial oxygen demand.

- **Tachycardia, Reentry SVT:** give a drug to interrupt the rhythm – Adenosine
  Adenosine blocks the AV node for a few seconds, which may break the re-entry pattern.

- **Tachycardia, A fib or A flutter:** to convert rhythm – Amiodarone
  to slow rate – beta blocker – Diltiazem

- **Tachycardia, VT, stable:** to convert rhythm – Amiodarone or Sync Cardiovert

- **Acute Coronary Syndromes:** first line treatment is “MONA” ECC
  - M orphine decreases pain not relieved by nitroglycerin; also dilates peripheral vessels decreasing resistance against which the heart has to pump
  - O xygen increases the oxygen available to the ischemic or injured heart muscle
  - N itroglycerin dilates coronary arteries so more oxygenated blood can reach the muscle and decrease pain; also dilates peripheral vessels decreasing resistance against which the heart has to pump
  - A spirin decreases platelet clumping, the first step in forming a new clot***
  ***If allergic to Aspirin (ASA): give Clopidogrel (Plavix) – affects platelet clumping similar to ASA
ACLS Core Cases

I. Respiratory Arrest Case

II. VF Treated with CPR and AED Case
You are walking down the hall and the person in front of you suddenly collapses

• Assess:
  Tap, ask: Are you OK?
  No movement or response, call 911 and get the AED!!!
  or if a second person is present, send them to call and get the AED

• Primary ABCD Survey

  A irway: open and hold (head tilt – chin lift or Jaw Thrust)
  Look, listen & feel

  B reathing: give 2 breaths (1 second each) that make the chest rise
  *avoid rapid or forceful breaths

  C irculation: check carotid pulse – at least 5 but no longer than 10 seconds
  - begin CPR if a definite pulse is not felt
  - 30 compressions: 2 ventilations = 1 cycle
  - push hard: 1 ½ - 2 inches deep
  - push fast: 100 compressions per minute
  - allow the chest wall to completely recoil (take weight off hands)
  - minimize interruptions

  recheck pulse after 5 cycles of CPR (approximately 2 minutes)

  2 – rescuer CPR, basic airway: pause compressions to ventilate

D efibrillation: Automated External Defibrillator

1. Power On – turn power on (some AEDs automatically turn on)
2. Attachement – select adult pads
   a. attach pads to patient (upper right sterna border and cardiac apex)
   b. attach cables to AED, if needed
3. Analysis
   a. announce “analyzing rhythm – stand clear!”
   b. press analyze, if needed
4. Shock
   a. if shock indicated:
      • announce “Shock is indicated. Stand Clear! I’m going to shock.”
      • verify no one is touching the patient
      • press shock button when signaled to do so
   b. if no shock indicated, follow prompts from AED

www.CPRTrainingFast.com
Unacceptable actions:
- did not provide effective CPR
- did not follow AED’s commands
- did not clear patient before shock (unsafe defibrillation)

III. Pulseless Arrest: VF / Pulseless VT Case
You respond to a patient monitor alarm, to find the patient is unresponsive. Call for help and begin CPR (primary ABCD survey). A team member arrives with the crash cart which has a manual defibrillator and advanced equipment. The patient is attached to the monitor and you identify and verify VT or PVT.

• Primary D: Defibrillation: Shock #1
  1. After verifying the rhythm, resume CPR while the defibrillator is charging
  2. once charged, Clear!!! ensure that no one is touching the patient or bed
  3. give 1 shock: biphasic defibrillators = manufacturer’s recommendation, if unknown 200J monophasic defibrillators = 360J
  4. Immediately resume CPR for 5 cycles
  5. After 5 cycles: check rhythm (shockable?), check pulse (5-10 seconds)

• Secondary ABCD Survey: conducted between 1st and 2nd shock and Ongoing
  1. Airway
     a. BVM with 100% O2
     b. consider advanced airway placement: LMA, Combitube or ETT
  2. Breathing
     a. check for visible chest rise with BVM
     b. confirm advanced airway placement by exam and confirmation device
     c. secure advanced airway in place with tape or a commercial device
     d. give 8-10 breaths/min and continuous compressions at 100 per minute
  3. Circulation: establish vascular access via IV or IO
     a. do not interrupt CPR for access
  4. Differential Diagnosis – use the H’s and T’s mnemonic

• Defibrillation: Shock #2
  1. after 5 cycles of CPR
     a. check rhythm (shockable?)
     b. check pulse (5 - 10 seconds)
  2. resume CPR while defibrillator is charging
  3. once charged, Clear!!! ensure no one is touching the patient or bed
  4. give 1 shock: biphasic defibrillators = manufacturer’s recommendation, if unknown 200J monophasic defibrillators = 360J
  5. immediately resume CPR for 5 cycles

www.CPRTrainingFast.com
• Medications: Administration either: give during CPR
  1. epinephrine 1 mg IV/IO (every 3 – 5 minutes) or
  2. vasopressin 40U IV/IO to replace the first or second dose of epinephrine

• Defibrillation: Shock #3
  1. after 5 cycles of CPR
  a. check rhythm (shockable?)
  b. check pulse (5 - 10 seconds)
  2. resume CPR while defibrillator is charging
  3. once charged, Clear!!! ensure no one is touching the patient or bed
  4. give 1 shock: biphasic defibrillators = manufacturer’s recommendation,
     if unknown 200J monophasic defibrillators = 360J
  5. immediately resume CPR for 5 cycles

• Medications: Consider Antiarrhythmics: give during CPR
  1. Amiodarone 300 mg IV/VO once, then consider additional 150 mg IV/VO once
  2. Lidocaine 1 – 1.5 mg/kg first dose then 0.5 – 0.75 mg/kg IV/VO, max 3 doses or 3 mg/kg
  3. Magnesium 1 – 2 g IV/VO loading doses for torsades de pointes

Unacceptable actions:
  • did not provide effective CPR
  • did not clear before shock
  • did not confirm advanced airway placement
  • did not give a vassopressor

IV. Pulseless Arrest: Pulseless Electrical Activity (PEA) Case

V. Pulseless Arrest: Asystole Case
You find that a patient is unresponsive. Call for help and begin CPR (primary ABCD survey). A team member arrives with a crash cart, which has a manual defibrillator and advanced equipment. The patient is attached to the monitor and you identify and verify Asystole or PEA.
  • Primary D: Defibrillation: NO shock indicated for Asystole or PEA
  • Secondary ABCD Survey: Ongoing
    1. BVM with 100% O2
    2. consider advanced airway placement: LMA, Combitude or ETT
  • Breathing
    1. check for visible chest rise with BVM
    2. confirm advanced airway placement by exam and confirmation device
    3. secure advanced airway in place with tape or a commercial device
    4. give 8-10 breaths/min and continuous compressions at 100 per minute
  • Circulation: establish vascular access via IV or IO
    1. do not interrupt CPR for access

www.CPRTrainingFast.com
• **Medication: give a vasopressor**
  1. **Epinephrine 1 mg IV/VO** (repeat every 3 – 5 minutes)
  2. **Vasopressin 40 U IV/VO** to replace first or second dose of epinephrine
  3. **consider Atropine 1 mg for Asystole or PEA rate less than 60**
  4. **check rhythm, check pulse after 2 minutes of CPR (5 cycles)**

• **Differential Diagnosis – use the H’s and T’s mnemonic**

<table>
<thead>
<tr>
<th>6 Hs</th>
<th>5 Ts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
<td>Tamponade</td>
</tr>
<tr>
<td>Hypovolemia</td>
<td>Tension pneumothorax</td>
</tr>
<tr>
<td>Hypothermia</td>
<td>Toxins – poisons, drugs</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>Thrombosis – coronary (AMI) –</td>
</tr>
<tr>
<td>H ypo / Hyperkalemia</td>
<td>pulmonary (PE)</td>
</tr>
<tr>
<td>Hydrogen ion (acidosis)</td>
<td>Trauma</td>
</tr>
</tbody>
</table>

• **Consider family members**

**Unacceptable actions:**
- did not provide effective CPR
- did not confirm advanced airway placement
- did not give a vasopressor
- did not look for reversible causes to treat
- attempted defibrillation
- attempted transcutaneous pacing for asystole
VI. Acute Coronary Symptoms (ACS) Case

Your neighbor complains of feeling weak and is sweaty, short of breath and slightly nauseated. You are worried this is an acute coronary problem can call 911. While waiting for their arrival, you ask if he can take aspirin. He says yes and you have him chew 2-3 baby aspirin (81 mg).

- EMS Arrival
  1. Attach monitor, start IV
  2. Give MONA
  3. Obtain 12-lead ECG, if available
  4. Notify hospital and transport
  5. Begin fibrinolytic checklist

- Arrival at ED: Assess

12-lead ECG

<table>
<thead>
<tr>
<th>ST segment Elevation (STEMI)</th>
<th>ST Segment Depression (Non-STEMI or NSTEMI)</th>
<th>ST-segment – T wave Normal</th>
</tr>
</thead>
</table>

- Injury Diagnostic
- Ischemia
- Non-Diagnostic

**Drug Therapy:**
- Beta Blockers: ↓ myocardial work
- Clopidogrel: ↓ platelet clumping
- Heparin: ↓ fibrin so new clot doesn’t form

**Goal is reperfusion by:**

**Fibrinolytic:** lyses fibrin in
- If <12 hours from onset
- If no contraindications
- ED door to drug goal = 30

Or PCI (percutaneous intervention: angioplasty and/or stents)
- If <12 hours from onset
- ED door to balloon goal = 90 min

**After reperfusion give:**
- Resume above drugs
- ACE-inhibitor: ↓ myocardial work
- Statin: ↓ inflammation and arrhythmias

**Drug Therapy:**
- Nitroglycerin: ↓ work
- Beta blockers
- Clopidogrel
- Heparin
- Ilb / Illa inhibitor: ↓ platelet-fibrin bonding

**Goal is revascularization:**
- PCI or possible surgery

**After revascularization give:**
- Resume above drugs as needed
- ACE-inhibitor
- Statin

**Consider admit to ED bed:**
- Serial enzymes + Troponin:
  - Repeat ECGs
  - Monitor ST segment
  - Consider stress test

**Admit to hospital bed if:**
- Troponin positive
- ST segment deviates
- Refractory chest pain
- Ventricular Tachycardia
- Becomes unstable

**Discharge if:**
- No ischemia / injury evolves
- Give follow-up directions

[www.CPRTrainingFast.com](http://www.CPRTrainingFast.com)
Unacceptable actions:
- did not give oxygen and aspirin to a suspected chest pain patient
- did not attempt to control chest pain
- did not obtain 12 - lead ECG

VII. Bradycardia Case
A patient appears pale and complains of dizziness and fatigue. The pulse rate is 56, blood pressure is 86/60 and on the monitor you identify a bradycardia rhythm.

- Primary ABCD Survey:
  1. Maintain patient airway; assist breathing as needed
  2. Give oxygen
  3. Monitor ECG (identify rhythm), blood pressure, oximetry
  4. Establish IV access

- Assess rhythm and perfusion:

<table>
<thead>
<tr>
<th>Observe/Monitor</th>
<th>Adequate Perfusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the heart rate &lt;60 bpm or Inadequate for clinical condition</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Signs or symptoms of poor perfusion caused by the Bradycardia?</td>
<td></td>
</tr>
<tr>
<td>(eg, acute altered mental status, ongoing chest pain, hypotension, or other signs of shock)</td>
<td></td>
</tr>
</tbody>
</table>

- Prepare for transcutanous pacing:
  - use without delay for high-degree block (type II second-degree block or third-degree AV block)
  - Consider Atropine 0.5 mg IV while awaiting pacer. May repeat to a total dose of 3 mg. If ineffective, begin pacing.
  - Consider epinephrine (2 to 10 ug/min) or dopamine (2 to 10 ug/kg per min) infusion while awaiting pacer or if pacing ineffective

www.CPRTrainingFast.com
Poor Perfusion

Reminders

- If pulseless arrest develops, go to Pulseless Arrest Algorithm
- Search for and treat possible contributing factors:
  - Hypovolemia
  - Hypoxia
  - Hydrogen Ion (acidosis)
  - Hypo/hyperkalemia
  - Hypoglycemia
  - Hypothermia
  - Toxins
  - Tamponade, cardiac
  - Tension pneumothorax
  - Thrombosis (coronary or pulmonary)
  - Trauma (hypovolemia, increased ICP)

• Prepare for transvenous pacing
• Treat contributing causes
• Consider expert consultation

Unacceptable actions:
  • did not identify a high-degree block
  • did not initiate TCP immediately for high-degree block
  • treated asymptomatic patient as if had poor perfusion

VIII. Unstable Tachycardia Case

IX. Stable Tachycardia Case
A patient appears pale and complains of dizziness and fatigue. The pulse rate is 170, blood pressure is 100/60 and on the monitor you identify a tachycardia rhythm.

• Primary ABCD Survey
  1. assess and support ABC’s as needed
  2. give Oxygen
  3. monitor ECG (identify rhythm), blood pressure, oximetry
  4. identify and treat reversible causes

• Is patient stable?
  1. unstable signs include altered mental status, ongoing chest pain, hypotension, or other signs of shock
  2. Note: rate-related symptoms uncommon if heart rate <150/min
  3. Unstable – perform Immediate Synchronized Cardioversion
     a. establish IV access and give sedation if patient is conscious: do not delay Cardioversion.
     b. consider expert consultation
     c. if pulseless arrest develops, see Pulseless Arrest Algorithm

www.CPRTrainingFast.com
4. **Stable** – See chart below.
   a. establish IV access
   b. obtain 12-lead ECG (when available or rhythm strip)
   c. **Is QRS narrow (<0.12 sec)?**

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>Regular</td>
</tr>
<tr>
<td>▪ Attempt vagal maneuvers</td>
<td></td>
</tr>
<tr>
<td>▪ Give <strong>Adenosine</strong> 6 mg rapid IV push. If no conversion, give 12 mg rapid IV push; may repeat 12 mg dose once</td>
<td></td>
</tr>
<tr>
<td>Irregular</td>
<td>Irregular</td>
</tr>
<tr>
<td>Does rhythm convert?</td>
<td></td>
</tr>
<tr>
<td>Note: Consider expert consultation</td>
<td>If ventricular tachycardia or uncertain rhythm</td>
</tr>
<tr>
<td>Converts</td>
<td></td>
</tr>
<tr>
<td>If rhythm converts, probable reentry SVT:</td>
<td>If atrial fibrillation with aberrancy</td>
</tr>
<tr>
<td>- observe for recurrence</td>
<td>▪ See Irregular Narrow Complex tachycardia</td>
</tr>
<tr>
<td>- treat recurrence with adenosine or longer-acting AV nodal blocking agent</td>
<td>▪ expert consultation advised</td>
</tr>
<tr>
<td>Does Not Convert</td>
<td></td>
</tr>
<tr>
<td>If rhythm does not convert, possible atrial flutter, ectopic atrial tachycardia, or Junctional tachycardia:</td>
<td>▪ avoid AV nodal blocking agents (eg, adenosine, digoxin, diltiazem, verapamil)</td>
</tr>
<tr>
<td>- control rate</td>
<td>▪ consider antiarrhythmics (eg, amiodarone 150 mg IV over 10 min</td>
</tr>
<tr>
<td>- treat underlying cause</td>
<td>If recurrent polymorphic VT, seek expert consultation.</td>
</tr>
<tr>
<td>- consider expert consultation</td>
<td>If <strong>torsades de pointes</strong>, give <strong>magnesium</strong> (load with 1-2 g over 5-60 min, then infusion.</td>
</tr>
</tbody>
</table>

www.CPRTrainingFast.com
X. Acute Stroke Case

You find a normally alert, active adult in a chair staring blankly at the television and leaning to one side.

- **Identify signs of possible stroke**
  
  1. **Critical EMS assessments and actions**
     
     a. Support ABC’s; give **oxygen** if needed
     
     b. Perform prehospital stroke assessment:
        
        - The Cincinnati Prehospital Stroke Scale
          
          ▪ Facial Droop (have the patient show teeth or smile)
          
          ▪ Arm Drift (patient closes eyes and extends both arms straight out with palms up, for 10 seconds)
          
          ▪ Abnormal Speech (have the patient say) “you can’t teach an old dog new tricks”
  
  2. establish time when patient last known normal (symptoms onset)
  
  3. transport; consider triage to a center with a stroke unit if appropriate; consider bringing a witness, family member or caregiver
  
  4. alert hospital
  
  5. check glucose if possible

- **ED Arrival: Immediate general assessment and stabilization ≤10 min**
  
  1. assess ABC’s, vital signs
  
  2. provide **oxygen** if hypoxemic
  
  3. obtain IV access and blood samples
  
  4. check glucose; treat if indicated
  
  5. perform neurologic screening assessment
  
  6. activate stroke team
  
  7. order emergent Non-contrast CT scan of brain
  
  8. obtain 12-lead ECG

- **ED Arrival: Immediate neurologic assessment by stroke team ≤ 25 min**
  
  1. review patient history
  
  2. establish symptom onset
  
  3. perform neurologic examination (NIH Stroke Scale)

- **Does CT scan show any hemorrhage? ≤45 min**
  
  1. **Hemorrhage** – consult neurologist or neurosurgeon; consider transfer
  
  2. **No hemorrhage**
     
     - **Probable acute ischemic stroke; consider fibrinolytic therapy**
     
     a. check for fibrinolytic exclusions
     
     b. repeat neurologic exam: are deficits rapidly improving?
3. Patient remains candidate for fibrinolytic therapy?
   a. Not a candidate
      - administer aspirin
   b. Candidate ≤60 min
      - Review risks / benefits with patient and family:
      - If acceptable —
        ▪ Give tPA
        ▪ No anticoagulants or antiplatelet treatment for 24 hours

www.CPRTrainingFast.com