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PALS STUDY GUIDE

Course Overview

This study guide is an outline of content that will be taught in the American Heart Association Accredited Pediatric Advance Life Support (PALS) Course. It is intended to summarize important content, but since all PALS content cannot possibly be absorbed in a class given every two years, it is expected that the student will have the 2010 Updated ECC Handbook readily available for review as a reference. The student is also required to have the AHA PALS Textbook available for reference and study for more in depth content.

- Agenda
 - Welcome, Introduction, Overview
 - Video Review
 - BLS Review
 - Simulation Base Scenarios
 - PALS Algorithms
 - Rapid Cardiopulmonary Assessment
 - Skills Stations
 - Skills Evaluation
 - Written Evaluation

Evidence Based Updates

Approximately every 5 years the AHA updates the guidelines for CPR and Emergency Cardiovascular Care. These updates are necessary to ensure that all AHA courses contain the best information and recommendations that can be supported by current scientific evidence experts from outside the United States and outside the AHA. The guidelines were then classified as to the strength of evidence that supports the recommendation.

Objectives

Upon the completion of this PALS course the participant will be able to:

- Identify lethal rhythms
- Describe Rapid Cardiopulmonary Assessment and use it as a guide while working through scenarios
- Verbalize treatment algorithms for each of the following lethal rhythms:
 - Pulseless arrest
 - Bradycardia
 - Tachycardia
- Verbalize steps to assess and treat shock
- Perform skills in 4 required skill stations
 - Bag-Mas Ventilation and Advance Airway
 - Arrhythmia recognition and Management, Cardioversion and Defibrillation
 - Vascular Access
 - BLS

BLS Review (Primary Survey Approach to ECC)

C - A - B

C = circulation

A = Airway

B = Breathing

D = Defibrillation

Rescue Techniques – CAB and D

Unresponsiveness: After determining that the scene is safe, check to see if victim is responsive and breathing normally. If the infant or child victim is unresponsive and NOT breathing normally, send someone to activate the emergency response system (EMS) – phone 911 and get the AED.

IF IN THE HOSPITAL, CALL THE CODE!!

If alone the rescuer calls out for “HELP” immediately for infants and children and begins C-A-B CPR and then phone 911 after two minutes of rescue support. The goal of “phone fast” approach is to deliver oxygen quickly because the most common cause of cardiac arrest in infants and children is a severe airway breathing problems, respiratory arrest, or shock.

Exception: for sudden, witnessed collapse of child or infant, active EMS immediately after verifying that victim is unresponsive.

Circulation: Check for pulse for 5 – 10 seconds.

Push Hard. Push Fast. Allow for full chest recoil. Minimize interruptions. Avoid Hyperventilation

- The best location for performing a pulse check for a child is the carotid artery of the neck. On an infant up to the age of one year, check the brachial pulse
- You should start cycles of chest compression and breathing when the victim is unresponsive, is not breathing adequately, and does not have a pulse
- The compression to ventilation ratio is 30:2
- Proper compression technique requires the right rate and depth of compression, as well as full chest recoil. Take your weight off your hands and allow the chest to come back to its normal position. Full chest recoil maximizes the return of blood to the heart after each compression.
- The rate of performing chest compression for a victim of any age (adult, child and infant) is at a rate of at least 100 compressions per minute.
- Compressions on the child, two hands are placed in the center of the chest between the nipples on the lower half of the sternum.
- Compressions on an infant are performed by using the two finger technique (pressing two fingers along the sternum, just below the nipple line, and the fingers of the hand wrap around the back and press in with each compression)
- Compression depth is about 2 inches on a child and about 1 ½ inches on an infant.
- Rotation of 2 – man CPR is every 2 minutes (5 cycles of 30:2) or after 5 cycles of 15:2 for two person CPR on infant and children.
- Minimize interruptions in chest compression will increase the victim’s chance of survival.

Airway: Open the Airway

- The head tilt-chin lift is the best way to open unresponsive victim’s airway when you do NOT suspect cervical spine injury.
- The jaw-thrust with cervical spine immobilization is used for opening airway without tilting the head or moving the neck if a neck injury is suspected (this includes drowning victims) – after two unsuccessful attempts, use head tilt-chin lift.

Breathing: Given two breaths

- To give breaths, pinch the victim’s nose closed, or for an infant place your mouth over the infant’s nose and mouth, and given 1 breath (blow for 1 second), watch for the chest to rise. If the chest does not rise, make a second attempt to open the airway with a head tilt-chin lift. Then give 1 breath (blow over 1 second) and watch for the chest to rise. Of course, if using mask barrier device or bag mask ventilation, there is no need to pinch the nose. Only provide enough air to see the chest rise and fall. If using a bag mask, there is no need to compress the bag completely.
- DO NOT over-inflate the lungs. The positive pressure in the chest that is created by rescue breaths will decrease venous return to the heart. This limits the refilling of the heart, so it will reduce cardiac output created by subsequent chest compressions.
- Some victims may continue to demonstrate agonal or gasping breaths for several minutes after a cardiac arrest, but these breaths are too slow or too shallow and will not maintain oxygenation. If there is a pulse, perform rescue breathing.

Defibrillation: Attach the Automated External Defibrillator (AED)

- The probability of successful defibrillation diminishes rapidly over time. Immediate CPR and defibrillation within no more than 3 to 5 minutes given a person in sudden cardiac arrest the best chance of survival.
- The AED is used on adults, children and infants.
- *If pediatric pads are unavailable, it is acceptable to use adult pads on an infant in cardiac arrest*
- Adult or Child victim: place one pad on the victim's upper right chest just below the collar bone and to the right of the sternum and the other pad on the left side and below the nipple, being careful that the pads do not touch. If the infant or child is small and the pads would touch, place the pads in an anterior/posterior position.
- Steps for defibrillation are: Power on the AED & Attach pads, clear the victim and allow the AED to analyze the rhythm – make sure not to touch the victim during the analyze phase, clear the victim and deliver shock, if advised.
- Make sure to clear the victim before shocking so that you and others helping do not get shocked.
- If not shock is advised, leave the AED pads on the victim and continue CPR, beginning with compressions.
- CPR alone may not save the life of sudden cardiac arrest victim. Early defibrillation is needed.

Primary Assessment: ABCDE

A – Airway

- Look for movement of the chest or abdomen
- Listen for air movement and breath sounds

Status	Description
Clear	Airway is open and unobstructed for normal breathing
Maintainable	Airway is obstructed but can be maintained by simple measures (eg, head tilt-chin lift)
Not Maintainable	Airway is obstructed and cannot be maintained without advanced interventions (eg, intubation)

B – Breathing

- Respiratory Rate
- Respiratory Effort
- Chest expansion and air movement
- Lung and airway sounds
- Oxygen saturation by pulse oximetry
- *A consistent respiratory rate of less than 10 or more than 60 breaths/min in a child of any age is abnormal and suggests the presence of a potentially serious problem.*

Age	Breaths/min
Infant (<1 year)	30 to 60
Toddler (1 - 3 years)	24 to 40
Preschooler (4 - 5 years)	22 to 34
School Age (6 to 12 years)	18 to 30
Adolescent (13 - 18 years)	12 to 16

Head Bobbing – often indicate that the child has increased risk for deterioration

- Caused by the use of neck muscles to assist breathing
- Most frequently seen in infants and can be a sign of respiratory failure

Pulse Oximetry Readings

- A child may be in respiratory distress yet maintain normal oxygen saturation by increasing respiratory rate and effort, especially if supplementary oxygen is administered.

C – Circulation

- Heart rate and rhythm
- Pulses (both peripheral and central)
- Capillary refill time
- Skin color and temperature
- Blood Pressure

Normal Heart Rate (per Minute) by Age

Age	Awake Rate	Mean	Sleeping Rate
Newborn to 3 months	85 to 205	140	80 to 160
3 months to 2 years	100 to 190	130	75 to 160
2 years to 10 years	60 to 140	80	60 to 90
> 10 years	60 to 100	75	50 to 90

Normal Blood Pressure in Children by Age

Age	Systolic Blood Pressure (mm Hg)		Diastolic Blood Pressure (mm Hg)	
	Female	Male	Female	Male
Neonate (1 day)	60 to 76	60 to 74	31 to 45	30 to 44
Neonate (4 day)	67 to 83	68 to 84	37 to 53	35 to 53
Infant (1 month)	73 to 91	74 to 94	36 to 56	37 to 55
Infant (3 month)	78 to 100	81 to 103	44 to 64	45 to 65
Infant (6 months)	82 to 102	87 to 105	46 to 66	48 to 68
Infant (1 year)	68 to 104	67 to 103	22 to 60	20 to 58
Child (2 years)	71 to 105	70 to 106	27 to 65	25 to 63
Child (7 years)	79 to 113	79 to 115	39 to 77	38 to 78
Adolescent (15 years)	93 to 127	95 to 131	47 to 85	45 to 85

Definition of hypotension by Systolic Blood Pressure and Age

Age	Systolic Blood Pressure (mm Hg)
Term Neonates (0 - 28 days)	< 60
Infants (1 to 12 months)	< 70
Children 1 to 10 years (5th blood pressure percentile)	< 70 + (age in years x2)
Children > 10 years	< 90

D – Disability

- Decrease level of consciousness
- Loss of muscular tone
- Generalized seizures
- Pupil dilation

Glasgow Coma Scale for Adults and Modified Glasgow Coma Scale for Infants and Children				
Response	Adult	Child	Infant	Coded Value
Eye Opening	Spontaneous	Spontaneous	Spontaneous	4
	To Speech	To Speech	To Speech	3
	To Pain	To Pain	To Pain	2
	None	None	None	1
Best Verbal Response	Oriented	Oriented, appropriate	Coos and babbles	5
	Confused	Confused	Irritable, cries	4
	Inappropriate Words	Inappropriate Words	Cries in response to pain	3
	Incomprehensible Sounds	Incomprehensible words or nonspecific sounds	Moans in response to pain	2
	None	None	None	1
Best Motor Response	Obeys	Obeys commands	Moves spontaneously and purposely	6
	Localizes	Localizes painful stimulus	Withdraws in response to touch	5
	Withdraws	Withdraws in response to pain	Withdraws in response to pain	4
	Abnormal Flexion	Flexion in response to pain	Decorticate posturing (abnormal flexion in response to pain)	3
	Extensor response	Extension in response to pain	Decelerate posturing (abnormal extension in response to pain)	2
	None	None	None	1

E – Exposure

- Undress the seriously ill or injured child as necessary to perform a focused physical examination
- Maintain cervical spine precaution when turning any child with a suspected neck or spine injury.
- Look for evidence of trauma such as bleeding, burns, or unusual markings that suggest nonaccidental trauma

Management of Respiratory Emergencies

Respiratory Problems can be categorized into two categories based upon severity

- **Respiratory Distress:** tachypnea, increased respiratory effort, grunting, stridor, wheezing, seesawing or “abdominal” breathing, *head bobbing*
- **Respiratory Failure:** bradypnea, periodic apnea, falling heart rate/bradycardia, diminished air movement, low oxyhemoglobin saturation, stupor, coma, poor muscle tone, cyanosis

Respiratory Problems are categorized into four categories based upon type: Evaluate by observing symmetric chest expansion and by listening for bilateral breath sounds. Breath sounds should be auscultated over the anterior and posterior chest wall and in the axillary areas. Listen for intensity and pitch of sounds.

Upper Airway obstruction:

- Croup, anaphylaxis and foreign body airway obstruction are common causes
- Inspiratory Stridor
- Treatment – treat croup with modified oxygen and nebulized epinephrine, corticosteroids treat anaphylaxis with IM epinephrine or auto injector, albuterol, antihistamines, corticosteroids, aspiration foreign body by allowing position of comfort and specialty consultation.

Lower Airway obstruction:

- Asthma and bronchiolitis are common causes.
- Expiratory wheezes
- Treatment – treat bronchiolitis with nasal suctioning and bronchodilator, treat asthma with albuterol, corticosteroids, SQ epinephrine, magnesium sulfate, terbutaline

Lung Tissue (Parenchymal) disease

- Pneumonia/Pneumonitis and pulmonary edema are common causes
- Treatment – treat pneumonia/pneumonitis with albuterol and antibiotics, treat pulmonary edema with ventilator and vasoactive support, and consider a diuretic

Disordered control of ventilation:

- Increase ICP, Poisoning/overdose, and neuromuscular disease are common causes
- Irregular breathing pattern (“funny breathing”)
- Treatment – treat increased ICP by avoiding hypoxemia, hypercarbia, and hyperthermia, treat poisoning/overdose with antidote and call poison control center, treat neuromuscular disease with ventilator support.

Respiratory Distress

- Tachypnea
- Increased respiratory efforts (eg, nasal flaring, retractions)
- Inadequate respiratory effort (eg, hypoventilation or bradypnea)
- Abnormal airway sounds (eg, stridor, wheezing, grunting)
- Tachycardia
- Pale, cool skin
- Changes in level of consciousness

Respiratory Failure

- Marked tachypnea (early)
- Bradypnea, apnea (late)
- Increased, decreased, or no respiratory efforts
- Poor or absent distal air movement
- Tachycardia (early)

- Bradycardia (late)
- Cyanosis
- Stupor, coma (late)

Airway Devices

Nasopharyngeal Airway – semi – conscious

- Choose size based upon the diameter of the nostril (a 12F or 3mm will generally fit a full term infant)
- For proper length, measure from the nose to the ear
- A shortened E.T. tube may be used

Oral pharyngeal Airway – unconscious

- Choose correct size by measuring from the corner of the mouth to the angle of the jaw.
- Insert while using a tongue depressor to hold the tongue on the floor of the mouth
- It is still necessary to keep the head and neck in the sniffing position after the oral pharyngeal airway is in place
- *Do not suction for more than 10 seconds at a time*

Laryngeal Mask Airway (LMA) – recommended if provider is inexperienced with E.T. tube

Endotracheal Tube – usually the ideal airway in hospitalized patients

- The E.T. tube is placed using a laryngoscope, looking for the triangular vocal cords, and placing the E.T. tube through them.

Determine proper uncuffed size by age / 4+4 (example age 2 / 4 + 4 = 4.5 size)

Determine proper cuff size by age divided by 4 add 3.5

(Note: cuffed tubes should not be inflated to a pressure of >20 cm H2O)

- Intubation attempts should be limited to 30 seconds
- *If bradycardia develops or the clinical condition of the child being intubated deteriorates, interrupt the intubation attempt to provide bag-mask ventilation with 100% oxygen.*
- Insertion of an advanced airway may be deferred until several minutes into the attempted resuscitation, since airway insertion requires an interruption in chest compression for longer than 10 seconds

Methods of Oxygen Delivery

OXYGEN IS THE #1 DRUG - GIVE OXYGEN AS SOON AS IT IS AVAILABLE

Provide oxygen – Room air has 21% oxygen

Low flow Oxygen (<10 L/min) patient inspiratory flow exceeds O2 flow

Nasal Cannula (1 to 4 liters) = increases oxygen by 4% for each liter

Face Mask without reservoirs = increases oxygen by 10% for each liter not recommended to give more than 40 – 60% without reservoir

High flow oxygen (>10 min) O2 flow exceeds patient inspiratory flow

Face Mask with reservoir = ability to provide 100% oxygen

Bag Mask

- Flow – inflating Bags – requires compressed gas source, but can deliver free-flow oxygen at 100%
- Self – inflating – no compressed gas source is required, unable to deliver free-flow oxygen, needs a reservoir to deliver 100% oxygen
- Use positive pressure ventilation with 100% oxygen for children with severe respiratory distress, including significant intercostal retractions
- Always monitor a patient with pulse oximetry
- When possible, monitor with capnography.
- Maintain the arterial oxyhemoglobin saturation >94%. An Oxyhemoglobin saturation of 100% is generally an indication to wean the FiO2

- Pulse oximetry evaluates oxygenation, but not effectiveness of ventilation (elimination of CO₂)
- *Determine effectiveness of bag-mask ventilation by observing for visible chest rise.*

Confirming E.T. Tube placement:

- Mist in the tube
- Auscultation of lungs for bilateral breath sounds
- Auscultation of the gastric area – no gurgling should be heard that would indicate intubation of the esophageal area
- Confirmation with CO₂ detector changing color after six ventilation or Esophageal Detector (now one or the other is required for primary confirmation). Do not use esophageal detector on children less than 20Kg.

Once an advanced airway is in place, there is no need to pause chest compression for ventilations. Provide 100 compressions per minute and 1 breath every 6 – 8 seconds.

If deterioration in respiratory status occurs in an intubated child, use the **DOPE mnemonic**

D – Displacement – especially without cuffs, E.T. tubes in children can become displaced easily and should correct placement should be confirmed each time a child is moved.

O – Obstruction – E.T. tube in children can be very small and easily become occluded

P – Pneumothorax – If breath sounds are diminished on one side, there may be tracheal deviation, O₂ saturation remains low, tachycardia and tachypnea are present, perform immediate needle decompression followed by chest/thoracotomy tube placement.

E – Equipment – always check to make sure that the equipment is functioning properly.

Specific Management of Tension Pneumothorax

- Characterized by the accumulation of air under pressure in the pleural space
- Treatment – immediate needle decompression (18 to 20 gauge) over the top of the child's third rib
- A gush of air is a sign that needle decompression has been successful.

Recognition of Shock

Clinical Signs		Hypovolemic Shock	Distributive Shock	Cardiogenic Shock	Obstructive Shock
A	Patency	Airway open and maintainable / not maintainable			
B	Respiratory Rate	Increased			
	Respiratory Effort	Normal to increased		Labored	
	Breath Sounds	Normal	Normal (crackles)	Crackles, grunting	
C	Systolic Blood Pressure	Compensated Shock → Hypotensive Shock			
	Pulse Pressure	Narrow	Variable	Narrow	
	Heart Rate	Increased			
	Peripheral Pulse Quality	Weak	Bounding or Weak	Weak	
	Skin	Pale, cool	Warm or Cool	Pale, Cool	
	Capillary Refill	Delayed	Variable	Delayed	
	Urine Output	Decreased			
D	Level of Consciousness	Irritable (early)		Lethargic (Late)	
E	Temperature	Variable			

Key Points:

Capillary refill, if prolonged (>2 seconds), may indicate shock, measure blood pressure early. Shock is defined as inadequate delivery of oxygen and nutrients to the tissues relative to tissue metabolic demand.

Shock can be categorized into two categories based upon severity:

- Compensated Shock: Normal systolic BP, decreased level of consciousness, cool extremities with delayed capillary refill, and faint or non-palpable distal pulses
- Hypotensive Shock: Hypotension with signs of shock

*** For children ages 1 to 10 years of age, hypotension is defined as systolic BP <70 mm Hg + (child's age in years x2) mm Hg ***

Types of Shock	Volume of Fluid	Approximate Rate of Delivery
Hypovolemic Shock (non-DKA) Distributive Shock	20 ml/kg bolus (repeat PRN)	Over 5 to 10 minutes
Cardiogenic Shock (nonpoisoning)	5 to 10 ml/kg bolus (repeat PRN)	Over 10 to 20 minutes
DKA with compensated shock	10 to 20 ml/kg	Over 1 hour
Poisonings (eg, calcium channel blocker or B-adrenergic blocker)	5 to 10 ml/kg bolus (repeat PRN)	Over 10 to 20 minutes

Resuscitation Team Concept

Eight Elements of Effective Team Dynamics

1. Closed-loop communication
2. Clear Messages
3. Clear Role and responsibilities
4. Knowing one's limitations
5. Knowledge sharing
6. Constructive intervention
7. Reevaluation and summarizing
8. Mutual respect

Six Resuscitation Team Roles

1. Team Leader
2. Airway
3. IV/IO
4. Compressor
5. Monitor/defibrillator
6. Observer/Recorder

Algorithms

In contrast with cardiac arrest in adults, cardiopulmonary arrest in infants and children is rarely sudden and is more often caused by progression respiratory distress and failure or shock than by primary cardiac arrhythmias. Therefore, oxygen is the number one treatment of most pediatric conditions.

Most (not all) algorithms can be treated by following the ONE mnemonic – and then adding special considerations:

O – Oxygen
N – Normal Saline
E – Epinephrine

Differential Diagnosis – H's and T's

“Thinking it Through” Unless the cause of an arrhythmia is correctly identified, it will be impossible to treat. A hypovolemic person in PEA will not be helped by all of the epinephrine in the world. H's and T's are essential to nearly every Algorithm.

- Hypovolemia – give fluids
- Hypoxia – given oxygen, check E.T. tube
- Hydrogen ion (acidosis) – Sodium bicarbonate
- Hypo-/Hyperkalemia – potassium or sodium bicarb
- Hypoglycemia – Glucose
- Toxins – Drug overdose = given Narcan
- Tamponade, cardiac – pericardiocentesis
- Tension Pneumothorax – needle decompression
- Thrombosis, Coronary
- Thrombosis, Pulmonary

Pulseless Arrest

Pulseless Arrest includes:

1. Ventricular Fibrillation and pulseless ventricular tachycardia
2. Asystole and pulseless electrical activities

V-Fib and Pulseless VT are shockable
Asystole and PEA ARE NOT shockable

If shockable (v-fib and pulseless VT):

Defibrillation can be performed using either monophasic or biphasic technology. Biphasic, the newer technology uses about ½ the energy of a monophasic shock.

First shock is at 2J/kg, subsequent shocks are 4J/kg max 10J/kg

Monophasic – maximum 360 J

Biphasic – Maximum 150 J to 200 J

*** Note: 1st shock may be 2 – 4 J/Kg, 2nd shock 4J/kg, may continue to increase to a maximum of 10J/kg or maximum adult dose ***

The first shock eliminates VF more than 85% of the time.

- Steps for defibrillation:
 1. When the AED or defibrillator arrives, turn it on
 2. Select energy level
 3. Position appropriate pads or electrodes (apply conductive paste if using paddles)
 - a. Paddle size – Infant size for <1 yr. or <10 kg
Adult size for >1 yr. or >10 kg
 4. Analyze the rhythm (do not touch the victim during this phase) if the rhythm is V-Fib or pulseless VT (or if the AED recommends a shock), prepare for shock
 5. Prepare to shock by selecting the appropriate number of Joules and selecting defibrillate mode
 6. Press the charge button – announce that you are doing this – continue CPR while charging
 7. Clear: I'm clear (you are not touching the patient or bed), You're Clear – includes making sure that the oxygen is away from the patient, Everybody's clear (no one is touching patient, or bed)
 8. Press the shock button and wait for shock discharge
- **Immediately following the shock, resume CPR starting with chest compressions. (DO NOT CHECK FOR PULSE AT THIS POINT)**
- Perform CPR 5 cycles 30:2 with one person or 2 minutes of CPR 15:2 with 2 people.
- After 2 minutes of CPR, stop compression just long enough to check the rhythm and check for pulse **(NEVER STOP CHEST COMPRESSION LONGER THEN 10 SECONDS)**
- If another shock is needed, prepare to shock, but continue CPR while the defibrillator is charging
- Repeat this sequence until the rhythm is not shockable

Reason for CPR immediately after the shock:

- If the first shock fails, CPR will circulate the blood and bring more oxygen to the heart, making a subsequent shock more likely to be successful
- Even when a shock eliminates VF, it often takes several minutes for a normal heart rhythm to return and more time for the heart to create blood flow. Chest compressions can deliver oxygen and sources of energy to the heart, increasing the likelihood that the heart will be able to effectively pump blood after the shock.

During delivery should not interrupt CPR. The time of the drug is less important than minimizing interruptions in chest compressions.

If a patient is in sustained asystole for 15 minutes, it may be reasonable to consult the family and consider calling the code.

Bradycardia

1. Oxygen first **
2. CPR if HR is < 60 bpm
3. Epinephrine 0.01mg/kg IV/IO (1:10,000; 0.1ml/kg) is the first drug of choice for bradycardia in children
4. Atropine 0.02 mg/kg IV/IO (Minimum dose: 0.1mg; maximum total dose for children: 1mg) may be given. Small doses of atropine may cause paradoxical bradycardia in small doses which is why epinephrine is

generally used. However, atropine may be used if bradycardia is due to increased vagal tone or primary AV block.

If there is a high level of heart block (usually due to congenital condition), consider **transcutaneous pacing**.

Tachycardia with Pulse and Adequate or Poor Perfusion

#1 Question – Stable vs. Unstable

- Stable – Vagal and/or Medication
Narrow QRS Regular Rhythm
Supraventricular Tachycardia
 1. Try Vagal maneuvers
 2. Adenosine 0.1mg/kg (maximum doses 6mg, 2nd dose 12mg) RAPID IVP (2 syringe technique)
Note: A brief period of asystole may follow the injection

WIDE QRS (VT with pulse)

- Amiodarone 5mg/kg IV over 20 to 60 minutes
- Or Procainamide 15mg/kg IV over 30 to 60 minutes
- May need synchronized Cardioversion

WIDE QRS (torsades de points)

- Magnesium load with 25 – 50 mg/kg over 10 minutes

UNSTABLE (WITH PULSE) = SYNCRONIZED CARDIOVERSION

Prepare for IMMEDIATE cardioversion. While preparing, you may try an appropriate medication (Adenosine or Amiodarone) if there is time. Also, sedate the patient if possible.

Use 0.5 to 1J/kg up to 2J/kg monophasic, depending upon the acuity of the patient (or a clinically equivalent biphasic energy dose. Optimal biphasic doses have not yet been established with certainty.

- Steps for cardioversion:
 1. Consider sedation
 2. Turn on defibrillation
 3. Attach monitor leads to patient
 4. Press “SYNC” mode button
 5. Look for markers on R wave indicating sync mode
 6. Select appropriate energy level
 7. Position appropriate pads or paddles
 8. Press the charge button – announce that you are doing this
 9. Clear: I’m clear, you’re clear – includes making sure that the oxygen is away from the patient. Everybody’s clear
 10. Press the shock button and wait for shock discharge (this may take a few seconds while the machine looks for R waves and determines where the sync the shock”
 11. Analyze the rhythm again. If still in tachycardia, increase the joules and try again.

Note: Reset the sync mode after each synchronized cardioversion because most defibrillators default back to unsynchronized mode.

Hypothermia - The 2010 guidelines emphasize that induced hypothermia (32C to 34C) for 12 to 24 hours for patients who remain comatose after resuscitation from cardiac arrest may be beneficial for adolescents and may also be considered for infants and children.